Emissions Reduction Plan Feedback

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Prepared by Zero Waste Network, Para Kore and The Rubbish Trip

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About us

The Zero Waste Network Aotearoa NZ

The Zero Waste Network is a membership organisation with 120+ members across the country who work towards Zero Waste with their local community. 61 of these are full members providing practical resource recovery and behaviour change services. One of these members is Para Kore which is a network in its own right.

Our members employ 1200+ people who work in resource recovery and environmental education. Collectively we recover 32,000+ tonnes of material each year and feed $73+ million dollars back into local economies through our enterprises.

Our mission is to:

- connect and empower a network of zero waste community enterprises across Aotearoa
- inform policy and procurement
- trial and deliver zero waste solutions

The Zero Waste Network is based in Auckland and Wellington with board members spread across Aotearoa.

For more info: https://zerowaste.co.nz

Para Kore Marae Incorporated

He mea whakatū a Para Kore i te tau 2010, he hinonga monihua-kore, ko te hononga whakapapa ki a Papatūānuku tōna mātāpono matua. Established in 2010, Para Kore is a Māori, not-for-profit organisation with a kaupapa based on whakapapa to Papatūānuku. E whakapono mātou ki te kōtuituitanga o te rangatiratanga o te iwi Māori, te oranga o te whānau me te oranga o te taiao. Ko te pae tawhiti e whāia ana kia tata: Oranga Taiao, Oranga Marae, Oranga Whānau. We believe that rangatiratanga Māori (self-determination) the wellbeing of whānau and the wellbeing of the natural world are interconnected. He tautōhito, he whai pūkenga tō mātou tira mahi e tuku ana i ngā akoranga o Para Kore ki ngā marae me ngā rōpū maha o tēnā rohe, o tēnā rohe, huri i te motu. Our work is expressed through an experienced and skilled team who work regionally delivering the Para Kore education programme to marae and rōpū. The rōpū we work with include but are not limited to: marae, whānau, hapū, iwi, kura, kōhanga reo, puna reo, kindergarten, community organisations, events, churches, tertiary institutions, companies, government departments, community gardens, and kaumātua rōpū.

For more info: https://www.parakore.maori.nz/

The Rubbish Trip

The Rubbish Trip is a project run by Hannah Blumhardt and Liam Prince supporting New Zealanders to reduce their household waste. We give talks and presentations on the whys and hows of zero waste living, having lived without a rubbish bin since the beginning of 2015. We travelled nonstop throughout Aotearoa from July 2017 until March 2020, delivering 400+ presentations to nearly 20,000 people from Kaitāia to Rakiura/Stewart Island. Now based in Wellington, we continue to support individuals to reduce their waste footprint while also engaging more long-term in Wellington-based community initiatives and in continuing to advocate for systemic change through academic, civil society and social enterprise channels.

Meeting the net zero challenge

Transition Pathway

1. Do you agree that the emissions reduction plan should be guided by a set of principles? If so, are the five principles set out above the correct ones? Please explain why or why not.

Yes the Emissions Reduction Plan should be guided by a set of principles.

We would prefer to see the eight principles put forward by the Climate Commission in their advice to the Government: Inaia-Tonu-Nei: a low emissions future for Aotearoa[1] used to guide the transition. They have already been consulted on, were distilled from the considerations of the Zero Carbon Act, and cover a broader range of points than the five included in the ERP discussion document.

Upholding Te Tiriti o Waitangi is a statutory obligation that should sit above any other principles. Including this in the general list of principles gives the impression it is one of a number of priorities rather than a primary statutory responsibility. By way of comparison, the Infrastructure Commission's Draft strategy[2] places Te Ao Māori, which includes both partnership and opportunities as an overarching priority.

Climate Commission principles	**Draft ERP principles**
Te Tiriti o Waitangi Partnership is an overarching statutory obligation	
1. Transition in an equitable and inclusive way 2. Take a long term view to 2050 and beyond 3. Prioritise gross emissions reductions 4. Create options and manage uncertainty 5. Take a systems view 6. Avoid unnecessary cost 7. Increase resilience and manage risks 8. Leverage co-benefits	1. A fair, equitable and inclusive transition 2. Evidence based approach 3. Environmental and social benefits beyond emissions reductions 4. *Upholding Te Tiriti o Waitangi* 5. A clear, ambitious and affordable path

If the current principles list is retained:

[1] p71-72
[2] P15 Draft New Zealand Infrastructure Strategy Infrastructure Commission October 2021

- #2 Expand Evidence-based to Broad evidence base
  This recognises the importance of diversity, multiple worldviews, the value of practical experience and local knowledge, qualitative analysis, alongside quantitative data etc.
- #3 would make more sense if it referred to the shift to a circular economy including the Waste hierarchy, zero waste as this is seen as a key element of the transition.

The principles as written are a bit of a grab bag and would need more work if they are to be used:

- They don't align well with the summary version described in Figure 2 (p.18) talks about *empowering* government, iwi/Māori, communities, and business, and Table 5 (Fair, equitable and inclusive transition section) takes a negative approach detailing what will be avoided and minimised. This sends the opposite message.
- They don't align well with the description of the transition pathway on p.19-20 which has a strong focus on economic factors.
- There is no mention of the key principles that underpin a shift to a circular economy - Waste hierarchy, zero waste although this is seen as a key element of the transition.
- They understate the scale of response required eg. Fair equitable and inclusive transition the phrase 'opportunities for ***affected*** regions' etc makes it seem like climate change will only affect some people and parts of the country. Climate change will affect us all.
- There is no guidance on how the principles will be used to inform decision making. It is not clear where they would fit on Fig 2. 'Aotearoa New Zealand's pathway to Carbon Zero'.

UNEP[3] have developed 10 principles for sustainable infrastructure it may be worth mapping these against the ones you have to see if they can add any value. There are commonalities and obvious differences. #5 'Resource Efficiency and Circularity' speaks to us.

We note that the ERP contains a cross-cutting section on circular economy. A zero waste approach underpinned by a legislative requirement to use the Waste Hierarchy to prioritise action is the key to turning circular economy principles into action. Adding a principle that addresses Resource efficiency and circularity could encompass #3 on the Climate Commission's list: 'Prioritise gross emissions reductions'.

UNEP's list:

1. Strategic planning
2. Responsible , resilient and flexible service provision
3. Comprehensive life cycle assessment of sustainability
4. Avoiding environmental impacts of infrastructure systems
5. **Resource Efficiency and Circularity**
6. Equity, Inclusiveness and Empowerment
7. Enhancing economic benefits
8. Fiscal sustainability and innovative financing
9. Transparent inclusive and participatory decision making

[3] UNEP 2021 International Principles for Sustainable Infrastructure Nairobi

10. Evidence based decision making

Key concepts that we do not think have been adequately reflected in the principles as written include:

- **Equitable transition** - leave no-one behind, transformation creates opportunities and capability that generates the conditions in which equity flourishes. Co benefits are a key part of making the best use of what we have got. The process of shifting to a low carbon circular economy creates an opportunity to do things differently. It is important that no-one gets left behind.
- **Resilience**[4] - in natural, social and economic ecosystems - Active protection of critical systems ensures resilience. Environmental quality: land, air, water, ecosystems. Community: social cohesion, cultural competency in mutually beneficial relationships, shared purpose. Democracy: participation and partnering models ensure personal freedom and political voice. Local Economies: diverse supply market, local multiplier effect, strong networks., short supply chains. In this time of radical uncertainty the Emission Reduction Plan needs to protect our way of life and the systems that underpin it to create a safe space for radical innovation.
- **Regeneration** - of natural, social, human and economic capital - Value flows from the capitals that underpins the 'economy'. Shifting from an extractive, linear approach to a regenerative, circular approach requires a focus on creating rather than extracting value[5]. Natural ecosystems, communities, capacity and local economies need to be continually renewed. The Emission Reduction Plan needs to enable positive feedback loops between systems and processes that grow all forms of capital.
- **Circular economy** - zero carbon, zero waste - reduce emissions, slow down material and product flows, design out waste and pollution, meet needs through new provision of service models, effective product stewardship ensures collaboration across the supply and recovery chain to create value chains. The Emission Reduction Plan needs to actively support the shift to new models of doing business and creating value.

2. How can we enable further private sector action to reduce emissions and help achieve a productive, sustainable and inclusive economy? In particular, what key barriers could we remove to support decarbonisation?

N/A

3. In addition to the actions already committed to and the proposed actions in this document, what further measures could be used to help close the gap?

[4] Karacaoglu 2021 op cit sees systemic resilience as a critical output of public policy. "Investing in resilience provides the bridge to achieving sustainable intergenerational wellbeing in a world of fundamental uncertainty." p29

[5] Mazzucato 2021 Mission Economy a moon shot guide to changing capitalism. argues that aligning business, government and civil society behind shared goals or missions will shift our economy to a different form of capitalism that focuses on creating rather than extracting value.

N/A

4. How can the emissions reduction plan promote nature-based solutions that are good for both climate and biodiversity?

The emissions reduction plan is currently missing the opportunity to take a regenerative and circular approach to addressing the problem of biogenic methane from organic waste in landfill. The Government has the potential to generate huge co-benefits for climate and biodiversity by giving primacy to nature-based solutions to organic waste in landfill. Namely, using this organic 'waste' to build up soil.

Soil is almost completely ignored in this consultation document, despite soil being one of the most critical foundations for healthy biodiversity and ecosystems and thus at the core of any nature-based solution. In 2015 the UN Food and Agriculture Organisation estimated that we had 60 years of topsoil left on a global scale.[6] If we don't make changes, by 2050 we will have lost 75% less arable land available per person compared to 1960[7]. Healthy soil absorbs carbon, filters water and supports life. Degraded soils lose the ability to provide these services. Eventually they can lose the ability to support life altogether and become deserts.

We depend on healthy soils for the food we eat, for around 70% of the material inputs to our industrial systems (critical for a thriving bioeconomy), and for the biodiversity that supports life on our planet. The health and productivity of topsoil is a critical issue for our primary industries. Each year, Aotearoa loses 720 tonnes of soil per square kilometre or 192 million tonnes total, 44% of which comes from exotic grassland, which reduces our land's productivity and harms aquatic ecosystems.[8] Soil is probably NZs largest export at a negative premium for future generations to repay.

We need to feed as much organic material back into soil through high quality composting as possible.

This will help to replace the organic material used to grow food and fibre in the first place. It will offset use of synthetic nitrogen fertilisers, restore and regenerate soil life, depth, structure, organic content and fertility. Collecting, composting and returning high quality organics to farms and horticultural blocks will support regenerative farming practises. These approaches should form the backbone of the bioeconomy (see our answers to those questions).

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[6] Food and Agriculture Organisation of the United Nations (2015) *Status of the World's Soil Resources* (Rome: FAO). http://www.fao.org/documents/card/en/c/c6814873-efc3-41db-b7d3-2081a10ede50/.

[7] Due to population growth and soil loss and degradation see FAO paper for detail

[8] StatsNZ (April 2018). 'Estimated Long Term Soil Erosion.' *Indicators*: https://www.stats.govt.nz/indicators/estimated-long-term-soil-erosion; Environment Aotearoa 2019. 'Theme 2: How we use our land.' https://environment.govt.nz/publications/environment-aotearoa-2019/theme-2-how-we-use-our-land/ NZ Govt Data 2019 - Evidence for Well being budget priorities

It also creates connections across the food supply and recovery chain as consumers become better connected to the people and places their food comes from. High quality composting systems depend on source separation. People have a strong incentive to get it right when they know the compost is going back onto the farms and gardens their food is grown on.

UNEP[9] prioritises investing in nature to complement or strengthen its ability to provide services as well as its intrinsic value. Urban and regenerative farming build the capacity of soils to support life, increasing net biodiversity. We therefore see an integrated cross-sector approach to organic waste management, agriculture and urban development within the bioeconomy as a critical nature-based solution.

5. Are there any other views you wish to share in relation to the Transition Pathway?

N/A

Helping sectors adapt

6. Which actions to reduce emissions can also best improve our ability to adapt to the effects of climate change?

The key climate change risks summarised on p.24 have missed critical issues we may face in the near future. Supply chain disruptions are already occurring and are likely to become far worse with climate uncertainty, increasing our vulnerability with relying on importing raw materials, products and food.

The agriculture risks identified acknowledge the likely impact of extreme weather and other climatic factors on productivity and profitability of the sector rather than the far more worrisome potential disruptions to food security. We need to focus on actions that grow local resilience and security for base level infrastructure such as food, water and housing.

Empowering and supporting localised, resourceful and innovative community-led solutions may be our best chance to build resilience and security against the effects of climate change, and to enhance social, environment and local economic wellbeing. An essential part of this approach will be empowering and resourcing hapū and iwi to exercise tino rangatiratanga within their rohe.

7. Which actions to reduce emissions could increase future risks and impacts of climate change, and therefore need to be avoided?

We must recognise that excessive resource and energy extraction and consumption are core drivers of climate change. Our actions need to focus on shifting from an extractive linear economy to a regenerative circular economy that drives down reliance on raw material consumption. In

[9] Principle 4 - UNEP 2021 International good practise principles for sustainable infrastructure Nairobi

order to adopt actions that target the full spectrum of emissions we need to account for lifecycle consumption-based emissions of the products and resources that flow through our economy.

All proposed actions must be filtered through this lens - for example, what are the upstream and downstream effects of building new infrastructure? Can we change the way we do things to avoid having to build new stuff (e.g. moving around differently so fewer roads need to be built and maintained, designing out waste so that large materials recovery facilities are not needed)? How do we make do with what we already have? How do we transition to new, green technology that is shared rather than individually owned to reduce material consumption (e.g. EV car-sharing and public transport, rather than private car ownership).

While there may be a need and a place for some large-scale centralised initiatives to help us achieve large emissions reductions, the vulnerability and negative externalities of large infrastructure must be recognised and weighed up against decentralised, local-scale initiatives and the range of wellbeing measures they address.

We are also concerned that the current thinking on the bioeconomy in the discussion document follows a linear, rather than a circular model, because it is predicated on the ongoing creation of waste biomass. In the same way that extracting inorganic materials through mining damages and destroys ecosystems, creates political instability and reduces resilience, the destruction of arable land means moving food production activity into more marginal land which has the same impacts. The bioeconomy and the industries that provide its feedstocks may perpetuate rather than challenge this extractive approach.

Working with our Tiriti partners

8. The Climate Change Commission has recommended that the Government and iwi/Māori partner on a series of national plans and strategies to decarbonise our economy. Which, if any, of the strategies listed are a particular priority for your whānau, hapū or iwi and why is this?

This submission does not represent a whānau, a hapū or an iwi. We do however assert and support the importance of the Crown - Māori partnership across all plans and strategies.

We expect the Government to work with iwi and hapū to co-design and implement new policy settings and measures that have a dual outcome of working to reduce emissions while at the same time addresses current [historical] inequities. We support the design of policy being cognisant of existing social disparities between communities and nuanced to avoid a one-size-fits all approach across the motu.

9. What actions should a Māori-led transition strategy prioritise? What impact do you think these actions will have for Māori generally or for our emission reduction targets? What impact will these actions have for you?

We support the general approach outlined in this consultation document to ensure Te Tiriti is upheld when it comes to climate action. As the document articulates, this will require not only strong, lasting and binding strategies developed in partnership between Government and Māori, but must also include redistribution of decision-making power and resources for hapū and iwi to exercise rangatiratanga and uphold kaitiakitanga. These actions uphold Te Tiriti and recognise the impacts of colonisation through dispossession of Māori from their lands, waters, resources and ecosystems. Furthermore, a Tiriti-compliant approach will empower local-scale, hapū- and iwi-led initiatives that are essential to reduce emissions and grow social, cultural, environmental and economic resilience and wellbeing. For these reasons we also agree that this mahi should complement the Equitable Transitions Strategy.

Aotearoa environmental policy generally fails to acknowledge the deep value encompassed by mātauranga Māori. This immeasurably valuable resource would become available to all of Aotearoa if the Crown upheld its constitutional obligations. Principles of kaitiakitanga, tikanga, mātauranga and other cultural elements could then be used to provide powerful, tested and trusted responses to environmental issues.

10. What would help your whānau, community, Māori collective or business to participate in the development of the strategy?

We endorse the establishment of a Crown-Māori national agency responsible for Oranga Taiao. This would statutorily ensure that the level of power-sharing and partnership upholds Te Tiriti o Waitangi. This proposed statutory agency would be mandated to operationalise all relevant environmental legislation, strategy reviews, and reform.

The existence of a Crown-Māori agency would return sovereignty and resource hapū and local communities both as a matter of necessity and redistributive justice, to those who hold knowledge critical to ensuring a positive outcome for te taiao. Resources would be directed towards supporting Māori communities in reclaiming and redeveloping the most effective and appropriate kaitiakitanga practices.

A partnership approach would ensure communications to whānau, hapū and iwi were on-point - clear and readily received without Wellington jargon. A partnership approach would allow for ‘wānanga’, a space for opinions and knowledge to be aired and shared, allowing whānau to determine their pathways. A partnership approach would allow for tikanga. There are many by Māori, for Māori organisations like Para Kore who may be able to support the transition or transformation to net-zero carbon.

11. What information would your Māori collective, community or business like to capture in an emissions profile? Could this information support emissions reductions at a whānau level?

In our work with whānau, hapū, iwi and Māori communities we see poverty. As Community and as Māori we are connected to our people and our places. Our emissions profile must also be about

eradicating poverty - and with a top of the waste hierarchy approach (reduce - reuse) this eradication of poverty does not need to entail 'more' with reuse it can be 'less'. The well-being of whānau and the well-being of Papatūānuku and Ranginui are interconnected.

12. Reflecting on the Commission's recommendation for a mechanism that would build strong Te Tiriti partnerships, what existing models of partnership are you aware of that have resulted in good outcomes for Māori? Why were they effective?

The zero waste sector in Aotearoa is attempting to model how Te Tiriti can be honoured in practice. Our organisations, Para Kore and Zero Waste Network, represent a wide range of community enterprises and initiatives, led by both tangata tiriti and tangata whenua. Upholding Te Tiriti is a core principle of our organisation, and we seek to include Māori perspectives and mātauranga in all the work we do. We know that this will be ongoing and we can always do better.

Together we are already working on what a zero waste, zero carbon, circular and Tiriti-based Aotearoa might look like. This includes practical ideas like a National Resource Recovery Network built on a partnership between Crown and Māori, which has the potential to benefit all New Zealanders. Regenerating Papatūānuku, and Tangaroa, holds the potential to preserve our identity as New Zealanders and galvanise us collectively towards our goals.

However, we recognise that our organisation operates in the 'relational sphere', where partnership between Pākehā and Māori organisations is developed. While we support and advocate for our members to navigate the 'kāwanatanga sphere' (e.g. within our Western laws, norms, values and institutions), we recognise there is a need to strengthen the 'rangatiratanga sphere' where hapū and iwi can make independent decisions by and for Māori without influence or conditions, and be adequately resourced to implement those decisions. We advocate for this approach to local and central government, while constantly building our relationships with groups like Para Kore, as well as with mana whenua in the locations our members work in.

We recommend the Government refer to the recent Policy Quarterly article about ensuring a tika transition through environmental policy (which includes case studies): Bargh and Tapsell (2021) 'For a Tika Transition: strengthen rangatiratanga.' Policy Quarterly 17(3). Accessible at https://ojs.victoria.ac.nz/pq/article/view/7126

Making an equitable transition

13. Do you agree with the objectives for an Equitable Transitions Strategy as set out by the Climate Change Commission? What additional objectives should be included?

The objectives are good, but the process needs more work urgently. We support the comments on an equitable transition by the Community Energy Network in their submission, in particular that government should urgently adopt a robust framework for equitable transition well prior to 2024.

We can look to international examples for guidance, such as the work of Scotland's Just Transitions Commission.

14. What additional measures are needed to give effect to the objectives noted by the Climate Change Commission, and any other objectives that you think should be included in an Equitable Transitions Strategy?

The Commission suggests that the Equitable Transitions Strategy should be co-designed alongside iwi/Māori, local government, regional economic development agencies, businesses, workers, unions, the disability community and community groups.

15. What models and approaches should be used in developing an Equitable Transitions Strategy to ensure that it incorporates and effectively responds to the perspectives and priorities of different groups?

Government needs to work in a different way

Good practise in Public Management changes over time. The emerging wellbeing approach is shifting us towards a more integrated and proactive systems approach for government. Focusing on wellbeing outcomes extends the time horizon for decision making. The intervention focus is on building capability and creating opportunities that enable people to 'live lives they have reason to value'[10]. The transition to a zero carbon, zero waste circular economy needs to enable ecosystems, people and local and regional economies to flourish.

	Public administration	New Public Management	Emerging wellbeing approach
Aim	Welfare	Welfare	Well being
Measurement	Input focus	Output focus	Outcome focus
Structure	Silo based	Silo based	Horizontal Integration (Whole of Govt)
Management	Command and control	Command and control	Vertical Integration (Localism)
Service approach	Professional	Managerial	Participation
Interventions	Universal care services and welfare for those in need	Universal care services and welfare for those in need	Universal care services and support for those at risk (prevention)

Wallace 2019 cited in Girol Karacaoglu (2021). *Love You - Public Policy for Intergenerational Wellbeing*. Tuwhiri Project p130

[10] Wallace 2019 cited in Girol Karacaoglu (2021). *Love You - Public Policy for Intergenerational Wellbeing*. Tuwhiri Project p130

Key features of this approach need to be carried forward into the Emission Reduction Plan. The ERP vision acknowledges that the transition is a means to deliver wellbeing through a focus on outcomes, rather than as an end in and of itself.

The idea of centralisation speaks to the need for horizontal integration across the whole of government around purpose, framing, procurement and outcomes sought. Localism speaks to the need to ensure opportunities and capability building are decentralised to build Māori and Pasifika enterprise, community resilience and revitalise local and regional economies.

Participation speaks to partnership, engagement, social procurement, the intentional design of processes to build long term relationships based around common goals and the ability of communities to solve their own problems through collective action.

Well being and the equitable transition

The Government is already some way along this road. The wellbeing budget process looks beyond simple GDP growth to the indicators of wellbeing we used to hope this growth would deliver to us. The basic idea is that deliberately investing to achieve the outcomes we want is a more direct path than hoping the economy will deliver them by happy accident[11].

Economist Girol Karacaoglu[12] explains that the intention of a wellbeing approach is to enable and empower people and communities to look after themselves, by investing strategically to increase resilience and wellbeing across the board. The emerging wellbeing approach underpins the big change processes going on across government which includes the work being done across the board through the Emissions Reduction Plan (and the Future Adaptation Plan.)

One of the five wellbeing budget priorities has particular relevance to the ERP: "*Just Transition - supporting New Zealanders in the transition to a climate-resilient, sustainable, and low emissions economy.*" This wellbeing approach has flowed through into the Government procurement rules which shape a process for creating public value by using procurement to deliver broader outcomes. One of the four priorities being to *"support the transition to a zero net emissions economy and assist the Government to meet its goal of significant reduction in waste."*

It is clear that reducing waste and emissions and making a transition to a resilient, inclusive and sustainable economy are things we value as a society. The question is how to harness our collective power to deliver them. The Equitable Transitions Strategy is a key piece of the puzzle.

Karacaoglu (2021)[13] identifies two critical wellbeing priorities for Aotearoa: stresses on our natural environment and equity issues. It is vital that the Equitable transitions strategy clearly

[11] The idea that benefits from growth will 'trickle down' has been questioned since the 1970s. Recent evidence on inequality and externalities/spillovers shows that it tends to work the other way around.
[12] Girol Karacaoglu (2021). *Love You - Public Policy for Intergenerational Wellbeing.* Tuwhiri Project. p33 p130
[13] OP Cit

describes how the decision making principles will generate actions that create the conditions for these types of wellbeing to flourish.

Other actions

16. How can Government further support households (particularly low-income households) to reduce their emissions footprint?

Many simple, practical solutions to support households to reduce emissions already exist, and Government could put resources into supporting such initiatives. For example, initiatives to help households prevent and compost food waste (nearly half of what fills the average rubbish bin in Aotearoa) could be ramped up. Many landlords do not allow composting unless it is in a rat proof container, which can be costly (around $300) - subsidising bins and investing in mentorship schemes would help. Investing in and subsidising composting and local food enterprises could also support such changes while providing local employment.

However, the Government must recognise and act on the systemic barriers that prevent households from being able to take action. Investments and subsidies are needed for low-emissions goods and services to increase their accessibility and affordability - things like public transport or ride sharing schemes, energy efficient homes and home appliances, fresh kai grown locally and regeneratively/organically, essential groceries without packaging or in reusable packaging, and high quality secondhand or durable and repairable items (and the maintenance/repair services that extend the life of these products).

Ultimately, Government must recognise that the consumption patterns of wealthy citizens contribute far more than their fair share of emissions.[14] Targeting excessive consumption must be the priority and the burden of responsibility must not be placed on low-income households who have a comparatively small environmental impact to wealthy households.

17. How can Government further support workers at threat of displacement to develop new skills and find good jobs with minimal disruption?

The transition to a low emissions economy will see some industries and jobs wind down. But reducing our reliance on resource extraction to power our economy will create more localised, people-powered jobs. That means remembering and rekindling olds skills, and strengthening new ones - from growing kai and composting, to repairing and collaborating, systems change, reverse logistics, design and recycling.

These skills are just as important as the hard physical assets that sit alongside. They must be built into the transformation of the vocational training system as well as integrated into educational curricula and training across the board. Countries like Scotland have already started to consider

[14] Thomas Wiedmann et al. (2020). 'Scientists' warning on affluence.' *Nature Communications,* Volume 11, Article number: 3107. https://www.nature.com/articles/s41467-020-16941-y

employment and skills pathways for a circular economy.[15]

We need transformative policy, regulation and investment to favour circular, local-scale business models and build the capacity, skill and knowledge base for the transition from a linear, extractive and exploitative world to a regenerative, circular and equitable world. Investing in building the institutional, human and social capital required to change the ways we behave in all our roles needs to be a key priority.

Funds should also be invested to develop a network of local-scale resource recovery and behaviour change hubs - to reduce consumption emissions by encouraging local reuse, repair, circular economy behaviours and connection. Building up networks of local behaviour change expertise will be critical to supporting communities to embrace change during the transition to a low carbon, low waste economy. This network of hubs will also provide a supportive ecosystem for local circular business models and innovations.

18. What additional resources, tools and information are needed to support community transition planning?

N/A

19. How could the uptake of low-emissions business models and production methods be best encouraged?

There are many small-scale, niche circular business models already in operation across Aotearoa. They focus on things like sharing rather than ownership models, reusable or zero packaging systems and local regenerative food production. Uptake of these business models is difficult and unattractive because the set-up costs are often high, and the surrounding system infrastructure is geared towards linear business models rather than circular ones, so the playing field is not level. Furthermore, finance and funding pools tend to favour material innovation, discreet projects, large-scale, one-hit impact, and cap-ex costs.

If the Government wishes to see greater uptake of circular business models, and help make low carbon circular goods and services more accessible and affordable for all, it must change the rules of the game to level the playing field to favour circularity rather than linear activity:[16]

> Regulatory, financial and economic instruments are needed to transition to the circular economy. It is crucial to set the right policy and regulatory frameworks in place at all levels…. It is important to correct misleading incentives, remove harmful subsidies and count environmental externalities in the pricing.

[15] Zero Waste Scotland and Circle Economy (2021) The Future of Work: Baseline Employment Analysis and Skills Pathways for the Circular Economy. Accessible at https://www.zerowastescotland.org.uk/content/future-work.
[16] OECD Urban Studies (2020) "The role of national governments in supporting the transition to a circular economy" in The Circular Economy in Cities and Regions: Synthesis Report. Accessible at https://www.oecd-ilibrary.org/sites/724e5c45-en/index.html?itemId=/content/component/724e5c45-en#section-d1e22491.

Funding systems also need to be adapted to recognise that many circular business models operating at the top of the waste hierarchy involve system innovation rather than material innovation (e.g. setting up a grocery store with bulk bins and reusable packaging rather than developing a line of compostable plastic packaging). Most require support with ongoing operational costs to compete with linear business models. Given circular innovation tends to require collaboration across the system, it can be difficult to prove impact as an individual actor and generally innovators have to start small to test the model.

There needs to be a greater and more accessible pool of funds available for small-scale niche innovators who are delivering system innovation to reduce waste and emissions. As well as grants, a localised social procurement model would help give small innovators reliable and substantial custom. While it is difficult for central and local government agencies to manage multiple small contracts, this inflexibility does disadvantage small, local enterprises. A social procurement approach would make a big difference.

20. Is there anything else you wish to share in relation to making an equitable transition?

N/A

Meeting the net zero challenge

Government accountability and coordination

21. In addition to the Climate Change Commission monitoring and reporting on progress, what other measures are needed to ensure government is held accountable?

Alongside concrete emissions reductions, Government must be held accountable for its progress on an equitable transition and adherence to Te Tiriti o Waitangi. An equitable transition that ensures wider social, economic and environmental outcomes are being met alongside emissions reductions may require new governance frameworks focused on holistic wellbeing (see question 15).

As we have outlined in the previous sections, the Equitable Transitions Strategy must be Tiriti-based. The Government must work with iwi and hapū to co-design and implement new policy settings and measures that are cognisant of existing social disparities between communities and nuanced to avoid a one-size-fits-all approach across the motu. This should be universally supported by iwi and hapū.

We would support empowering or establishing dedicated independent organisations, alongside the Climate Change Commission, to monitor and report on progress in these areas (e.g. Climate change Iwi Leaders Group/Iwi Chairs Forum, NZCTU).

22. How can new ways of working together, like mission-oriented innovation, help meet our ambitious goals for a fair and inclusive society and a productive, sustainable and climate-resilient economy?

From the waste perspective, we see large missed opportunities for cross-sector integration on emissions reductions and wider outcomes. The emissions accounting approach underlying the ERP appears to have reinforced sectoral silos and disabled meaningful integration of actions across the whole economy and society in a number of ways.

For example, emissions from waste have been narrowly defined as biogenic methane from decomposing organic waste in landfill. This approach fails to enable pathways that account for landfill emissions that may be avoided from waste prevention and reduction (apart from some limited food waste reduction proposals put forward). It also ignores the emissions implications of a wide range of activity surrounding the flows of organic materials - from trucking of waste to the potential for offsetting fertilisers and soil carbon sequestration.

The circular economy is a key tool for enabling more holistic emissions reductions and environmental outcomes, and so a circular economy strategy will indeed be needed to make the most of this framework. However, this strategy needs to be delivered by an independent agency in charge of circularity to avoid a further siloed and fractured approach (which is already apparent between the waste strategy and the emissions reduction plan, and between Ministry for the Environment and Ministry for Business, Innovation and Employment approaches to circularity).[17]

We believe this agency should be an intermediary institution that is a cross between EECA and Callaghan Innovation. One of its core functions would be to support the ecosystem development required to radically reduce material flows. The focus would be on using a value chain approach to reduce material flows through the economy. It would also use a consumption emissions lens to drive emissions reductions across government silos and sectors.

23. Is there anything else you wish to share in relation to government accountability and coordination?

N/A

Funding and financing

24. What are the main barriers or gaps that affect the flow of private capital into low-emissions investment in Aotearoa?
N/A

[17] Hannah Blumhardt (3 November 2021) "NZ's government plans to switch to a circular economy to cut waste and emissions, but it's going around in the wrong circles" The Conversation https://theconversation.com/nzs-government-plans-to-switch-to-a-circular-economy-to-cut-waste-and-emissions-but-its-going-around-in-the-wrong-circles-170704

25. What constraints have Māori and Māori collectives experienced in accessing finance for climate change response activities?
N/A

26. What else should the Government prioritise in directing public and private finance into low-emissions investment and activity?

We desperately need some clever thinking around how to make the economics of a transition to a low-waste, low-emissions circular economy work. Getting from where we are now to where we want to be is not going to happen without a redistribution of finance from those who have created and perpetuated the linear economy, to those who want to kick-start circularity.

Currently, economic drivers and investment in waste management systems favour linear business practices upstream. In this environment, making the leap to circular business models and practices, or being a network operator for product stewardship schemes, can be prohibitively expensive, even if it might save money in the long-term for individuals, businesses and finances.

Government can play a role in supporting innovators and local enterprises to jump over this first hurdle. More strategic and thoughtful expenditure of the waste disposal levy revenue is a critical part of this picture, but other tools are needed. For example, strategic use of economic instruments and pricing structures to enable circular material flows, innovative social procurement, and new business and contracting models.[18]

See also our response to question 49.

27. Is there anything else you wish to share in relation to funding and financing?

N/A

Emissions pricing

28. Do you have sufficient information on future emissions price paths to inform your investment decisions?

N/A

29. What emissions price are you factoring into your investment decisions?

N/A

[18] OECD Urban Studies (2020) "The role of national governments in supporting the transition to a circular economy" in The Circular Economy in Cities and Regions: Synthesis Report. Accessible at https://www.oecd-ilibrary.org/sites/724e5c45-en/index.html?itemId=/content/component/724e5c45-en#section-d1e22491.

30. Do you agree the treatment of forestry in the NZ ETS should not result in a delay, or reduction of effort, in reducing gross emissions in other sectors of the economy?

N/A

31. What are your views on the options presented above to constrain forestry inside the NZ ETS? What does the Government need to consider when assessing options? What unintended consequences do we need to consider to ensure we do not unnecessarily restrict forest planting?

N/A

32. Are there any other views you wish to share in relation to emissions pricing?

Currently, waste disposal site (e.g. landfill) operators are captured by the ETS for biogenic methane emissions from landfill. The waste section of the consultation document (p.101) contains proposals that will see a significant reduction (up to 40%) in landfill emissions over the next 10-15 years, yet does not discuss any ETS related matters. This needs to be considered, as it will likely reduce compliance costs of landfill operators and could make it cheaper/more profitable to dispose of waste to landfill, delaying the transition to a circular economy. Increasing the waste disposal levy could help to address this change.

While diverting organic waste from landfill will affect ETS obligations, there has been no consideration of the potential for ETS credits corresponding to the carbon sequestration potential of organic waste treatment. In particular, substantial international evidence demonstrates that composting and applying compost to soils has the potential to increase soil organic matter, which in combination with sustainable and regenerative farming practices can enhance soil microbial biodiversity and increase soil carbon sequestration.[19] We recommend the development of an ETS credit regime applying to composting and use of compost.

While a commercial ETS credit regime could create useful economic incentives for improving agricultural practices and the development of composting infrastructure, there is also substantial potential benefit for a similar 'community carbon credit' regime to recognise the benefits of community activities that help reduce emissions and sequester carbon. Initiatives like community composting and community gardens provide these benefits on a small scale, yet almost all of the time and labour of these efforts are voluntary. Providing a community carbon credit regime could recognise the value of this work while also incentivising a much greater uptake of this kind of activity in urban areas. It would also give a much needed boost to the growing urban farming and local-scale composting sector (see e.g. For the Love of Bees and the Urban Farmers Alliance) who are developing innovative social enterprises focused on climate mitigation and resilience, but who face many obstacles to financing and expanding their reach.

[19] https://drawdown.org/solutions/composting; https://link.springer.com/chapter/10.1007%2F978-3-319-66981-6_16; https://pubs.acs.org/doi/10.1021/acs.est.0c00364

Planning

33. In addition to resource management reform, what changes should we prioritise to ensure our planning system enables emissions reductions across sectors? This could include partnerships, emissions impact quantification for planning decisions, improving data and evidence, expectations for crown entities, enabling local government to make decisions to reduce emissions.

N/A

34. What more do we need to do to promote urban intensification, support low-emissions land uses and concentrate intensification around public transport and walkable neighbourhoods?

We support the work seeking to integrate emissions into urban planning policy. We would also like to see more work on integrating initiatives into urban planning that support both climate mitigation and adaptation - particularly around zero waste, resource recovery and food security. Currently, some urban planning rules present barriers for local-scale initiatives and SMEs to setting up or expanding their activities. Small-scale, community-led resource recovery, composting and urban farming initiatives often must navigate complex rules and consenting procedures that were designed for large-scale activities. The environmental impacts of small-scale activities are far easier to manage, and so a permissive environment that makes it easier for community enterprise to get established should be created, which would also make it easier for local government to support and foster innovative community initiatives.

35. Are there any other views you wish to share in relation to planning?

We recommend the government consider the overlapping literature for planning for low-carbon cities, and planning for zero waste cities. We encourage the government to refer to the two Zero Waste Masterplan documents produced by Zero Waste Europe (ZWE) and GAIA. These two masterplans offer a comprehensive, practical outline of the tools and strategies that cities can implement to achieve dramatic reductions in waste, much of which touches on planning:

- Joan Marc Simon, Jack McQuibban, Pierre Condamine (2020) The Zero Waste Masterplan - Turning the vision of circular economy into a reality for Europe (Zero Waste Europe).
- Aditi Varshneya, Ruth Abbe, and Alex Danovitch (2020) The Zero Waste Masterplan: A guide to building just and resilient zero waste cities (Global Alliance for Incinerator Alternatives: Berkeley, CA).

In addition, the growing literature around Zero Waste Cities is useful.[20]

Collectively, these resources provide blueprints for sustainable cities that impact on planning, including the 15-minute city concept, greening city spaces, planning rules that enable community

[20] https://zerowastecities.eu/

enterprise, localised composting and urban farming, dedicated buildings, sites, zoning, permits and planning rules for zero waste activities.

Research, science and innovation

36. What are the big challenges, particularly around technology, that a mission-based approach could help solve?

We need a lot of work in systems innovation over material or product innovation. Engineering that enables mode shifting and overall reduction rather than replacements of one product for another. E.g. transport system and urban planning design over investment in EVs and biofuels (good to see this recognised to some extent, but still assumes high levels of individual vehicle ownership). New construction and deconstruction methods rather than new materials. Decentralised networks of resource recovery and organic waste processing facilities that are sited based on need (e.g. near where materials are used, on-farm) rather than centralised collection and processing technologies.

There will certainly be a place for material and product innovation, but its application should be limited and integrated within wider system innovation. The purposes of material innovation should be geared towards reducing the harm and toxicity of products during their use phase in order to achieve the goals of a safe, circular economy that regenerates natural systems. For example, material innovation to reduce use of persistent organic pollutants in products from electronics to food contact materials, or to reduce/eliminate microplastic shedding.

We also need far better cross-sector collaboration and integration. Frameworks like the circular economy and a value chain approach to materials and resources will be critical to make this work. See our response to question 22.

37. How can the research, science and innovation system better support sectors such as energy, waste or hard-to-abate industries?

The waste sector sorely needs innovation in the area of product and business model redesign to achieve outcomes at the **top** of the waste hierarchy (i.e. waste prevention and reduction at source, and product reuse). Too much research, science and innovation goes towards making use of waste once it's already produced rather than going upstream to eliminate it, changing the feedstock for single-use products to renewables, or efforts to make compostable products. Apart from failing to meaningfully address overconsumption and its associated upstream emissions, these approaches also tend to rely on the merging of the biological and technical loops of the circular economy, which is not advisable.

38. What opportunities are there in areas where Aotearoa has a unique global advantage in low-emissions abatement?

N/A

39. How can Aotearoa grow frontier firms to have an impact on the global green economy? Are there additional requirements needed to ensure the growth of Māori frontier firms? How can we best support and learn from mātauranga Māori in the science and innovation systems, to lower emissions?

N/A

40. What are the opportunities for innovation that could generate the greatest reduction in emissions? What emissions reduction could we expect from these innovations, and how could we quantify it?

N/A

41. Are there any other views you wish to share in relation to research, science and innovation?

N/A

Behaviour change - empowering action

42. What information, tools or forums would encourage you to take greater action on climate change?

Please see our response to Q.44

43. What messages and/or sources of information would you trust to inform you on the need and benefits of reducing your individual and/or your businesses emissions?

Please see our response to Q.44

44. Are there other views you wish to share in relation to behaviour change?

Behaviour Change - Empowering action!

The Emission Reduction plan headline for behaviour change references 'empowering action' but all of the description below the header focuses on distributing information, awareness raising and education from the top down.

All of these are necessary and useful activities but we do not think they will drive behaviour change. Keeping people informed, consulting people and allowing them to 'co -develop' and share the government's vision are largely passive activities that involve absorbing or reacting to material that has been created by another.

Making an equitable transition to a zero carbon, zero waste circular economy which enables us to stay within planetary and social boundaries is a massive intergenerational change management

project. Motivating and supporting people to get involved in this work and to carry what they are learning into all their different roles in life will provide good quality full time jobs for thousands of people.

To drive deep and long term systemic behaviour change we need to take a totally different approach to the 'top down' one we have now. We agree that the Government should play a central role in **enabling and empowering others** to do the kinds of long term relationship based work that is required to support communities and enterprises to take climate positive action.

Communities are powerhouses of innovation

A recent newsroom article that pointed out that communities are hotbeds of climate action rang true for us[21]. The authors posed the question why communities are being overlooked in government policy making when they are actually powerhouses of innovation and change. The stereotypes of communities listed in the article were familiar caricatures.

We have noticed them drifting past as we have waded through hundreds and hundreds of pages of writing on climate change (along with other government consultation documents and long reports). Apparently we are: "groups that need persuasion to change, victims of job losses, uninformed citizens that require education and people who need to be told to move away from increasingly risky locations". This does not ring true for us.

We have thousands of people across our networks who have been working on climate change, water quality, biodiversity, community development, local economy, zero waste/para kore, intergenerational education, food resilience, creating warm, healthy homes, tree planting, active transport and a multitude of other behaviour change and action projects. Some for many years, some just showed up yesterday.

Some communities have been working on their own local transition strategies for more than 20 years. Mana Whenua and Tangata Whenua have been working on theirs for hundreds of years. Communities are taking on the big global challenges and bringing them down to a local scale so they can take action and make progress. They don't separate out waste strategies from circular economy strategies or divide up adaptation and mitigation strategies.

Every day communities work on a practical level to make the best use of what they have to deal with the challenges and opportunities that they face. There are already a huge number of very experienced behaviour change experts working across the board on multiple interconnected behaviour change projects. Tapping into these diverse and dynamic networks is the best way that the government can get involved in the behaviour change game.

[21] https://www.newsroom.co.nz/ideasroom/what-our-climate-policy-is-overlooking

Government needs to delegate resources and responsibility ASAP

We note that the Climate Commission advised embedding behaviour change in policies and programmes and establishing a specific fund for this purpose with a nominated lead agency. We agree that this should build on what is already in place with a greater focus on interventions and campaigns.

The best way to do this is to delegate responsibility and the resources required to deliver on that to the local scale where there are already a huge number of people and projects working in this space. Current funding mechanisms for this work are weak. Common problems:

- Funding arrangements often only enable part time roles
- No resources made available for coordination or network development
- 3 year maximum funding cycles so just when a programme gets going we have to shut it down and come up with a new idea or a reframe
- Transaction costs are high - applications, reporting, contract management takes as much or more time than doing the work.
- Funding does not cover 'staff time' which is the primary component of behaviour change work which is relationship based

Allocating funds to investment in multiple forms of behaviour change will enable capacity building, skills development and culture change across government, business and society at large

Making the shift to a circular economy will require a mindset shift like the one that has accompanied the Health and Safety revolution that Aotearoa has been through over the last 20 years. This will require significant strategic investment in behaviour change working from the bottom up as well as the top down.

We recommend that government:

- Allocates a substantial budget for behaviour change work.
- Draws this from multiple sources eg. at least 20 % of the Waste Minimisation Fund should be allocated to behaviour change project work to be spent on local delivery by a diverse range of operators.
- Channels this funding through several different intermediaries including EECA, a new Circular Economy and Zero Waste Agency that operates in a similar way to EECA but focuses on reducing waste, as well as through appropriate channels to reach Māori and Pacific target audiences.

Behaviour change is a public good

Behaviour change work is a public good. It needs to be invested in so that we can bring everyone along on the journey. It is a major transition for most people to shift to a low carbon lifestyle. It is a long-term, relationship-based process. The best people to learn something new from are the people that speak your language, live in your community and are in it for the long haul. They are

the same people who will be able to engage in a long term conversation about what it means to change.

These kinds of conversations gradually turn into mutual support systems, action projects, enterprises and events. Tackling the twin challenges of reducing waste and emissions involves a paradigm shift like the one that brought us the industrial revolution. Substantial investment will be required to build the capacity, skill and knowledge base we need to make the jump. Investing in building the institutional, human and social capital required to change the ways we behave in all our roles needs to be a key priority for government investment and enabling action.

The energy, passion and focus apparent in our concerns about 'waste' issues can be harnessed to use waste as a 'doorway' into emissions reductions for businesses, families and communities. Linking waste and emissions reductions together under the circular economy banner creates a coherent story about how we can change.

To be effective in the context of Aotearoa New Zealand, behaviour change needs to be underpinned by a strong partnership between Tangata Whenua and the Crown. Te Ao Māori and mātauranga supports and deepens our understanding of what a sustainable, inclusive and productive ōhanga āmiomio (circular economy) could be.

Making the jump from a linear extractive economy to a circular regenerative economy is a mission that requires collaboration across traditional boundaries. Strong partnerships and cooperation locally, nationally and internationally will enable us to share knowledge and expertise so we can learn from and support one another.

Creating a zero waste culture to enable a circular economy

People have already signed up for the mission to reduce waste. Colmar Brunton's Better Futures 2021 report has three 'waste' issues in the top 10 concerns: #6 build up of plastic in the environment, #7 not enough waste is recycled and #10 overpackaging, non recyclable packaging and landfill.[22] We can harness this passion for solving our waste problems to make progress on less tangible goals like emissions reductions.

Waste is front of mind because we deal with products and packaging all day, every day. We have come a long way in the 30 years since we first started talking about our waste problems. Households, businesses and communities are already using zero waste strategies like reuse, repair, composting and recycling to keep products and materials in circulation for longer. And to avoid making or buying unnecessary goods or packaging in the first place. It is an easy entry point with a fast feedback loop.

Better futures 2021 noted a growing commitment to sustainability, but 49% of participants still think climate change problems are in the future. Waste issues are tangible, real time intrusions

[22] Colmar Brunton (2021) *Better Futures 2021*. Retrieved from https://www.colmarbrunton.co.nz/better-futures-reports-2021/.

into our wellbeing bubble. Big global problems like climate change are harder to get a handle on. It's easy to push them into the "I'll worry about that one day" box.

Action on waste and resource efficiency is an obvious way for the Government to support New Zealanders to make a just transition to a climate-resilient, sustainable, and low emissions economy. Reducing waste reduces both production and consumption based GHG emissions. The Circular Economy provides the conceptual framework and the behaviour change model we need to make the shift. If we embed it in the wellbeing approach we can make sure community and social resilience are built in.

Responsible production and consumption

The Circular Economy concept is a useful reframe that pulls together lots of different threads[23] to create a coherent theory of change. It has a simple narrative that describes how we can work together across the supply and recovery chain to design out waste and pollution, keep materials and products in use for longer and regenerate natural (and social) systems. It is a story we can all understand.

Circular Economy speaks to the elephant in the room which is the need to make the shift to responsible consumption and production systems (SDG #12). We need to transform the way we use our economy to resolve our waste, emissions and resilience problems. The way the economy works now is an outcome of the way the system is organised and the ways the different players relate to one another. We can choose to behave differently[24].

The 'Circular Economy' can be used as an umbrella to pull together waste, resource efficiency and emissions actions in a way that captures hearts and minds. Used in this way it becomes a 'poster child', a call to action and a roadmap for system change.

Scotland and Wales are already using this strategy. Zero Waste Scotland works across the board to implement zero waste and resource efficiency strategies to create a circular economy. The focus is building capacity and relationships across supply and recovery chains to support everyone to play their part. Wales started with One Wales: One planet in 2009 moving on to create the Wellbeing of Future Generations Act in 2015. Behaviour change and engagement have been prioritised to bring everyone along on the journey[25].

Multi-pronged approach

In its early work on changing recycling behaviour WRAP surprised us with the idea that to get to a 70% recycling rate you need 80% of the people to recycle 90% of their stuff. The moral of that story is that it is a big behaviour change job to reach critical mass.
You have three main tasks:

1. Create an operating environment where it is easy to do the right thing (Structural)

[23] Biomimicry, zero waste, cradle to cradle, natural capitalism, industrial ecology, the performance economy, lean production etc
[24] Mazzucato,M 2021 op cit
[25] Davidson J 2020 Future Gen Lessons from a small country https://janedavidson.wales/book

2. Engage people so they take action in their various roles (Collaborate + Empower)
3. Make sure they have the information they need to participate (Why, what and how).

The need to integrate the fundamental concepts of Te Ao Māori, mātauranga, systems thinking, resource efficiency and circular economy into primary, secondary, tertiary and vocational education curricula is a given. It should underpin the reform of the New Zealand Vocational Training system.

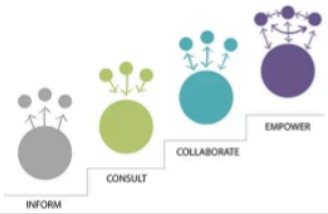
Developing and implementing awareness raising campaigns is also important. These need to be resourced at the local, regional and national scales to ensure the styles and mechanisms of engagement are relevant for the target audience. Multiple voices need to be used to communicate key messages so they resonate with a wide range of communities and stakeholder groups, Māori and Pacific in particular.

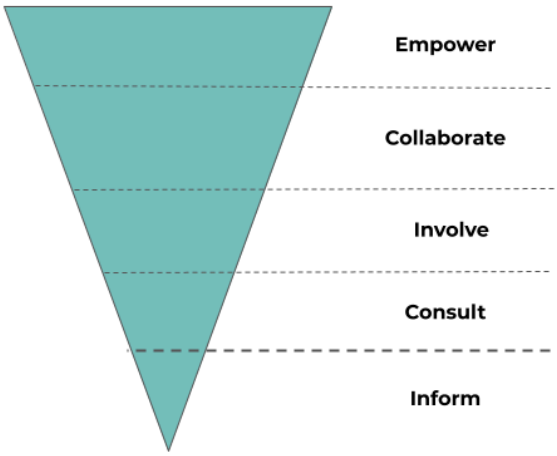
Building resources, capacity, relationships and momentum are medium to long term activities. Behaviour change programmes need stable, enduring public funding to make best use of the investment required to get up and running and build an audience. There are many examples of programmes that were making a real difference but were unable to access funding after they had been running for three years.

We don't have to reinvent the wheel. There are useful examples of successful approaches we could tap into eg. WRAP, Zero Waste Scotland. The Love Food Hate Waste campaign run by WasteMinz is a good example of taking a successful formula from overseas and rolling it out in Aotearoa.

It is vital that we invest in building the capacity we need to use Te Tiriti principles and mātauranga māori to underpin the frameworks, programmes and resources being created as well as enabling development of specific Te Reo content.

Shifting mindsets
New ways of working together will get everyone on board so we can all help to make the shift to a regenerative, circular economy





Empower	Problem solving and decision making power decentralised. Resources to enable implementation and action made available so problems are resolved.
Collaborate	Work together to define problems, develop alternatives and identify and implement solutions. Shared responsibility and access to resources required.
Involve	Consider stakeholder concerns and aspirations through process. Have a say in the discussion but may not have any real involvement in decision making.
Consult	Give feedback on analysis, alternatives and decisions, and courses of action that have been developed by and will usually be delivered by others.
Inform	Get given information to help understand a problem, issue, alternative or solution and how you can participate to make use of an existing system.

26

Capacity and capability building

Behaviour change is generated through a complex intersection of cultural, structural, and interpersonal factors. Behaviour change campaigns are just one piece of the behaviour change puzzle. Giving people information can be helpful but the end game is getting them to join in. The 70:20:10 rule[27] is a learning and development model that shows us that 70% of our learning happens through the practical activities we do in our various roles.

By taking practical steps to act in ways that reduce waste, emissions we come to see ourselves as the kind of people who care about that kind of stuff and we expand our range. Engaging people from all walks of life through public processes that get them to take action and share responsibility for both the problem and the solution is a critical pathway for building a coalition of the willing.

Circle Economy[28] see Human Capital as the driver of change, because it is people that create policy, run systems, organise action and do the practical work that brings the circular economy to life. Taking a whole system approach to behaviour change means we get behind the Circular Economy mission in all of our roles, at work and at home in our communities.

The table below describes the features, requirements and likely success rates for three different approaches to education programmes. Long term behaviour change takes time, energy and money.

[26] Step diagram from https://greensam.eu/atlas-old-bu/roles-of-participants-and-levels-of-participation/
Ladder diagram adapted from
https://sustainingcommunity.wordpress.com/2017/02/14/spectrum-of-public-participation/
[27] Model for learning and development. formula based on the idea that we learn 10% through formal education, 20% from others and 70% through practical activities we do in our various roles
[28] Haigh, L., de Wit, M., von Daniels, C., Colloricchio, A. and Hoogzaad, J. (2021) *The Circularity Gap Report* (Amsterdam: Circle Economy), https://www.circularity-gap.world/2021.

And it works. One size doesn't fit all. The value comes from local flavour, creative approaches and the opportunity to learn by doing. The best behaviour change programmes are the ones you don't realise are happening because they are seamlessly integrated into service delivery and fun events and activities.

Zero Waste Education Categories. (Adapted from Oregon Metro, 2015)[29]

Type of Education Programme	Public and customer service communications	Awareness building	Behaviour change Interventions
Basic features	Information about waste related issues and/or activities. This type of education plays an important support role for the other two types of programmes or are used to reinforce an adopted behavior by providing information on locations, schedules, etc. It also has a role in creating customer recognition and satisfaction in a service.	Campaigns or programs designed to actively seek out audiences to increase awareness of local tools and services, and provide information about waste prevention, reuse and recycling. The purpose here is to educate people on available services, desired behaviors and where to obtain more information.	Programmes of sustained education with the goal of modifying a targeted behaviour of a specific group. These programs use multiple strategies to encourage specific audiences to become knowledgeable about the benefits of a very specific behavior, acquire skills to engage in the new behavior and remove barriers to participation in the behavior.
Cost to implement	Low	Low- Medium	High - these require ongoing contact and support of participants over time
Potential for behaviour change	Low	Low	Medium - High
Audience	General, made available to those who seek it	Specific audiences are considered in the design of the	Designed and delivered to a specific audience

[29] Oregon Metro. (2015). Waste Prevention, Reuse and Recycling Education: A handbook of principles and best practices. Portland: Oregon Metro

		materials and/or activity	
Examples	Information sheets on composting; Rubbish collection day information; Auckland Council's Make the Most of Waste website; Council customer service hotline	Events, Love Food Hate Waste Campaign; Best and Worst Packaging Awards; Information stalls at events; Community engagement processes such as surveys; Advertising.	Compost Collective workshops; Para Kore programme; Kai Conscious Waiheke programme; Zero waste education in schools; Enviroschools.
Possible Measurements	Number of info sheets distributed, number of unique calls/web visits	Campaign reach via number of social media shares and likes; number of survey respondents; number of event attendees; Survey results	Level of initial and sustained behaviour change; participant feedback, survey results

Moving Aotearoa to a circular economy

45. Recognising our strengths, challenges, and opportunities, what do you think our circular economy could look like in 2030, 2040, and 2050, and what do we need to do to get there?

What does a circular economy look like

People involved in the Zero Waste Network Aotearoa started imagining a zero waste future way back in 1989 when our first community recycling centre opened in Kaitaia. We have been using practical zero waste strategies to reduce waste (and emissions), connect our communities, and build our local economies ever since.

Humans are slowly growing alternatives to the 'take-make-waste' approach to running our economy. Over the last 20 years ideas like cradle-to-cradle, the performance economy, biomimicry and industrial ecology have been cross pollinating. The concept of the circular economy has emerged as a useful frame for this thinking. It enables us to think more clearly about how we can use resources, such as materials and energy, to meet our needs within social and environmental limits.

The basic idea is that we are trying to turn our economy into a closed loop by reducing throughput. We minimise 'leakage' (as waste, pollution or emissions) so materials, products and the energy embodied in them stay in circulation for as long as possible. It is all about getting the maximum use value from the raw materials and energy we extract from our environment. The goal is to minimise the amount of new raw material and fossil fuel we need to draw in so we minimise the ecosystem damage and biodiversity loss caused by extraction and pollution.

Zero waste is the story of the actions we can take to slow down flows of products and materials through our economy. It provides a philosophy, a toolkit and a destination. When we reduce waste we also reduce emissions so zero waste is climate action. The 'big idea' behind circular economy is that we can use the Waste Hierarchy to prioritise actions that reduce material flows, waste and GHG emissions. Doing this shifts us towards our circular economy vision while keeping us within planetary and social boundaries.

The tools in the toolkit are the:

- Circular Economy, which describes flows of materials (waste) and energy (emissions)
- Waste Hierarchy, which prioritises action for both inorganic and organic materials
- Takarangi, which is the Aotearoa version of the doughnut economy concept that sets out evidence-based limits on planetary and social boundary indicators.

Zero Waste Europe has developed a useful vision document that describes how a circular economy might look if you walked out your front door into it tomorrow. The types of activity that characterise this circular economy of the future are all present in our current economy. The work we have to do over the next ten years is to reshape the economic ecosystem so that it is a better fit for circular enterprise models. We need to create the conditions in which circularity can flourish. This image from Zero Waste Europe's Dare to Imagine a Better Future [30]gives sense of what that might look like.

[30] From Zero Waste Europe, with an accompanying narrative: https://zerowasteeurope.eu/wp-content/uploads/2020/07/zero_waste_europe_booklet_dare-to-imagine-a-better-future_en.pdf

Untangling supply, use and recovery chains

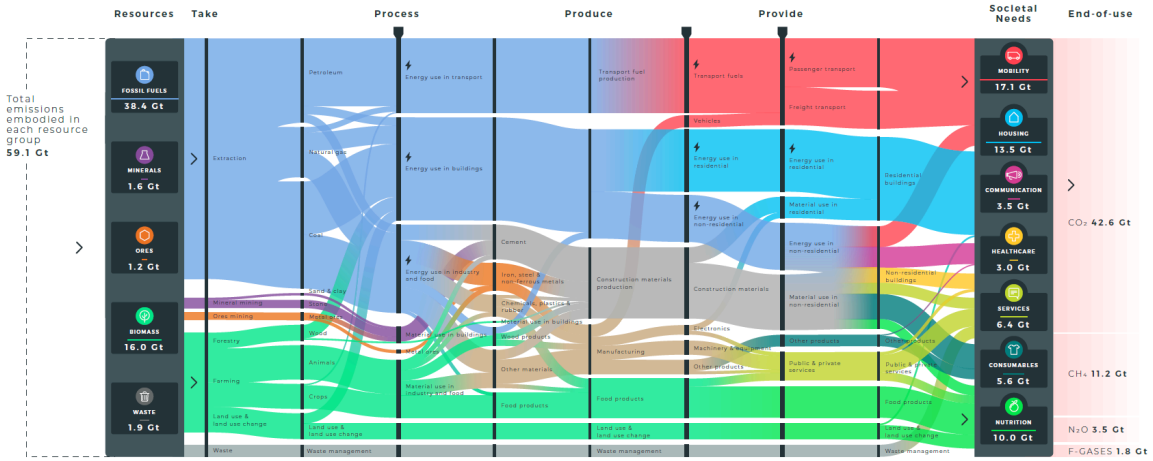
In the past waste was seen as an inevitable output of our production and consumption system. We buried it or burnt it to make it go away. But waste is better understood as pollution and inefficiency. We need to start talking about how we can prevent and reduce waste at source and how we can redesign products and processes to make the best long term use of the materials and energy we consume.

The 'Circular Economy' concept pulls together action on waste, resource efficiency and emissions. *Circle Economy* describes it as '*society central, resource smart and climate safe*'. We need a deep understanding of material and energy flows and a clear picture of our operating context and constraints to effectively tackle waste and emissions. To transform our relationship with waste we need to know what we are dealing with. Naming things is a useful way of unpacking the complex and messy pile that is 'waste'.

Separating and sorting things into groups; following materials, energy and products as they flow through supply and recovery chains; understanding how pollution, inefficiency and emissions are generated along the way - these all help us to get a better understanding of the complex, dynamic global consumption system we are all part of. This understanding creates the platform for establishing effective policy interventions eg. product stewardship approaches.

This 'X-ray' of the global economy produced by *Circle Economy* in their 2021 Circularity Gap Report [31] shows how organic and inorganic resources get combined to create the products and services we value.

[31] Haigh, L., de Wit, M., von Daniels, C., Colloricchio, A. and Hoogzaad, J. (2021) *The Circularity Gap Report* (Amsterdam: Circle Economy) p 20-21 https://www.circularity-gap.world/2021.



On the right are key inputs: fossil fuels, minerals, ores and biomass. On the left are key outputs: mobility, housing, communication, healthcare, services, consumables and nutrition. The grey bar at the base shows waste created and the pink sidebar details the emissions generated. The large green biomass input flags the importance of organics in a circular economy strategy.

Circle Economy uses their data to create global and regional circularity indexes.[32] They calculate the global economy to be 8.6% circular (sadly that makes us 91.4% linear). The good news is they estimate that we could stay within 1.5 degrees of warming if we double circularity by 2032 to get us to 17%[33]. Increasing circularity requires interventions at multiple points across supply and recovery chains. We urgently need to invest in fostering and supporting the zero waste and circular activities already present across our economy to enable this.

Their analysis shows that material handling and use account for 70% of global GHG emissions. *Circle Economy* points to the urgent need to move beyond a narrow energy focus on emissions reductions to *'apply circular strategies where materials and emissions intersect'*. By their calculations this would enable us to reduce GHG emissions 39% and virgin resource use by 28% to help keep our impacts within planetary boundaries.

Resource Efficiency

In the UK, WRAP has been working on the links between resource efficiency, waste and emissions for many years. Key strategies identified in their seminal 2009 work included:

- life time optimisation - making things last longer
- changing the way we consume - goods supplied as a service - e.g. car share.
- shifting to a restorative circular economy - reduce, reuse, repair, recycle, compost.

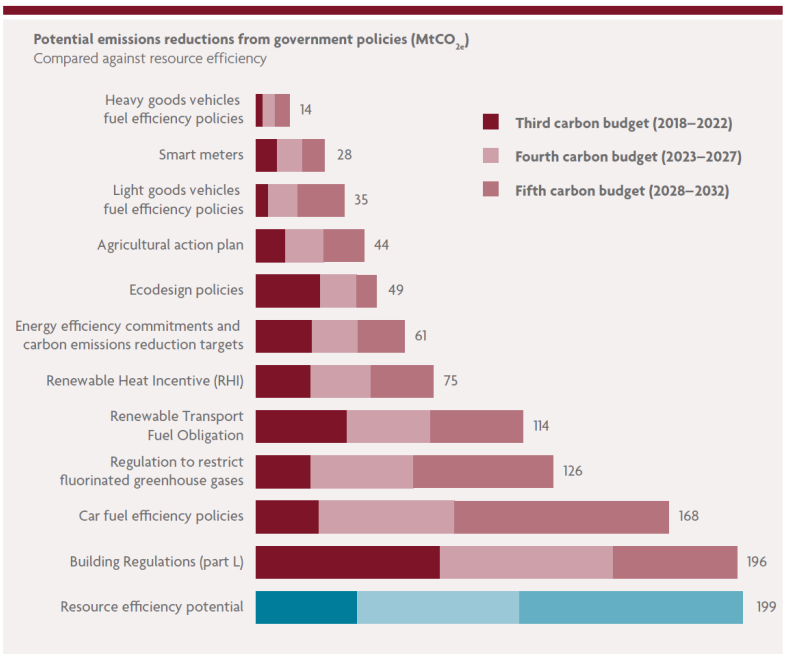
Zero waste strategies like these maintain widespread access to goods and services while reducing the impacts associated with linear production and consumption. Shifting to new ownership and

[32] Haigh, L. et al (2021) op cit

[33] The really sad news is that we are going backwards at the moment, the 2018 index was 9.1%.

delivery models means we can get the same value with lower inputs through durability, right to repair, reuse and sharing mechanisms.

WRAP's recent comparisons[34] of the relative emissions reductions potential of a range of Government policies for the UK's third, fourth and fifth carbon budgets, shows resource efficiency coming out on top.



▲ **Figure 4. Resource efficiency has great potential to cut UK emissions (in million tonnes of CO_{2e}). (© Green Alliance)[9]**

Links between waste and emissions

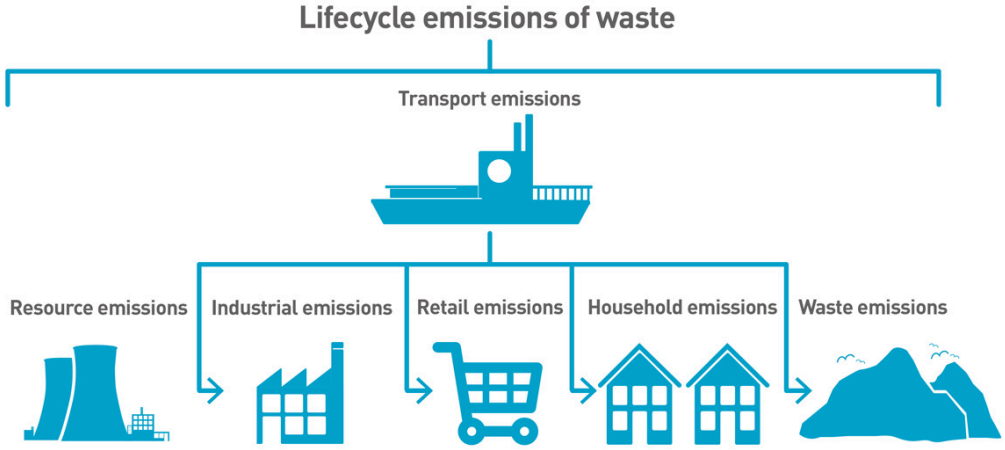
There are three main types of emissions generated from the 'waste' our economy creates as a side effect of production and consumption systems.

1. Emissions from landfill: mainly biogenic methane from organics stored in landfills
2. Consumption-based emissions: greenhouse gases generated across the product life cycle (mainly CO2 and N2O)
3. F-Gases: HFCs escaping to the atmosphere from products eg. air conditioning units.

Biogenic methane emissions show up in production-based emissions accounting. This is the main component of the 4.9% of GHG emissions the waste sector contributes to New Zealand's emissions profile. The long-lived consumption-based emissions generated upstream from extraction, production, transport retail, use and resource recovery of packaging, and all our other stuff, show up in consumption emissions based carbon foot printing analysis.

[34] Hill, Maddox, Mahon. (Feb 2020) 'How can a Circular Economy help us meet net zero?' *Environmental Scientist The World Wakes Up to Waste*, p. 22. Retrieved from: https://www.the-ies.org/resources/world-wakes-waste.

Scotland uses both forms of analysis to guide decision making as part of its commitment to shift to zero carbon by 2045.[35] StatsNZ produced its first set of consumption based accounts[36] in 2020. The Climate Commission's advice recognises the critical role resource efficiency plays in reducing onshore and offshore consumption emissions. This graphic from Zero Waste Scotland shows how emissions are generated across product life cycles.



(Image from Zero Waste Scotland website)[37]

About half of our emissions are directly related to energy consumption[38]. To achieve our emissions reduction targets we need to decarbonise and reduce throughput of goods. Reducing emissions from the transport sector needs to go well beyond electrifying the private vehicle fleet. Prioritising access to EV's through car sharing schemes, public transport and shifting across to active transport modes including electric bikes, will reduce the number of vehicles that need to be produced, maintained, parked and recycled.

Keeping products and materials in use retains the use value of embodied energy as well as the materials. Plastics, textiles and e-waste all generate high emissions upstream. For example, Scottish research[39] found that textiles comprise 6% of the average domestic rubbish bag but account for 34% of the emissions profile.

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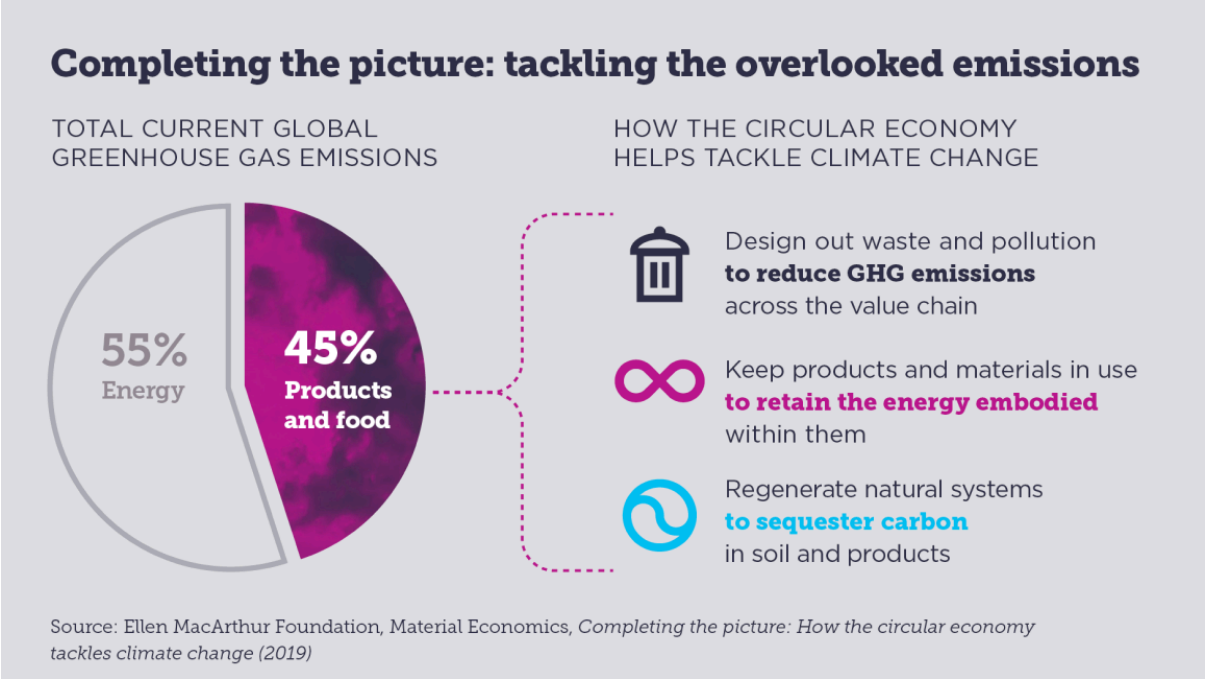
[35] Nwabufo, Chidubem and Warmington, Jamie (2020). 'Measuring Scotland's progress towards a circular economy to help combat the climate emergency. Results from a preliminary scoping study reviewing key indicators.' Edinburgh: Zero Waste Scotland. Retrieved from https://www.zerowastescotland.org.uk/sites/default/files/Branded%20Report%20MetricsV1.pdf.

[36] https://www.google.com/url?q=https://www.stats.govt.nz/information-releases/greenhouse-gas-emissions-consumption-based-year-ended-2017&sa=D&source=docs&ust=1637567555816000&usg=AOvVaw1qdYDXGw9xp9ugbL5S_h53

[37] Image taken from Zero Waste Scotland "What is the Carbon Metric?" at https://www.zerowastescotland.org.uk/our-work/what-carbon-metric.

[38] Image retrieved from https://www.ellenmacarthurfoundation.org/our-work/activities/finance?gclid=Cj0KCQjw24qHBhCnARIsAPbdtIJsfB864PvFSrIS2WsRvj8EWIQJfmQ0PYvl-sCenF0tCN0D4WdPoacaAqxiEALw_wcB

[39] Zero Waste Scotland household rubbish survey 2020



To make progress Aotearoa needs to be a fast follower

Circular cities, regions and countries are popping up around the globe. They are collaborating and sharing knowledge to support one another to move into new spaces. They are developing new ways of: thinking, working, taking action and measuring and gathering insights. The pathway to the circular economy is continuous innovation based in a practise of learning by doing. It is something that happens in the messy real world and it needs to be supported by new models of policy development and investment.

46. How would you define the bioeconomy and what should be in scope of a bioeconomy agenda? What opportunities do you see in the bioeconomy for Aotearoa?

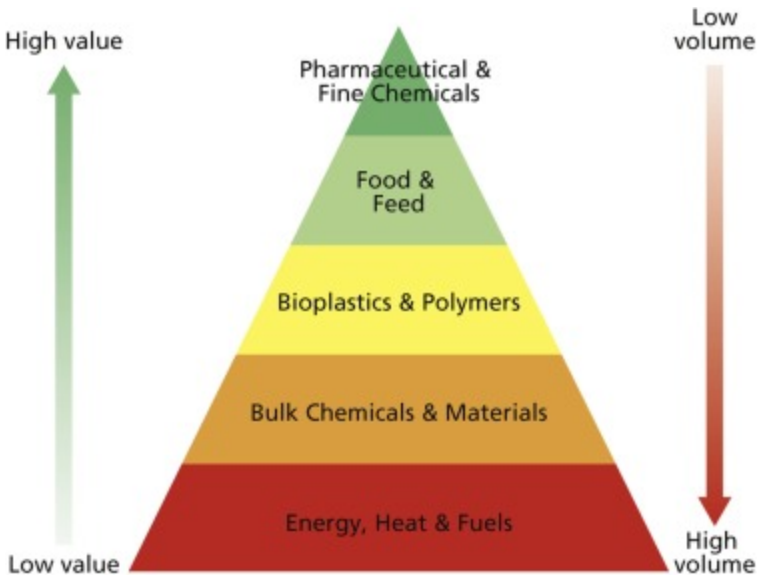
It is important to recognise that the concept of the bioeconomy has an entirely different whakapapa or origin to the circular economy. The bioeconomy, being based on replacing fossil-based products, materials and energy with renewable biomass, does not automatically align with circularity, nor necessarily environmental sustainability.

These two concepts have only recently been merged as the 'circular bioeconomy', and the immaturity of the concept is evident in the diverse and conflicting understandings of it in literature.[40] The most comprehensive definition of a circular bioeconomy we have found is the following:

[40] Mario Giampetro (August 2019). 'On the Circular Bioeconomy and Decoupling: Implications for Sustainable Growth.' *Ecological Economics*, Vol 162. pp. 143-156. https://doi.org/10.1016/j.ecolecon.2019.05.001

"The circular bioeconomy focuses on the sustainable, resource-efficient valorization of biomass in integrated, multi-output production chains (e.g. biorefineries) while also making use of residues and wastes and optimizing the value of biomass over time via cascading.
Such an optimization can focus on economic, environmental or social aspects and ideally considers all three pillars of sustainability. The cascading steps aim at retaining the resource quality by adhering to the bio-based value pyramid and the waste hierarchy where possible and adequate."[41]

The 'bio-based value pyramid' referred to in this definition is a guide for prioritising the use of biomass, which may challenge the government's enthusiasm for bioenergy as it is the last and lowest in the value chain:



Missing in Scope

While the above model and definition provides guidance on keeping materials in circulation for as long as possible, they do not address two other crucial pieces at the heart of the circular economy: **designing out waste** and **regenerating natural systems**.

Waste is a symptom of an inefficient process and should be eliminated as far as possible through redesign of products and systems, rather than treated as inevitable. Focusing on waste prevention would require an analysis of sectors that provide the feedstocks for the bioeconomy (e.g. agriculture, forestry and wastewater/sewage) to assess whether efficiencies and improvements can be made in these sectors to design out waste and pollution (including environmental harms like soil erosion and degradation) in the first place.

[41] Paul Stegmann, Marc Londo and Martin Junginger (May 2020). 'The circular bioeconomy: Its elements and role in European bioeconomy clusters.' *Resources, Conservation & Recycling: X*, Vol. 6: https://doi.org/10.1016/j.rcrx.2019.100029

There is no detail on how the bioeconomy proposed will regenerate natural systems, in particular soil as the foundation of all land-based ecosystems. Current models of industrial forestry and agriculture are eroding soils at significant rates (see question 4).

Any bioeconomy strategy must not only be developed in the context of a broader circular economy strategy but also in partnership between Māori and the Crown. There needs to be careful consideration of how the bioeconomy might not only align with te ao Māori but also uphold Te Tiriti o Waitangi.

A bioeconomy will heavily rely on lands, natural resources and taonga over which Māori have kaitiaki status (e.g. nearly 50% of commercial forestry in Aotearoa is on Māori-owned land and is only set to grow with future Treaty settlements). Upholding the guarantee of tino rangatiratanga under Article 2 of Te Tiriti would require the priorities and concerns of mana whenua to take precedence.

47. What should a circular economy strategy for Aotearoa include? Do you agree the bioeconomy should be included within a circular economy strategy?

The Circular Economy Strategy should include all organic/biological materials and inorganic/technical materials. A holistic approach is required to make sense of raw material and energy flows through the economy. A Circular Economy Strategy for Aotearoa should also be grounded in te ao Māori, recognising the commonalities and differences between European concepts and mātauranga Māori, as well as day-to-day realities of communities in Aotearoa.

Alignment with Aotearoa Waste Strategy

Implementation has been the critical stumbling block for Aotearoa when it comes to Waste strategies. This is our third one in 20 years and the reason we are still talking about waste is because we made very little traction with the first two. It is critical that the Circular Economy strategy and the new waste strategy are very closely aligned.

These are five things that will drive change up the waste hierarchy to reduce waste and emissions. These are in line with the universal circular economy policy goals developed by the Ellen McArthur foundation. We encourage you to put them at the heart of the Circular Economy Strategy.

1. Create a circular economy & zero waste agency to coordinate action and investment, research and design systems and processes and develop a stable resource recovery ecosystem.

2. Go beyond WMF funding to create a robust and sophisticated story of how we will use economic instruments to create a new finance and funding model for our sector.

3. Use the existing infrastructure as a base to grow a nationwide resource recovery network underpinned by local scale zero waste hubs and enterprises.

4. Use innovative product stewardship approaches to create value chains that link decisions about material and product flows across all phases of the life cycle.

5. Invest in behaviour change to build capacity across society and our economy so reducing material flows and emissions becomes business as usual.

The Circular Economy Strategy should outline:

- Direction of travel - key as themes and drivers
- How it interacts with cross cutting work programmes - inside and outside government
- How the values and outcomes framework will be used as a decision-making tool
- Describe how the tools and big strategic moves will deliver the outcomes (see above regarding our top 3 and organics)
- Clarify critical definitions, shared language and assumptions
- How organics ft into the circular economy story
- Outline how all the players will work together to achieve the outcomes
- Economics - explain how you will use money flows to deliver the outcomes
- Establish clear targets and describe how the measurement tools will be developed (see Q 48)

The Circular Economy Strategy will need to pick a few key areas to focus on. We suggest the following:

Enabling and supporting the development of the emerging zero waste ecosystem

These enterprises are the vanguard of the emerging circular economy. These organisations are already piloting innovative systems, processes, tools, techniques and behaviour change programmes and would make much more rapid progress with system and financial support.

1. There are a large number of existing organisations already working on practical service delivery and behaviour change projects that could expand and replicate. The operating model is generally collaborative with open source sharing and learning by doing.
2. The relationship between their local scale activity and social, environmental, cultural and local economic development are well established. For example, in Auckland, The Southern Initiative is focusing on getting involved in the zero waste/resource recovery space because they see it as a vehicle for creating shared prosperity.
3. There is a high level of demand from local authorities to establish Zero Waste Hubs which are based on the successful Community Recycling Centre Model that has been developed around the country over the last 30 years. Local authorities have sites but they need support to explore new models for procurement and partnership in this space. Once contracts are let they are locked in for 10+ years so putting operators in place that will support the circular economy transition is critical.
4. To succeed the concept of a nationwide resource recovery network needs to be underpinned by a strong network of local Zero Waste Hubs - these combine reuse, repair,

recycling, composting, product stewardship takeback, behaviour change and community engagement. They are already bringing the circular economy to life in their communities and could make much faster progress with systemic support.

Rapidly develop product stewardship structures and economic instruments

It will drive change up the supply chains and fund essential resource recovery system capex and opex.

1. The recovery chain does not have a stable revenue stream. Recovery and recycling is a service. Only a small proportion of the cost is covered by material sales. If we want the work done we need to address this as soon as possible.
2. Creating and applying economic instruments will change the demand for recycling and resource recovery systems. It is likely that paying the real cost of recycling will dis-incentivise the use of single use packaging for example so this could reduce costs for infrastructure and systems.
3. Advance disposal fees need to cover the opex and the capex costs of establishing resource recovery systems to harvest products and materials at end of life.
4. New systems for collecting materials like container return schemes can take the pressure off domestic recycling which increases the quality of materials harvested.

Investing in heavily in local scale behaviour change work

This will build capacity across society and our economy so reducing material flows and emissions becomes business as usual at home and at work.

1. Local voices are trusted - this is very important when engaging in long term conversations about big change in communities. They deliver messages in the right cultural context and language and stick around to talk things over.
2. Behaviour change work in one context ripples up and out into other contexts - so new ideas come home and get turned into community projects, new enterprises and vice versa
3. Well aligned programmes like Enviroschools already exist and they need to be properly funded so they can continue to develop and deliver
4. Intermediaries like ākina, SBN, Zero Waste Network and many others are able to provide relevant skills development already this work needs to be resourced

Amsterdams circular strategy uses value chains as an organising lens

We need to shift our focus from 'waste streams' to material and product flows. This gives us a more useful perspective for thinking about and designing system changes. Amsterdam's Circular Strategy takes this kind of whole system approach. It zeros in on three value chains to support the goal of halving the use of new raw materials by 2030. At first glance it seems to make sense to follow a similar path in Aotearoa.

1. **Food and organics** - to link organic flows with the primary industry, horticultural worlds as well as food processing and distribution. The focus is on short supply chains, healthy sustainable food, high quality processing/composting to return organics to soil and beneficial uses.

2. **Consumer goods** - including textiles, electronics, household goods and packaging. Focus on reducing consumption, keeping products in circulation, best use of discarded products - repair, restoration, container returns and high quality closed loop recycling.
3. **Built environment** - which includes construction and demolition processes. Focus on shaping the environment to encourage circularity in renovation and construction and adaptability of function over time, use of procurement and other tools, coordination across planning, design, construction and use phases to climate proof infrastructure.

Vision / Goals

A Circular Economy is a new concept for most people. The vision needs to paint a picture of how it will be different to what we are doing now. And why that will be better for people and the planet. While the circular economy concept is inspiring for those of us working on the transition, most people are not emotionally connected to it yet or able to imagine what it will look like. The vision needs to inspire everyone to be part of this journey and create the impression that people are involved in the action.

Visioning exercises can be useful for bringing people on board with a big new change. When Wales was working on developing their landmark 2015 Well being of Future Generations Act[42] they ran a public engagement campaign seeking ideas and information about "*the Wales we want*". This was a very successful strategy for getting people on board with a new way of thinking about sustainable development, what the change would mean for people in their own lives and for kickstarting local action projects.

Given the big changes coming as the Emissions Reduction Plans rollout and the desire to connect these with wellbeing and resilience it would be worth considering this as a way of securing consensus and generating a clear set of common wellbeing goals. These are lacking at the moment and each of the big pieces of work being done across government tends to create their own version. Both Scotland and Wales have a defined set of national goals. We think Aotearoa needs to do this piece of collective work.

Making the transition to a zero waste, zero carbon circular economy is a massive societal shift. It would be good to underpin that with some clear wellbeing and resilience goals developed through a collective conversation and decision making process. The Welsh people have 7 connected well-being goals[43]: A prosperous, resilient, healthier, more equal, globally responsible Wales of vibrant culture and thriving Welsh language with more cohesive communities.

[42] https://gov.wales/well-being-of-future-generations-wales
[43] https://www.futuregenerations.wales/wp-content/uploads/2018/11/FGCW-Framework.pdf

The Welsh Example

The Welsh have also enshrined 5 new ways of working into their Wellbeing of Future Generations Act. The reasoning behind this was that everyone needed some guidance on how to behave differently so that they would be able to create different outcomes!

'This is about ensuring that future generations have at least the same quality of life as we do now. The act provides for better decision-making by ensuring that public bodies:

- *take account of the long term*
- *help to prevent problems occurring or getting worse*
- *take an integrated approach*
- *take a collaborative approach, and*
- *consider and involve people of all ages and diversity.'*

Collaboration is a common theme in work describing how we can make the transition. Recent work by the Ellen MacArthur Foundation outlines five universal circular economy policy goals. *Number 5: Collaborating to change the system* describes the different ways we need to work together and grow capacity[44]. Building a diverse and inclusive coalition for action across public, private and civil society is the focus.

Make it clear to everyone how we can get from here to there

In simple terms innovation in the resource recovery space needs to be based on circular economy and zero waste principles. We need to shift to a zero waste approach and goals in the same way as we have recently shifted to a zero carbon approach and goals for emissions. It is important to spell out the connection between waste reduction and emissions reduction so people can make the connection between things they already know, understand and do (reduce, reuse, compost, recycle) and the new ways of talking about this that describe circularity.

Key themes that link zero waste and zero carbon include[45]:

- Design out waste and pollution - (prevention) *to reduce GHG emissions across the value chain*
- Keep products and materials in circulation as long as possible - *to retain their embodied energy*
- Regenerate natural systems - *to sequester carbon in soil and products* (we add social and economic to include connected community and strong local economy)

The 5 Universal Circular Economy policy goals - are useful as a starting point for how to turn thinking about the circular economy into action. A lot of work has already been done to make

[44] Ellen MacArthur Foundation, Universal Circular Economy Policy Goals (2021) retrieved from https://emf.thirdlight.com/link/kt00azuibf96-ot2800/@/preview/1?o p26-27

[45] From Ellen McArthur foundation seen as leaders in this space. Relationship to climate change is detailed in this doc

sense of the best areas to focus energy and effort. This would be a good place for Aotearoa to start as we move into the policy design phase.

1. Stimulate design for the circular economy
2. Manage resources to preserve value
3. Make the economics work
4. Invest in innovation, infrastructure and skills
5. Collaborate for system change

How should organics (and the bioeconomy) fit in?

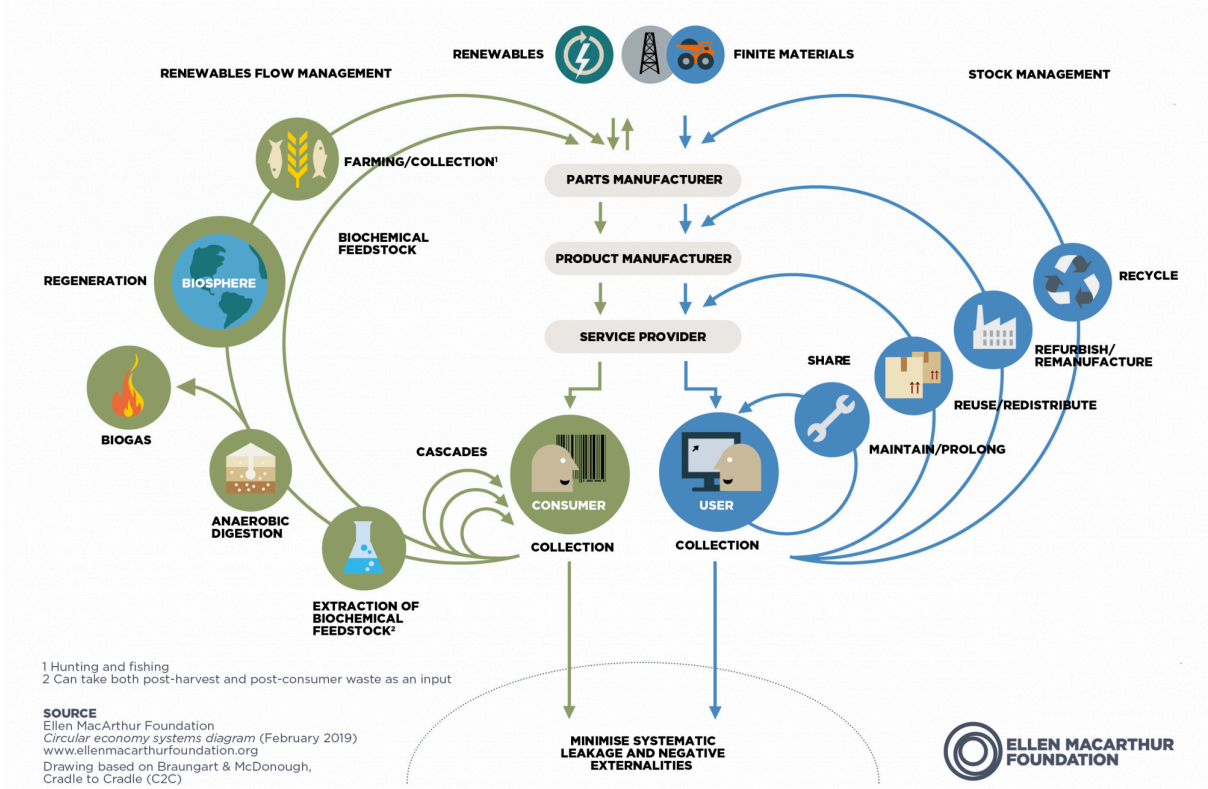
The circular economy is not a separate thing that sits alongside or within the 'economy', it describes a quality *of* our whole economy. Circularity is a measurable quality of our economy that we want to grow and develop. It applies at local, regional, national and global scales. We can use circularity to guide decision making eg. the global economy is 8.6% circular now, it needs to be 17% circular by 2032 for us to stay within 1.5 degrees of warming. We can choose to act in ways that increase circularity in order to reduce material flows and emissions.

It is critical that the Circular Strategy carves out a dedicated place for organics that addresses their real importance. The reductionist focus on organics as generators of 'methane emissions from landfill' or as 'bioeconomy inputs' needs to be radically expanded. The plants, animals and ecosystems that underpin social and economic life also have intrinsic value in their own right.

This broader understanding of the natural world is poorly understood in western philosophy and current mindset. Te Ao Māori and mātauranga are particularly useful for keeping the value of the natural world front of mind. Regeneration needs to be prioritised over use and trade of organic material. The Takarangi which establishes clear environmental limits needs to be a fundamental part of thinking about organics, all of which come from the natural world.

We need to look at organics through an ecosystem, soil and food lens rather focusing primarily on its use value as a product, energy source or 'waste'. (see our response to Q4) The concept of a circular economy is a useful reframe of an old idea 'Cradle to Cradle',[46] which considered resource use in industrialised economies It made the distinction between two types of material flows. One being organic/biological materials that can go safely back around into biological systems. The other being inorganic/technical materials that can be fed back into industrial systems. This is reflected in the butterfly diagram below.

[46] https://en.wikipedia.org/wiki/Cradle_to_Cradle:_Remaking_the_Way_We_Make_Things



Retrieved from https://www.ellenmacarthurfoundation.org/assets/images/_bigImage/Butterfly-Infographic.png

The writers cautioned against 'monstrous hybrids' that are created by combining material types which makes it very difficult to separate them back out again. Short life multi-material packaging or building materials are problematic for this reason. The Climate Commission's advice recognises the value of a strategic approach to the bioeconomy. However, current thinking about organics tends to follow the same 'end of pipe' approach that has limited action to reduce inorganic waste and material flows. The Emissions Reduction Plan Waste section narrowly focuses on reducing methane emissions from organics that end up in landfills.

Complex material stream

The label 'organics' spans a huge range of materials and products: food waste, greenwaste, fibre: paper, card, textiles, timber, composite boards and mixed materials e.g. Tetra Pak and plastic laminated composite board, single-use packaging for consumer goods and takeaways, sewage sludge, farm manure/effluent, dead animals/livestock and byproducts from food processing. Creating strategies to make organics flows more circular has to take this complexity into account.

The 'bioeconomy' seems to be a way of talking about a small subsection of the ways we use biological materials within the economy. Work needs to be done to embed the core principles of a circular economy into bioeconomy thinking. Circular Economy models already account for biological cycles alongside technical cycles. As noted in our answer to question 46, the concept of a

bioeconomy has arisen in an entirely different context to circular economy theory and is not inherently compatible.

Just because a feedstock for a new product or energy source is biomass, doesn't make that end use climate-friendly, non-toxic or regenerative. Burning biomass still creates emissions. Compostable products made from biomass may still be using additives that are harmful for human health and soil.[47] Composite products that mix biomass with polymers do not align with the need to design for circularity.

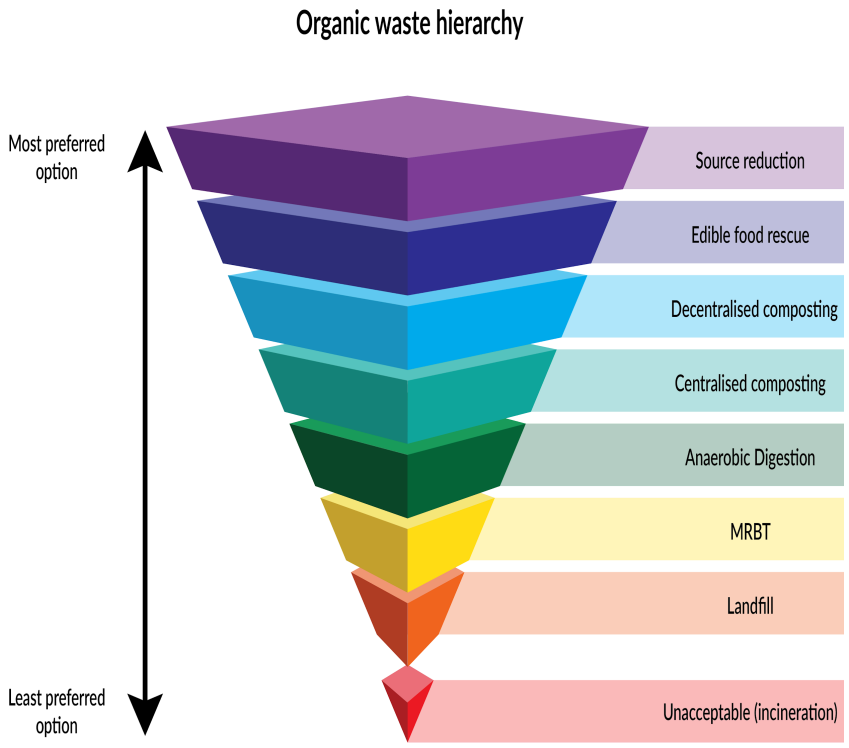
Some key regulatory and strategic opportunities to influence organics flows are coming up in the short term with the review of the Waste Minimisation Act 2008 and the 2010 New Zealand Waste Strategy, increases to the Waste Levy and and the associated action and investment plans. We need to use these to divert a large proportion of organics from landfill.

The Emissions Reduction Plan and the Circular Strategy can support and guide this work by aligning goals, requirements, investment and practice at the national and local scales. It is important that they both become strong drivers for maximising the amount of organic material being composted and returned to soil to support carbon sequestration as well as emissions reductions.

Policy guidelines and investment in organic waste infrastructure development must follow the waste hierarchy for organics, which prioritises prevention, redistribution, reduction, and local processing over tech-heavy, large scale infrastructure.[48] A local scale focus will give the best long term outcomes by creating multiple co-benefits that build local capacity and resilience. Creating pathways for diverting organics to return them to soils and avoid biogenic methane emissions from landfill is a key priority for circular infrastructure investment.

[47] https://takeawaythrowaways.nz/blog/is-compostable-serviceware-actually-safe-for-people-and-planet-part-one

[48] Apart from the benefits of reducing and redistributing edible food waste discussed elsewhere in our submission, see this useful discussion on choosing between composting and anaerobic digestion: https://zwia.org/composting-and-anaerobic-digestion-policy/



Waste Hierarchy for food and green waste - post consumer and post production[49]

48. What are your views of the potential proposals we have outlined? What work could we progress or start immediately on a circular economy and/or bioeconomy before drawing up a comprehensive strategy?

Regarding the proposals and what can be done in the meantime

We see a key role for the government in the circular economy space being to support and enable work that is already happening on the ground. This is in line with Economist Mariana Mazzucato's concept of "building a coalition of the willing". The other critical function is to create the regulatory framework that deliberately advantages enterprises and activities that reduce material flows and emissions and increase the circularity of our economy. (We discuss this in other questions)

Step 1 for us would be to take stock and build on what is already happening right now using the tools and resources the government already has at its disposal. Resources, attention and support need to be deliberately channeled towards enterprises and organisations that are on the circular path.

[49] Zero Waste Network stock image from file

When we reduce waste we reduce emissions so zero waste is climate action. Zero waste is the #1 tool in the tool box for reducing waste and doing this in a way that engages and empowers local scale action by communities and SME. It provides a philosophy, a toolkit and a destination.

Our members started using practical zero waste strategies to reduce waste and emissions, connect their communities, and build their local economies 30 years ago. They have built up a substantial body of knowledge and practise which they share across the Zero Waste Network to empower and enable other communities to get involved in meaningful and productive local scale enterprises and projects.

Our Para Kore and Zero Waste Network members, partners and stakeholders form the backbone of the zero waste movement in Aotearoa. The zero waste movement has provided the philosophical and practical foundations for the circular economy. Communities around the world are using zero waste as a vehicle to create resilience and wellbeing and to adapt to climate change. The Zero Waste Cities platform supports similar work across Europe.

Our network comprises a number of Zero Waste Hubs or Community Recycling Centres like Xtreme Zero Waste in Whāingaroa, Wastebusters in Wanaka and Alexandra, Sustainability Trust in Pōneke and the Auckland Community Recycling Centre Network. Members deliver practical

services and integrated behaviour change programmes. It also contains many SME and other organisations working in the zero waste and circular economy space.

Each site has deep connections into the local community and longstanding relationships with a wide range of SME and organisations. Many of whom are working towards zero waste or integrating zero waste and circular economy principles into their business models. Together they are working on waste reduction, reuse, recycling, events, composting and food resilience, behaviour change and awareness raising, product refinement, system change and collaboration across industry groups.

There are many opportunities to scale and replicate across these networks. We are working on a number of different projects that involve partnership approaches building on existing and developing relationships. A number of our members are working on different stages of projects to develop, operate or expand eco parks and zero waste hubs. All of this work involves piloting, prototyping and testing new working arrangements, contracting mechanisms, business models and funding and financing arrangements.

We need all the help and support we can get. If any of this work was properly resourced we could go so much faster and deliver so much more.

Zero Waste hubs underpin nationwide resource recovery network

All the goods, materials and packaging that flow out through the supply chain also need to flow back up the recovery chain so we can reuse, repair, recycle, compost etc. This is the missing piece in the thinking that created our waste problems in the first place. A Nationwide Resource Recovery Network is a critical piece of public infrastructure that needs to be built into the Circular Economy and Aotearoa Waste Strategies from the beginning.

We need to be able to do a great job of this so our export industries and tourism industries can prove they are doing the right thing in global markets. We also need to do it so we can hold our heads up high as citizens of Aotearoa knowing that our everyday activities at home and at work are increasing wellbeing.

We urgently need to develop an evidence-based long term approach to national resource recovery. This needs to go way beyond recycling to create a fully integrated resource recovery chain network. It would encompass: waste prevention, reuse, repair, refillables, composting, remanufacturing, closed loop recycling. It would look at competition between modes, ownership structures, regulatory regimes and the infrastructure investment required to improve the effectiveness and sustainability of New Zealand's recovery chains.

MfE are working on a long term infrastructure plan but we think it focuses too much on the recycling activities at the bottom of the waste hierarchy. To make the jump to a circular economy we need to move up into the prevention, reuse and composting layers where we can really make a difference.

Creating public assets

This is especially relevant to resource recovery where the goal is to transform the system over time so we shift to zero waste (just like we aim to do with zero carbon by 2050). Radical change will come across our sector over the next 30 years as corporates, governments and communities engage with the idea of increasing circularity.

Facilities and infrastructure need to be owned and operated by parties with an incentive and a desire to change the game and innovate over time. Big Commercial Waste companies have an interest in maintaining the status quo and this has stymied progress on resource recovery.

Land based assets with services, landscaping and buildings that can be converted to new uses over time are best put in the hands of purpose driven Māori, Pasifika and Community Enterprise operators through social procurement processes so that public opex funding and other revenue streams can be converted into a public asset base.

Local ownership generally ensures a wider range of interconnections, co-benefits and a long term view of the impact on the community, local economy and environment of enterprise activity. It is critical that we build diversity in the supply market to grow innovation, opportunity and capacity as well as local multiplier effect.

Ownership and operation by local scale operators is especially important in customer facing activities as service delivery and behaviour change are intertwined. Service users can get advice and support to up their game when the operators with the right approach, knowledge, experience and incentive are running facilities.

Establish a baseline

Measures that help us understand the level of circularity in our economy are more useful than just counting tonnes of waste and recycling falling out the bottom. Sound base data is required to generate both types of analysis. We recommend continuing to develop and refine material flow analysis and consumption emissions accounting which give different insights to production based emissions accounting.

We need to go up supply chains to understand the material flows and emissions consequences of production and consumption decisions. Material flow accounts, consumption emissions accounts, waste composition data and attitude and behaviour surveys need to be developed as soon as possible to create a more holistic and timely picture of relevant trends and patterns. These tools are already being used by other countries.

Material flow analysis

Circularity can be measured through Material Flows Analysis. Countries like Scotland do this already. This tells us how many tonnes of raw materials are being fed into the economy. It can also

be used to create a circularity index - e.g. global economy is 8.6% circular and needs to be about 17% if we are going to stay within 1.5 degrees of warming.

If the goal is to create a circular economy the most useful thing to track is the level of circularity. First establishing a baseline, then monitoring change over time. The information in the materials flows analysis will pinpoint 'hotspots' where material use and emissions are high. This flags productive places to intervene in the supply chain to reduce both waste and emissions. It supports decision making and creates a data series over time.

It is possible to measure the degree of circularity in an economy at the city, region, national and global scale. Circle Economy creates an annual Circularity Gap report, the 2021 calculations put the global economy at 8.6% circular (more than 90% linear). A set of Material Flow Accounts underpins their circularity analysis which maps out the way that fossil energy sources, minerals and ores and biomass are combined to create goods and services.

Amsterdam has set a target to reduce the use of raw materials: *By 2030, there must be a 50 percent reduction in the use of primary raw materials.* They recognise that the fewer virgin raw materials that flow into the economy the less damage to ecosystems and biodiversity loss is caused by extraction. The longer materials and products stay in circulation the fewer raw materials are required to make new items. So they are focusing on the inputs as well as the outputs of their production and consumption system.

Measuring the flow of materials through the economy shows the materials efficiency and can be related to GDP or population. Scotland uses multiple sources of information to create a round picture of material flows and emissions generation through the economy including Materials flow Accounts, waste composition carbon analysis and other data to support decision making. By way of example recent Material Flow Accounts show that Scotland has a material flow baseline of about 18 tonne per person per annum with sustainable material flow estimated to be about 8 tonne per person each year. Holland, Norway and Finland all keep material flow accounts.

Scotland is a country with a similar population to New Zealand and a slightly different emissions profile. 80% of Scotland's carbon footprint is from production, consumption and waste of goods, services and materials. Zero Waste Scotland works across the board to implement zero waste, resource efficiency and emissions reduction strategies to create a circular economy. The focus is on building capacity and relationships across supply and recovery chains to support everyone to play their part.

The Scottish Government believes a circular economy is the key to reducing both waste and emissions. Their landmark 2016 strategy, Making Things Last,[50] highlighted the economic, community and environmental benefits of making the shift. Scotland uses and develops tools for measuring flows of materials and energy through the Scottish Economy.

[50] The Scottish Government (2016) *Making Things Last: A circular economy strategy for Scotland* (Edinburgh: The Scottish Government). Retrieved from https://circulareconomy.europa.eu/platform/sites/default/files/making_things_last.pdf.

They use two data sets in tandem to monitor progress.

1. A detailed national material flows account - Recently the first Scottish Material Flow Accounts[51] were published. These show the *"inextricable relationship between what Scotland consumes and it's global climate impact"*.
2. Scotland's carbon footprint - Carbon footprinting measures consumption emissions[52] to show the onshore and offshore carbon impact of consumption and production.[53]

Emissions are being measured in two different ways in Aotearoa

Production emissions accounting measures emissions generated within Aotearoa. The use of a production basis for emissions accounting means Waste emissions only include methane released by organic material in landfills. We support this being measured and reported on as it supports achievement of our emissions reductions targets under the Zero Carbon Act.

Consumption accounting frameworks measure emissions generated to provide all the goods, materials and products consumed by New Zealand households, businesses, other organisations and Government. This includes emissions on imported goods. Stats NZ already collects and analyses data on the carbon footprint of Aotearoa from a consumption perspective.

The two types of accounting are complementary and shine a light on different aspects of the system just like a profit and loss and a cash flow report on money flows through a business in different ways. Both production and consumption emissions should be tracked, reported on and used in decision making and behaviour change work. The methodologies for creating the data should be refined and developed over time to increase confidence in the data series.

Tracking consumption emissions is a useful way of tracking the carbon footprint of onshore consumption. It is a proxy for the carbon intensity of consumption across Aotearoa and we would expect this to drop over time.

If we don't track consumption emissions there is a risk that we will achieve emissions reductions by offshoring manufacturing and other high carbon activities rather than by decarbonising in absolute terms. Tracking and reporting on consumption emissions keeps the focus on the responsible production and consumption story which supports delivery of SDG 12.

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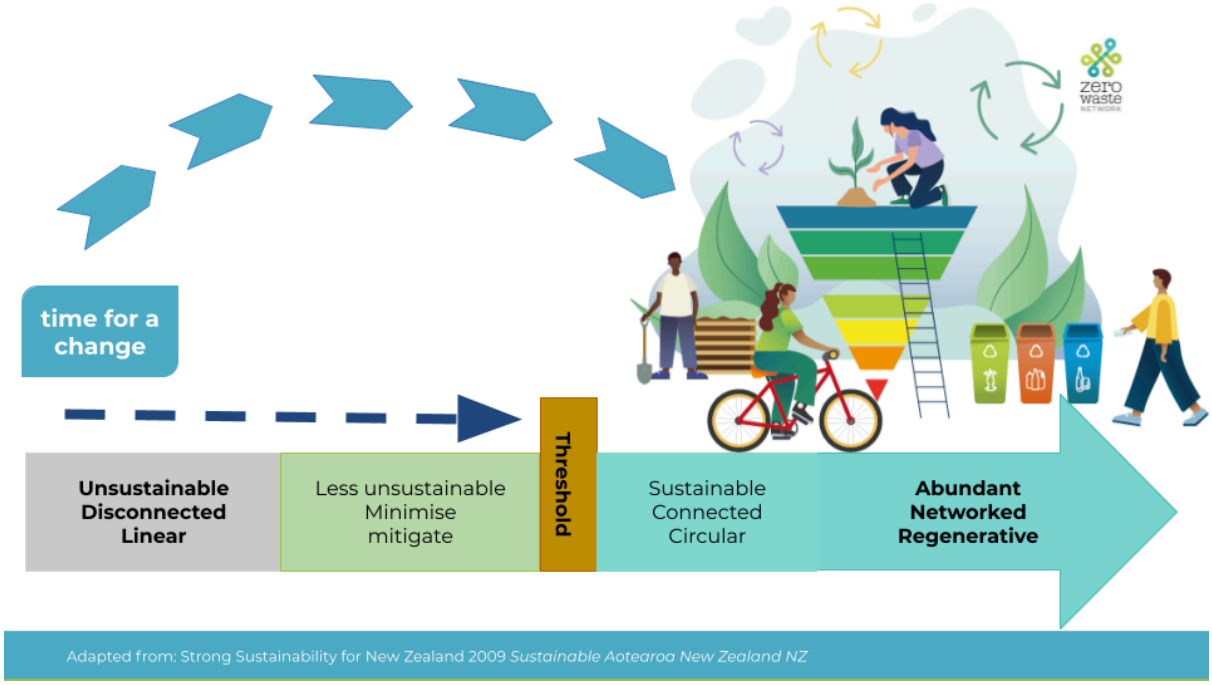
[51] https://www.zerowastescotland.org.uk/research-evaluation/material-flow-accounts-mfa
https://www.zerowastescotland.org.uk/press-release/true-size-scotlands-raw-material-consumption-footprint

[52] Nwabufo, Chidubem and Warmington, Jamie (2020). 'Measuring Scotland's progress towards a circular economy to help combat the climate emergency. Results from a preliminary scoping study reviewing key indicators.' Edinburgh: Zero Waste Scotland. Retrieved from https://www.zerowastescotland.org.uk/sites/default/files/Branded%20Report%20MetricsV1.pdf.

[53] See various resources on the Zero Waste Scotland website: "Scotland's Path to Net Zero" at https://www.zerowastescotland.org.uk/netzeroplan; "What is the Carbon Metric?" at https://www.zerowastescotland.org.uk/our-work/what-carbon-metric; and "Carbon Metric Publications" https://www.zerowastescotland.org.uk/our-work/carbon-metric-publications. See also ACR+ "More Circularity, Less Carbon". Retrieved from https://www.acrplus.org/en/morecircularitylesscarbon.

Creating an enabling agency for Circular Economy (and Zero Waste)

One reason we are not making much progress on waste and emissions is that we haven't really changed the way we do things. We can solve complex problems if we take a systems approach and innovate across the board to achieve outcomes we all agree are worthwhile. To do that we need to go beyond goals and objectives. We need a Mission that we can all get behind.



Economist Mariana Mazzucato[54] points out that Governments are the only entities with the capacity to drive change on the scale we need to tackle the big issues of our time. She argues that by taking the lead to catalyse collaboration across sectors, the Government can 'crowd in' solutions and investment by all types of organisations to solve key problems.

The Climate Commission put increasing the circularity of the economy into a more prominent position in its final advice[55] to the Government. They recognised the "potential of a circular economy to reduce emissions across the economy and generate numerous social, environmental and economic co-benefits."

Transitioning to a circular economy is a major transformation that requires a coordinated approach. The Climate Change Commission recommended that to deliver a circular economy strategy "clear governance structures would need to be established" (p.251), which should include "tasking a minister and lead agency to assess and implement actions for a more circular economy."

[54] Mazzucato, M 2021 Mission Economy a moonshot guide to changing capitalism

[55] Climate Commission Inaia- tonu-nei: a low emissions future for Aotearoa section see 13.4 page 250

At the moment MBIE and MfE are both playing a role in leading work on the circular economy. MBIE seems to be focusing on the supply chain, MfE on the recovery chain and waste. MfE has a massive amount of policy and regulatory work to do over the next few years to design, deliver and embed the changes proposed in the waste strategy and legislation review. MBIE is in a similar position.

There is a need for an agency dedicated to the circular economy, resource efficiency and conservation, to reduce silos, build a shared understanding, and enhance coordination.[56] The need for an agency focused on resource efficiency was recognised at the time EECA was established[57] and the opportunity cost of not having it in place is obvious in our lack of progress with waste reduction over the last 20 years.

To achieve a timely and successful transition to the circular economy, MfE needs to work with MBIE to:

- create a new independent agency dedicated to the circular economy and zero waste to implement the work programme and create an enabling environment for operators.
- devolve responsibility and resources to enable the new agency to support and coordinate the local authorities, enterprises and civil society organisations that already work in the emerging 'circular economy' space. This will enable and empower these organisations to bring the circular economy to life through their actions in the world.

What would this look like in practice?

We need an enabling agency for circular economy and zero waste - like an EECA for materials and resources. It would be a mechanism for turning government thinking and policy into action and a means of feeding knowledge and understanding gained through experience in the world back in to guide the next iteration.We imagine it would be established as a public benefit entity, crown agents give effect to policy and have a responsible Minister. A Minister with portfolio responsibility for small business, climate change, biodiversity, and community economic development would be an ideal lead.

The agency could support and enable all the people and organisations already working on zero waste, repair, reuse, refill, composting and closed loop recycling and other forms of resource recovery to cooperate and work more effectively together. Creating an enabling ecosystem would support existing players and startups to pilot, expand, replicate and share knowledge. Resourcing for business advisory services, peer support, organisational capacity and capability

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56 https://theconversation.com/nzs-government-plans-to-switch-to-a-circular-economy-to-cut-waste-and-emissions-but-its-going-around-in-the-wrong-circles-170704

57 See early calls for agency in 2003 in Warren Snow and Julie Dickinson (2003) Getting There! The road to zero waste (Auckland: Zero Waste New Zealand Trust). Accessible at https://www.entrust.org.nz/wp-content/uploads/2021/07/Getting-there-The-Road-to-Zero-Waste-FINAL-2003-low-res-ebk.pdf, p.36. A Waste Authority was written into the original Waste Minimisation Bill, but removed in Select Committee phase. Most recently, the call was made again in Sarah Pritchett and Sunshine Yates (2020) Recommendations for Standardisation of Kerbside Collection in Aotearoa (Prepared for the Ministry for the Environment by WasteMINZ, May 2020). Accessible at https://www.wasteminz.org.nz/wp-content/uploads/2020/08/Final-1.0-Standardising-Kerbside-Collections-in-Aotearoa.pdf, p.39.

building could be channelled through this agency but most of the services would be provided by experienced players who already exist in the ecosystem.

With the Waste Levy increasing over the next few years we have the budget to invest in this kind of work for the first time ever. The Waste Minimisation Fund along with the Circular Economy pilot fund would be enough to get the new Circular Economy Agency off to a good start. Other appropriations could be accessed to develop the scope and work programme over time in the same way as EECA programmes are funded.

We suggest allocating the WMF funds by sector to ensure a fair proportion of the fund goes into the local scale through councils, SME, social enterprise, māori and pacific enterprise, community enterprise, industry organisations like Wasteminz and the civil society organisations which are leading the way on community led behaviour change and action projects. These numbers are based on the projected levy rate which would see approx $275m available for investment in 2024.

<table>
<tr><td>Govt</td><td>Local Govt</td><td>Enterprise</td><td>Civil Society</td></tr>
<tr><td rowspan="2">$30m Compliance, enforcement and monitoring and data.

$ 40m Opex for the New Agency</td><td>$70m</td><td>$70 m</td><td>$70m</td></tr>
<tr><td colspan="3">New Agency would be responsible for distributing funds - Each sector's allocation would be further divided into ‘buckets’ for specific work programmes, pilots, infrastructure investment etc as determined through collectively agreed 5 year Action and Investment plans (like Industry Transformation Plans.)</td></tr>
</table>

Some good examples of overseas independent agencies that have developed to perform this role are WRAP, Zero Waste Scotland and Sustainability Victoria. They work as stepping stones to embed circular economy thinking and have been making good progress on reducing waste and emissions. The new Circular Economy and Zero Waste Agency would work as an intermediary that sits between Government and the diverse range of players working in the resource recovery and zero waste space.

Main activities of the agency would be:

Ecosystem development, knowledge transfer and networking.

- Hold the Circular Economy baby and help to get it embedded through Govt agencies and research and academic institutions through multi disciplinary team secondments.
- International relationships - working with others to leverage one anothers IP - eg. Circle Economy, Ellen MacArthur Foundation, Zero Waste Europe.
- Bring all the parties stakeholders around the table to do the Industry transformation work which would be embedded in 5 year action and investment plans.

Applied research and development

- Work on innovative measurement - support consumption emissions and materials flow accounts development to get insights into system function so can shape change
- Insights, processes, systems, behaviour change
- Thought leadership, learn and share, take and enable direct action
- Integrate practical wisdom, mātauranga, science and social science

Enterprise development and capacity and capability building

- Culture and operating environment, technical and business systems
- Purpose driven business models - Social, Māori and community enterprise
- Resource Training, professional development,

Coordinate and resource innovative behaviour change

- Centre enables - local scale delivers model
- Hearts and minds - support existing and local scale organisations that connect directly with local communities

Reimagine the policy and regulatory framework

- Product stewardship - Innovate to drive change across value chains
- Support Government and local government - policy, research, advice, good practise

Do the thinking around how to make the economics work

- Economic instruments to resource Circular Materials flows - adf, eco taxes, levies, handling fees.
- Innovative social procurement, contracting models. Eg Network operators for Product Stewardship schemes.
- Invest, Allocate and administer WMF funds to support (plus targeted appropriations?)
- recommendations to Government on policy and regulatory levers

In Aotearoa EECA performs a similar role for renewables, energy efficiency, reducing energy consumption. Callaghan Innovation provides a similar role for ecosystem development, capacity building and innovation and commercialisation with a focus on science and technology. We would like to see an agency developed that combines the best features of two entities. The primary goal of the agency would be to get resources into the hands of actors working on bringing the circular economy to life.

We imagine the relationships working something like this.

<table>
<tr><td>Government
Multi agency interest e.g.:

MfE - Waste and Resource Efficiency team

MBIE - circular economy team

MPI - bioeconomy?</td><td>Circular economy and zero waste agency

(Like an EECA for materials)

Intermediary sitting between Government (Macro) and operators (Micro)</td><td>Local authorities

Enterprises:
Corporate
SME
incl
Māori enterprise and other purpose driven enterprise

Civil Society</td><td>Citizens in their roles as:
Ratepayers
Customers
Community members
Whānau

Experience ‘Circular Economy’ through their relationships with Local Authorities, enterprise and civil society</td></tr>
<tr><td>Regulatory frame
Policy</td><td>Enables
Implementation</td><td>Organised and collective action</td><td>Individual action</td></tr>
</table>

The new Agency would have a governance model grounded in Te Tiriti-based partnership, embedding a mātauranga Māori approach and enabling Māori collectives to participate in associated business opportunities as the Climate Commission recommended[58]:

Accelerate the uptake of Bio-energy

We note that demand for biological resources outstrips supply. This will become more of an issue as organic materials are used to replace fossil fuels in process heat applications. A critical role for the Government will be around allocation of these scarce resources to highest and best use. Competing demand will increase the value of these resources making it more likely they will be grown and supplied but it is also likely to put pressure on resource stocks. We suggest developing a clear prioritisation framework to support good decision making in this area (e.g. see question 46).

Knowledge and education and Behaviour change

See our response to Q42-44

Sector specific

We appreciate the effort that the building for climate change team is putting into understanding and working with the concept of consumption emissions and embodied energy. We would love to see them sharing what they have learned with other agencies and sectors to support a wider understanding of this.

[58] Recommendation 14 Increase the Circularity of the Economyp252 (Recommendation 15 covers the parallel bioeconomy.)

49. What do you see as the main barriers to taking a circular approach, or expanding the bioeconomy in Aotearoa?

Fundamentally transforming the way we do things

The main barrier is that we are stuck in a rut. We have been talking about sustainable development since the Brundtland Report came out in 1987. It shone the spotlight on the tension between economic development, environmental protection and social equality. It name checked biodiversity loss, water issues, global warming, resource consumption and doing 'more with less'.

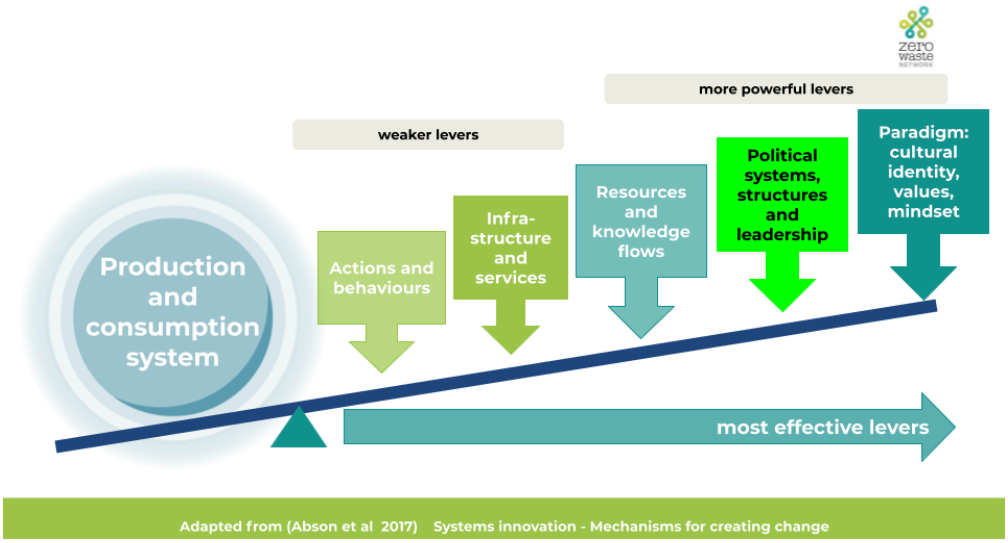
It pointed out that we live in a finite world and flagged the risks posed by an economy focused on infinite growth. It's definition: 'Sustainable development is development that meets the needs of future generations without compromising the ability of future generations to meet their own needs" made it clear that we have an obligation to behave fairly, not just to the people and other life forms we share planet earth with now, but all those that are yet to come.

The Brundtland Report challenged us to be good ancestors. It echoed the Te Ao Māori approach that has been practised by tangata whenua for many generations. Countries all over the world have struggled to turn this thinking into action on the ground. The pressure is on to make a big shift in the next ten years. We have to pull all the levers we have available.

Circular Economy is a powerful reframe

Shifting our economic paradigm from Linear extractive to Circular regenerative requires a major change in mindset. Systems innovation theory[59] sees mindset shift as the most powerful lever for creating change. The idea that culture change underpins system change is a key feature of strategies and legislation designed to drive a shift towards circularity.

[59] See this article for the basic idea https://donellameadows.org/archives/leverage-points-places-to-intervene-in-a-system/



One of the key barriers to creating a circular economy in New Zealand is that the system conditions are set up in favour of linear practices. Transitioning to a circular economy requires a major regulatory, policy, financial and economic reset.[60] Government needs to step up, show leadership and establish the policy instruments and regulatory framework that advantages circularity over linearity.

For example, bolder use of regulatory tools and economic instruments generally, as well as in the context of product stewardship schemes. To date, the political will to do this has not been forthcoming.[61] The continued timid approach towards producers is starkly apparent in the recently released consultation document on the waste strategy and legislation,[62] and in the approach to designing product stewardship schemes.[63] (See our discussion of Product Stewardship tools in Q50)

Making the economics work

The new waste strategy is meant to drive a 'strategic investment approach for WMF funds' but it doesn't have a coherent story about money yet . Making the economics work is a critical piece of

[60] OECD Urban Studies (2020) "The role of national governments in supporting the transition to a circular economy" in The Circular Economy in Cities and Regions: Synthesis Report. Accessible at https://www.oecd-ilibrary.org/sites/724e5c45-en/index.html?itemId=/content/component/724e5c45-en#section-d1e22491.

[61] See, for example, Parliamentary Commissioner for the Environment (PCE) (2006) Changing behaviour: Economic instruments in the management of waste. Wellington: PCE. Accessible at https://www.pce.parliament.nz/media/pdfs/changing_behaviour.pdf ; Jonathon Hannah (2018) (Un) Changing Behaviour: (New Zealand's delay and dysfunction in utilising) economic instruments in the management of waste? (Submission to the Parliamentary Commissioner for the Environment prepared on behalf of the New Zealand Product Stewardship Council). Accessible at https://nzpsc.nz/un-changing-behaviour-new-zealands-delay-dysfunction-in-utilising-economic-instruments-in-the-management-of-waste-an-open-submission-to-the-new-parliamentary-commissioner-for-the-en/ ; Hannah Blumhardt (2018) "Trashing Waste: Unlocking the Wasted Potential of New Zealand's Waste Minimisation Act Policy Quarterly 14(4).

[62] https://theconversation.com/nzs-government-plans-to-switch-to-a-circular-economy-to-cut-waste-and-emissions-but-its-going-around-in-the-wrong-circles-170704

[63] Blumhardt (2021) "Foxes Guarding the Hen House? Industry-led design of product stewardship schemes" Policy Quarterly 17(2). https://doi.org/10.26686/pq.v17i2.6825

the work programme. The Circular Strategy needs to prioritise multi-disciplinary work to explore the wider finance and funding options.

We desperately need some clever thinking around how to make the economics work. We note that the strategy does not have a section on financing and funding the transition or any analysis of the capex and opex flows required to resource the new system. This work needs to be done.

Funding and financing

It is reasonable to expect that the opex and capex costs associated with infrastructure required to recover materials and products is funded through user charges like advance disposal fees and eco taxes. These systems need to be provided as a public good since no one producer has the scale or the incentive to supply a comprehensive system for everyone to use (free rider problem). But the cost should be recovered in full from user charges rather than an indirect tax or rate on the general public.

At the moment rates and taxes that fund waste management and resource recovery systems subsidise the business models of high materials throughput commerce - single use packaging, wasteful supply chain practises, fast fashion, lack of durability in consumer goods, low quality products, wasteful practices on construction sites etc

Creating user pays mechanisms that ensure those that benefit from the sale of products (producer and consumer) cover the real cost of waste management and resource recovery services will be necessary to meet public expectations about end of life handling eg. packaging, textiles, e-waste.

Securing a social licence to produce and sell packaging and products needs to depend on responsible production strategies like durability, right to repair, reusability, closed loop recyclability etc in the near future. Global and national pressure is shifting attitudes and driving business practises, regulation and legislation around the world. A strong regulatory framework and a toolkit of economic instruments is required to underpin this shift. See also our response to question 26.

50. The Commission notes the need for cross-sector regulations and investments that would help us move to a more circular economy. Which regulations and investments should we prioritise (and why)?

Fundamental role of Zero Waste and the Waste Hierarchy

The Waste Hierarchy is a critical tool for prioritising action and investment. More recycling is the easy answer but it keeps us focused on the stuff coming out the end of the pipe. If we are serious about reducing throughput of materials and energy we need to go back up the pipe and change what is getting put in at the top.

The Waste Hierarchy puts activities in order based on the impact they have on waste generation. In simple terms it is best to reduce waste at source and to reuse goods and materials for as long as

possible. It is good to use closed loop systems to recycle materials and compost organics. Downcycling, landfill and waste to energy are a last resort when we run out of good ideas.

The Waste Hierarchy needs to be embedded in the Waste legislation so it becomes the key driver in decision making about how to operationalise circular economy principles.

Australia's National Science Agency CSIRO[64] is developing a Circular Economy Roadmap. They consider building a national zero waste culture to be one of three primary enablers of the shift to a circular economy: "*Every channel should be used to support that vision, to change mindsets and guide behaviours both at home and at work*[65]. CSIRO sees the responsibility for making the shift to a circular economy shared across all participants

When framed from the perspective of the problem (waste) rather than the solution (zero waste and circular economy strategies) it is easy to miss the potential for the zero waste and resource efficiency sector to achieve emissions reductions. The marginalisation of zero waste and circular economy strategies in climate policy and analysis is the subject of a growing body of research locally and internationally.[66] This is being addressed in many jurisdictions with recognition that zero waste strategies like prevention, reuse and repair play a key role in reducing upstream emissions.

If recycling is the Answer, we are asking the wrong Question!

The Waste Hierarchy with its focus on prevention, reduction and reuse sees recycling as a last resort rather than a first port of call. Demand management is a critical tool that can be applied in Circular Economy thinking to limit the amount we need to spend on services and infrastructure to manage and dispose of materials and products we no longer want.

Reducing material flows will reduce demand for landfills, collection systems, processing systems, litter and other cleanups. Durability, right to repair and systems that support reuse and refillables will reduce demand by slowing down flows. Eliminating unnecessary items and toxic materials and chemicals will reduce clean up costs. Less material in landfills reduces cost of aftercare in perpetuity and the need to consent and build new facilities.

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[64] CSIRO 2021 A Circular Economy Roadmap for Plastics, Glass, Tyres and Paper. Retrieved from https://www.csiro.au/en/research/natural-environment/Circular-Economy

[65] CSIRO 2021 Circular Economy Roadmap Summary p5

[66] Ballinger and Hogg (2015) *The Potential Contribution of Waste Management to a Low-Carbon Economy* (Bristol, UK: Prepared by Eunomia Research & Consulting for Zero Waste Europe). Retrieved from https://zerowasteeurope.eu/downloads/the-potential-contribution-of-waste-management-to-a-low-carbon-economy/; Ellen MacArthur Foundation (2019) *Completing the Picture: How the Circular Economy Tackles Climate Change.* Retrieved from https://www.ellenmacarthurfoundation.org/publications/completing-the-picture-climate-change; Julie Hill, Patrick Mahon and Peter Maddox (2020) "How can a circular economy help us meet net zero?" *Environmental Scientist* February issue; Maggie Clarke (2 December 2020) "Consumption, Climate, Zero Waste, and the Green New Deal" (Presentation at the National Recycling Coalition's Zero Waste Conference 2020). Retrieved from https://nrcrecycles.org/2020-national-zero-waste-conference-webinar-recordings/; Maggie Clarke (2012) "The Importance of Zero Waste in Climate Action Plans" (Paper 2012-A-484-AWMA). Retrieved from http://www.maggieclarkeenvironmental.com/AWMA2012-The-Importance-of-Zero-Waste-in-Climate-Action-Plans-Paper-484-v.2.pdf; Brenda Platt, David Ciplet, Kate M Bailey and Eric Lombardi (2008) *Stop Trashing the Climate* (Institute for Local Self-Reliance, Eco-cycle and GAIA). Retrieved from https://ilsr.org/stop-trashing-the-climate/; Material Economics (2018) *The Circular Economy - A powerful force for climate mitigation: Transformative innovation for prosperous and low-carbon industry* (Stockholm: Material Economics Sverige AB). Retrieved from https://www.sitra.fi/en/publications/circular-economy-powerful-force-climate-mitigation/.

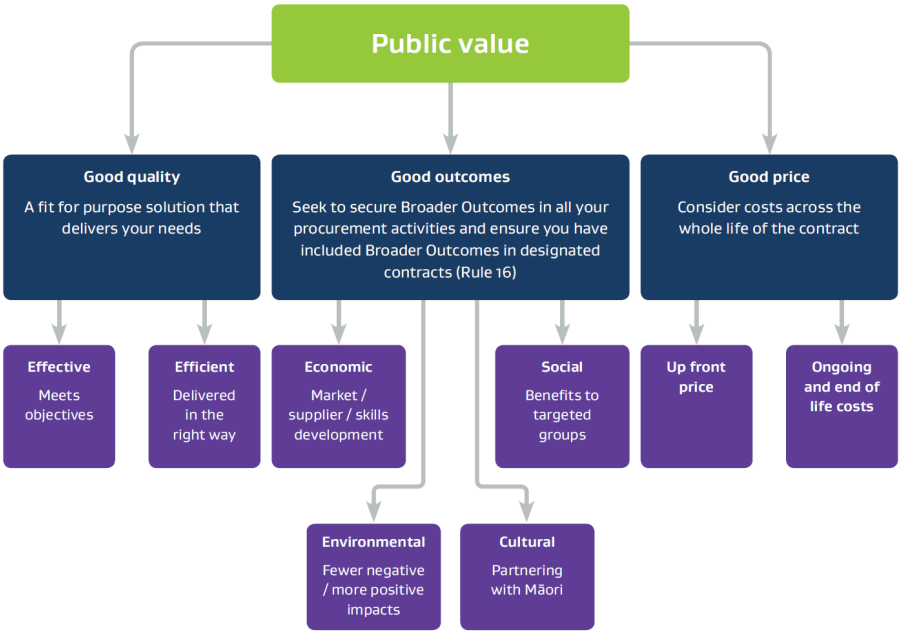
The Infrastructure Strategy makes a good start on this with it's recognition for the need to:

- make the best use of what we have
- explore non built solutions to infrastructure problems
- generate co-benefits through infrastructure investment and
- use hard and soft infrastructure to generate wellbeing outcomes.

Circular Procurement

Work needs to be done to integrate thinking and practise around how we can use spending and procurement to support the transition to a circular economy. The New Zealand Government Procurement Rules (rules for sustainable and inclusive procurement) v4 were updated in 2019. The rules outline the concept of Public Value and how it can be achieved. The rules create an obligation for Central Government agencies to use their purchasing power to achieve broader outcomes when they buy goods and services.

The focus is on delivering 'public value' through procurement processes. Public value accrues when purchasing decisions are made that satisfy the requirement to achieve three goals at the same time: good quality, good outcomes and a good price.



The work that has been done on the Government Procurement Rules[67] contains some useful framing. It helps us think about the relationship between effectiveness and efficiency, up front and whole of life costs and how we can create mutually reinforcing co-benefits that deliver desired outcomes. Work needs to be done to understand how this Framework would be implemented to

[67] https://www.procurement.govt.nz/assets/procurement-property/documents/government-procurement-rules.pdf

support a circular transition. Guidance and support needs to be provided circularity becomes a key consideration in the procurement process as well as the implementation and operational phases of contracts.

This work needs to include supporting LocalGovernment to work through what circular economy means at the local and regional scale. The Local Government (Community Well-being) amendment act 2019 has reinstated the concept of wellbeing into the purpose, principles, decision making process, and the definition of community outcomes. This creates a solid platform for local communities to determine the outcomes most important to them. These outcomes can be used as 'goal posts' by council and community to guide future investment, budget allocation and purchasing decisions. The ways that transitioning to a circular economy aligns with and supports community priorities and helps to build strong and revitalised regions needs to be clarified and embedded in LocalGovernment practise.

The use of a strategic social procurement approach gives central and local government, Māori, communities and enterprises a mandate to explore new ways of working together to co-create circular economy practise. Social procurement has been essential to the development of the Auckland Resource Recovery Network which is a key initiative for delivering on Auckland Councils Waste Minimisation and Management Plan.

It also supports the delivery of the Council's Low Carbon and Social Development Action Plans. Resource Recovery and waste reduction are key components of the Circular Economy. This connection is recognised at the local scale eg. the Southern Initiative's vision of Creating shared prosperity through the Circular Economy. The Zero Waste Network has been involved in working alongside councils and communities to establish and operate community recycling centres which operate as Zero Waste Hubs providing both practical reuse, repair and resource recovery and behaviour change services. (see our discussion regarding the development of a nationwide resource recovery network above.)

Product Stewardship - critical circular economy enabler

There is a disconnect between the supply chain which pumps out our stuff and our recovery chain which (in theory) gathers it all back up and sends it around again to be reused, repaired, remanufactured or to become recycled content in new products or compost for our soils.

The companies that make products and materials have no obligation to consider what will happen to it at the end of it's often too short life. This is starting to change. The social licence to operate for businesses with high waste, high emissions models is coming into question.

Government has an important role to play in establishing the regulatory framework to align business practise with public expectations and planetary and social boundaries. The way responsibilities are allocated across government departments creates disconnects eg. MBIE looks after the Supply chain side, MfE looks after the resource recovery and waste side. MBIE looks after enterprise activity, MfE looks after environmental protection. Product stewardship tools

have the potential to integrate thinking, policy, regulation and action across value chains. It enables us to think about how we can minimise extraction, maximise the use value and minimise 'leakage' (waste, pollution, emissions).

Product stewardship describes an emerging set of tools to manage and fund the movement of products and materials through supply, use and recovery chains. It brings the circular economy to life by sharing responsibility for products over their whole lifecycle. This is in line with SDG 12 which aims to create more responsible production and consumption systems.

Effective product stewardship drives the redesign of business models and products shifting them up the waste hierarchy. It is a fair way of allocating responsibility to the industries and companies that are producing the goods and materials in the first place. We would expand and develop product stewardship to make the best use of this powerful tool for reducing material flows and emissions and covering the real costs associated with resource recovery systems.

Product stewardship interventions designed to reduce material and energy consumption would trigger significant shifts in business and economic practices. We think product stewardship should be normalised and applied to all products in our economy, not just 'problematic' products.

Focusing on specific classes of products (i.e. high emissions potential or toxicity) misses product stewardship's potential as a key tool to incentivise and guide product redesign in order to circularise our economy for all material flows and consumption patterns. This would ensure the recovery chain gets as much attention and investment as the supply chain.

The design and implementation of product stewardship requires an overhaul if schemes are to meet our waste and emissions reduction expectations. The government's current approach to mandatory product stewardship is for industry to lead 'co-design' of schemes for priority products. It does not make sense to us that the regulated party should get to create the terms of its own regulation. Industry has a vested interest and often benefits from the status quo. There is little incentive to foreground community or environmental interests[68].

Product stewardship should be led, designed, monitored and enforced by the government, not industry. Government should provide neutral facilitation and oversight of the scheme design process. Such oversight recognises that properly designed product stewardship schemes are a public good necessary to reverse the harm caused by economic practices that externalise social and environmental costs.

The OECD's[69] work on how national governments can support the transition to a circular economy details their thinking on regulatory, financial and economic instruments that would support the

[68] Securing social license to operate is more likely to be a greenwash exercise than a real shift in impact.

[69] From OECD Urban Studies (2020) "The role of national governments in supporting the transition to a circular economy" in The Circular Economy in Cities and Regions: Synthesis Report. Accessible at https://www.oecd-ilibrary.org/sites/724e5c45-en/index.html?itemId=/content/component/724e5c45-en#section-d1e22491.:

transition to the circular economy. They emphasise the importance of getting the right policy and regulatory frameworks in place at all levels to drive
eco-design of products in order to increase material efficiency or circularity.

The OECD[70] make the following observations. They provide useful starting points for thinking about how we could be more ambitious and creative with our use of regulation to support the transition in Aotearoa. The points below have been lifted from their document. The OECD (2016[29]) calls for applying mixes of policy instruments to ensure a coherent set of incentives for resource efficiency along the product value chain.

Extended producer responsibility (EPR) schemes can increase incentives for eco-design.

- Eco-design regulations should go beyond energy-related areas and consider materials and typology of products in a broader perspective (Ekins et al., 2020[26]).
- It is important to correct misleading incentives, remove harmful subsidies and count environmental externalities in the pricing. (OECD (2016[27]))

Taxation of emissions and natural resource consumption is a useful tool for reducing extraction and resource use and shifting tax regimes to tax 'bads' rather than 'goods'. It makes sense to us to tax resource use and consumption rather than work and enterprise.

- Taxes on the extraction or use of natural resources are rarely implemented. When they are (e.g. Denmark, Sweden and the UK), they are often too low and have limited effects on encouraging more efficient resource use and recycling of secondary materials (Söderholm in Ekins et al. (2020[26])).
- Directing tax incomes to lighter taxation of employment and entrepreneurship would greatly facilitate and enhance the transition, as well as identify subsidies with harmful environmental impacts (Wijkman, 2019[18]).

Environmentally related taxes are increasingly being used in OECD economies and can provide significant incentives for innovation, as firms and consumers seek new, cleaner solutions in response to the price put on pollution. These incentives also make it commercially attractive to invest in R&D activities to develop technologies and consumer products with a lighter environmental footprint.

Some of the tools available are:

- environment-related taxes, fees and charges (increase the cost of polluting products or activities)
- tradable permits (used to allocate emission or resource exploitation rights)
- deposit-refund systems (places a surcharge on the price of potentially polluting products and is refunded when returned successfully, avoiding waste generation) (OECD, 2020[28])."

[70] We have left the original references for the points in the text so you can find them in the OECD doc if you wish to look into this further.

The work being done by MfE on priority products is necessary but not sufficient. We need to radically expand both our knowledge about how product stewardship and economic instruments can be used to drive the transition to circular models. And we need to Implement these so they have a direct effect on behaviour and decision making.

Technology change

This has big implications for resource recovery. Connectivity is critical for all the new developments in materials handling across supply and recovery chains. This needs thought and investment.

- Technology will play a big part in traceability by tracking material and product flows as part of the evidence base for circularity. Already being used for chain of custody, audit trails, material content, emissions profiles. This will only get more sophisticated. Transparency of environmental impacts of products through data. Block chain for tracking products and materials across the lifecycle.

- Data is a big deal for the materials recovery sector - new forms of measurement and tracking will be important for securing payment for services from various revenue sources, and tracing materials (and emissions) flowing through systems. Monopolies in many parts of the country create issues for data gathering as regional materials flow data is considered by large operators to be critical business information that they do not want to share with competitors. One solution to this is to ensure a competitive, and diverse supply market in each region. Another is to use data collection systems that aggregate to disguise regional patterns but the question has to be asked whether this best serves the public interest.

- Tracking products and following money flows (eg deposits and advance disposal fees) through product stewardship schemes for containers or E-waste eg. Eg. Reverse vending machine technology for container return schemes - return deposits to consumers, track materials to return handling fee to recycler etc.

- Also important for allocating producer fees back to relevant suppliers for the proportion of a certain material, eco taxes per unit for single use packaging etc

- Enable sharing programmes to operate like tool sharing, car sharing apps etc And leasing programmes like clothes leasing, appliance leasing which are ways to ensuring durability of goods.

- Collective sharing of businesses methodologies across networks to replicate services in multiple communities, benchmark and compare performance to support continuous improvement etc

51. Are there any other views you wish to share in relation to a circular economy and/or bioeconomy?

The circular economy is the opportunity to take proper responsibility for our global share of emissions when it comes to material consumption. We need to do our fair share as a wealthy developed country, which means reducing consumption of goods produced elsewhere that place a higher emissions burden on others.

Transitioning key sectors

Transport

57. Are there any other views you wish to share in relation to transport?
The challenge in considering transport journeys re 'waste' is that the big picture needs to be taken into account so that good decisions can be made. Decarbonising transport makes sense but it makes even more sense to eliminate unnecessary journeys.

Using electric rubbish trucks sounds like a good idea at first. If they are used to collect ever increasing quantities of waste that has had a very short useful life and has both an embodied energy and associated carbon footprint, it's really just another way of making us all feel better about the rubbish and recycling we are creating. It would be better to do away with the single use packaging, fast fashion, cheap junk consumer goods etc and not have to move them to landfill in the first place.

Building and construction

70. The Commission recommended the Government improve the energy efficiency of buildings by introducing mandatory participation in energy performance programmes for existing commercial and public buildings. What are your views on this?

We agree that establishing energy performance programmes for existing buildings is an important piece of work. Focusing the majority of government attention, policy and investment on new builds will cement and increase inequality of outcomes across society. This will have a disproportionate impact on Māori, Pacific, low income and young people in general. This is unacceptable.

Government is able to lead in this space. It has the resources and big picture view required to benchmark, establish standards, set expectations, create timeframes for new rules and targets to come on stream. This work is already underway and we support the intention for government to lead the way and take a staged approach to:

- Embodied carbon - reporting, setting a mandatory cap, tightening this up over time, working with the sector, sharing data and insights, government leading in establishing methods and processes and piloting projects.
- Operational efficiency - operational emissions and water caps, tightening over time, Indoor environmental quality parameters, clear guidance and signaling to industry, leadership by public sector and councils adopting the framework.

Establishing a baseline and working to improve operational efficiency over time supports owners and occupants. Owners have a clear picture of what they need to do to improve the performance

of their buildings. They can plan and budget for work over time to meet standards as they come on stream. A clear description of the current state of the building in relation to key objectives: operational efficiency, embodied emissions and occupant health and wellbeing would enable better decision making at the individual and aggregate levels.

Occupants need access to an objective assessment of the likely costs and benefits of choosing to rent, lease and occupy a particular space to base their decision making on. This information is not available as a matter of course. Making information available about direct and indirect emissions, (eg through a Warrant of Fitness for housing) would enable people buying or becoming tenants to make decisions that are a good fit with their:

- Budget - understand the likely cost of heating, cooling, managing humidity. High operational efficiency will reduce low cost for utilities - electricity, water.
- Values - Desire not to contribute to climate change. Choose not to buy, live or work in a place that requires the use of or uses fossil fuels for cooking, heating and cooling. Choose to occupy spaces with generation and storage capability, low operational emissions, low embodied carbon, scale proportional to need etc.
- Health and wellbeing - operational efficiency has a major impact, critical that this is transparent and baselines for minimum standards are established and enforced.

The definition of commercial should include rental accommodation - upgrading the existing housing stock will have a substantial impact on energy efficiency and indoor environmental quality which affects occupant health and wellbeing. We agree that it is reasonable to expect that occupants should have a warm, dry, safe and durable place to live. Given the current housing shortage many households are not in a position to 'choose' these options. A substantial proportion of government investment should be dedicated to improving the operational efficiency and health and wellbeing related standards for rental housing across the board.

A basic level of indoor environmental quality should be the right of all, not just those who can afford to build or buy a new home. Indoor Environmental Quality should be regulated for all housing stock as well as commercial and public buildings. We note the potential for perverse outcomes around the relationship between operational efficiency and indoor environmental quality for occupants. We support clearly defining thermal performance and services efficiency in relation to IEQ parameters.

71. What could the Government do to help the building and construction sector reduce emissions from other sectors, such as energy, industry, transport and waste?

72. The Building for Climate Change programme proposes capping the total emissions from buildings. The caps are anticipated to reduce demand for fossil fuels over time, while allowing flexibility and time for the possibility of low-emissions alternatives. Subsequently, the Commission recommended the Government set a date to end the expansion of fossil gas

pipeline infrastructure (recommendation 20.8a). What are your views on setting a date to end new fossil gas connections in all buildings (for example, by 2025) and for eliminating fossil gas in all buildings (for example, by 2050)? How could Government best support people, communities and businesses to reduce demand for fossil fuels in buildings?

We support the idea of capping total emission from buildings. We support ending Aotearoa's contribution to climate change by decarbonising all systems. We support ending the use of fossil gas and therefore ending fossil gas connections to new buildings as soon as possible to avoid locking in fossil fuel use. We support eliminating fossil gas in all buildings as soon as practicable.

Government needs to clearly signal the direction of travel, changes coming and the timeframes so people, communities and businesses are able to make good decisions in advance of changes being implemented.

Government needs to support people, communities and businesses to invest in and use decentralised renewable electricity production and storage. This will put alternatives in place and enable decommissioning of fossil fuel dependent systems. We note that peak demand and peak production do not necessarily coincide in any single building with renewables production capability. We support the idea of community scale renewables generation which can share capacity across multiple users drawing power at different times of day.

Government should also directly invest in decentralised energy production in areas where this will support communities.

73. The Government is developing options for reducing fossil fuel use in industry, as outlined in the Energy and industry section. What are your views on the best way to address the use of fossil fuels (for example, coal, fossil gas and LPG) in boilers used for space and water heating in commercial buildings?

74. Do you believe that the Government's policies and proposed actions to reduce building-related emissions will adversely affect any particular people or groups? If so, what actions or policies could help reduce any adverse impacts?

Focus on reducing operational and embodied emissions in new buildings will be problematic if it is not accompanied by investment in upgrading existing housing stock and commercial buildings. Investing in new buildings alone will increase inequality and health and wellbeing outcomes. Government support for new builds prioritises the interests of those able to afford to build new over maintenance and upgrade work.

Both need to have focused policy instruments and resources applied. Otherwise the gap between state of the art buildings and the ordinary buildings that most people continue to live and work in will widen. Average efficiency may increase but median efficiency will not. Those living and working in old buildings that have not been upgraded will pay a disproportionate share of the extra

cost of increasing energy payments, higher prices for fossil fuels (old technology for gas cooking and heating) as carbon prices are used to disincentivise emissions generation.

Fairness and equity needs to be built into the transition plan.

75. How could the Government ensure the needs and aspirations of Māori and iwi are effectively recognised, understood and considered within the Building for Climate Change programme?

We support giving authentic expression to the Te Tiriti relationship. We support Iwi and Māori aspirations for wellbeing, prosperity, and a healthy natural environment and tino rangatiratanga.

Māori rights and interests need to be considered at all levels this includes:

- How to give authentic expression to the formal Te Tiriti partnership relationship
- How to give effect to the principles of the Te Tiriti through the BFCC programme
- Te Ao Māori and mātauranga - incorporation of māori values and principles into the BFCC programme
- Opportunities - enterprise opportunities for māori collectives and SME - projects
- Resourcing and capacity building on both sides.
    - Recognise that engagement and consultation can create a burden that may or may respond to Māori concerns or create better outcomes. Demands need to be managed thoughtfully,
    - Support for the BFCC team to work effectively - culturally safe, respectful environment
- Recognising significant injustices have occurred and continue to occur in regards to Construction and Demolition:
    - For many, many decades, and right from the earliest days of European settlement in Aotearoa, native trees were felled for use in construction, without recognition or respect for the value that the trees and forests that they came from held for Māori. The impacts of clear-felling and the widespread destruction of ecosystems are still very visible today. Now, native timber is effectively a finite material. Trees may be selectively felled, however this is rare, and native trees are not considered sustainable for forestry farming. At the same time, buildings containing native timbers are being demolished every day and while there is a market for long lengths of these materials, short timber is usually discarded to landfill, sent for bio-fuel processing or for use as firewood.
    - Another illustration is the issue of landfills. Historically, Māori land was been taken under the Public Works Act for landfills, which are now full of decades worth of C&D waste, and new landfills continue to be created over the objections of Mana Whenua (e.g. the new landfill that has recently been given conditional approval for resource consent in Dome Valley - in this case, some of what will be taken here will be Auckland's C&D waste - see this article for more information).

76. Do you support the proposed behaviour change activity focusing on two key groups: consumers and industry (including building product producers and building sector tradespeople)? What should the Government take into account when seeking to raise awareness of low-emissions buildings in these groups?

Both operational efficiency and embodied carbon need to be mainstreamed as key concepts in building and construction.

Broad public education is required about the role of both dimensions in supporting the shift to zero carbon by 2050. This needs to look at both the hard asset of the building and the soft aspects relating to how it is used.

The idea that we can create zero or carbon negative buildings that act as carbon sinks needs to be promoted and popularised.

The UK's Construction Sector Deal provides an example of an ambitious partnership between the industry and the government that aims to transform the sector's productivity through innovative technologies and a more highly skilled workforce. The Sector Deal builds on Construction 2025 published by the government and the Construction Leadership Council (CLC) in 2013, and provides the framework for a sector that delivers:

- a 33% reduction in the cost of construction and the whole life cost of assets
- a 50% reduction in the time taken from inception to completion of new build
- a 50% reduction in greenhouse gas emissions in the built environment –supporting the Industrial Strategy's Clean Growth Grand Challenge
- a 50% reduction in the trade gap between total exports and total imports of construction products and materials

These goals will be met by focusing on three areas: digital techniques, offsite manufacturing and whole life asset performance. The government and the sector are investing in the Industrial Strategy Challenge Fund (ISCF) Transforming Construction programme, as well as supporting training and infrastructure projects.

77. Are there any key areas in the building and construction sector where you think that a contestable fund could help drive low-emissions innovation and encourage, or amplify, emissions reduction opportunities? Examples could include building design, product innovation, building methodologies or other?

We would prefer to see a collaborative fund. Key area we see needs work is supporting innovation between different parts of the supply and recovery chain.

Enable sharing - Open source anything that is learned and developed share across the system.

Developing tools and processes - Best practice and good practice guides

78. The Ministry of Business, Innovation and Employment (MBIE) is considering a range of initiatives and incentives to reduce construction waste and increase reuse, repurposing and recycling of materials. Are there any options not specified in this document that you believe should be considered?

Waste Hierarchy is a tool for prioritising action

It is important that this work is guided by the waste hierarchy, which is a framework for prioritising action to reduce waste. It prioritises prevention, reduction and reuse over recycling with safe waste disposal options a last resort. It applies to both organic and inorganic materials. It can be used as a 'climate lens' to help guide decisions and investment.

We support the Building For Climate Change programmes initial work on Transforming Operational Efficiency[71] and Whole of life Embodied Carbon Reduction[72]. We welcome the extension of thinking from energy efficiency to whole of life carbon reduction. The use of a consumption emissions framework alongside the production-based emissions accounting enables a much deeper approach to long term emissions reduction.

We support the intention to implement a new decision making framework which factors in embodied carbon emissions from buildings over their life cycle:

- Maximise new build efficiency (Obj 1) which includes taking into account making the size and quantity proportional to need, longevity of buildings and components and exploring upgrades and refurbishment as an alternative to replacement, design in flexibility and resilience.
- Increase material efficiency (Obj 2) - using less materials in new buildings, appropriate performance standards, design stage specification to minimise waste through construction phase, use of long lasting products and materials.
- Decrease carbon intensity through design choices (Obj 3) - low carbon alternatives, visibility of embodied carbon to support decision making, local sourcing of materials.

Extraction phase is missing from the framework

We appreciate the work that has gone into detailing the stages in the whole of life. The relative importance of operational carbon and embodied carbon across the lifecycle is a very useful way of framing the flows of carbon in relation to the lifecycle. However it is not clear if the carbon impacts

[71] https://www.mbie.govt.nz/dmsdocument/11793-transforming-operational-efficiency

[72] https://www.mbie.govt.nz/dmsdocument/11794-whole-of-life-embodied-carbon-emissions-reduction-framework

of the extraction phase are being included in the calculations. The extraction phase can have significant impacts: ecosystem destruction, biodiversity loss and soil loss as well as creating pollution. All of these activities create emissions consequences by reducing the ability of our environment to absorb and retain atmospheric carbon. We think these impacts should be included in the whole of life embodied carbon calculations under A1 if they are not already. It is not clear to us how the benefits and loads stage - D - Reuse, Recovery and Recycling fits into the calculations.

Key principles

Zero Waste Scotland summarises the key principles to reducing construction waste[73]:
"Circular construction starts with designing out waste so that:

- *materials specified and used (natural or technical) can have a future purpose beyond the life of the building;*
- *buildings can be easily adapted for different future uses without generating waste;*
- *building can be easily maintained and repaired without generating waste;*
- *buildings can be easily deconstructed so materials can be reused."*

They describe tools and techniques which can be used at the design stage to reduce construction waste which include: Building Information Modelling, whole of life costing, exploring alternatives to owning materials - sharing, leasing, hiring, servicing and repair to extend life, remanufacture and reuse of buildings themselves as well as materials and components, recycling is a last resort used to displace the need to new raw materials.

Learn from the experience of others

Other countries have been working on reducing emissions from building and construction.

1. *Amsterdam - Circular City Approach*

Amsterdam is taking a comprehensive approach to reducing emissions from the built environment. They are using circular economy and waste hierarchy principles and doughnut economy indicators to reduce the city's carbon and material use footprint. A similar approach could be used to develop a Circular Aotearoa framework.

Amsterdam has set the goal of halving the use of primary raw materials by 2030. Built environment is one of three key focus areas for making progress towards this. Amsterdams circular strategy[74] uses a value chain approach to focus on the whole of life material and emissions impacts of the built environment.

They have developed a 'monitor' based on the doughnut economy model (which establishes ecological and social boundaries). The Amsterdam Circular Monitor outlines how the city will

[73] https://www.zerowastescotland.org.uk/content/reducing-construction-waste
[74] Retrieved from https://www.amsterdam.nl/en/policy/sustainability/circular-economy/ Three useful documents - Amsterdam Circular Strategy - Direction and focus. Amsterdam Circular Monitor - measurement and insight generation. Amsterdam Doughnut - Boundaries and limits - key indicators.

measure progress and gain insights while on the journey. They are using material flow analysis to make an assessment of the circularity of the economy[75].

2. *United Kingdom has developed clear quality standards*

In the UK, the Aggregates Levy, in combination with the Landfill Tax, has been used to shift the business case in favour of recycled and secondary aggregates. It is a tax on sand, gravel and rock that's either been dug from the ground; dredged from the sea in UK water or imported. Reuse of secondary and recycled aggregates is now commonplace.[76],[77]

Consideration of materials and waste is integrated into the resource consent process for large projects in the UK. Materials and Waste is now part of the Environmental Impact Assessment process. Guidance from IEMA (Institute for Environmental Management and Assessment) was published in 2020: IEMA - IEMA Launches Guide to Materials and Waste in Environmental Impact Assessment

Barriers to progress

To enable the widespread use of recycled and reused materials over virgin materials we need to :

- Change the economics - Landfill is a cheap option for C&D waste. C&D landfills need tighter regulation.
- Create standards and specifications to give industry the confidence to use secondary and recycled materials.
- Coordinate the development of a Nationwide Resource Recovery Network including local and regional handling and processing infrastructure eg. next generation resource recovery centres that can consolidate, sort and prepare materials for reuse.
- Enabling policies should include[78]:
    - changes to the Building Code
    - revision of specifications and mandated standards for all government procurement.

Procurement and design are the points in the construction cycle where there is the most potential to have a positive influence on waste diversion outcomes.

Procurement professionals can play a key role in helping to maximise waste reduction and recovery in construction. In Scotland, Zero Waste Scotland has guidance for procuring resource efficient construction projects and is written to assist with all phases of a build from initial design to construction through to renovation and demolition: Procuring resource efficient construction projects | Zero Waste Scotland

[75] P 15-16 and P40-45 of Monitor document for preliminary work on material flows - built environment

[76] See WRAP (2013) Aggregates from inert waste: End of waste criteria for the production of aggregates from inert waste

[77] In the UK AggRegain, was a one-stop source of practical information designed to assist specifiers, purchasers and suppliers of recycled or secondary aggregates. Funded through the Aggregates Levy Sustainability Fund, it built on the work of the earlier Aggregates Information Service to provide a new, free information service - website.

[78] Green Building Council, MBIE, BRANZ and Environmental Choice have all established appropriate tools and standards in this space.

79. What should the Government take into account in exploring how to encourage low-emissions buildings and retrofits (including reducing embodied emissions), such as through financial and other incentives?

N/A

80. What should the Government take into account in seeking to coordinate and support workforce transformation, to ensure the sector has the right workforce at the right time?

N/A

81. Our future vision for Aotearoa includes a place where all New Zealanders have a warm, dry, safe and durable home to live in. How can we ensure that all New Zealanders benefit from improved thermal performance standards for our buildings?

N/A

82. Are there any other views you wish to share on the role of the building and construction sector in the first emissions reduction plan?

Rethinking C&D waste has huge potential to unlock a low-carbon economy. We can make a just transition from a throwaway culture to a zero waste, zero carbon circular economy by transforming our relationship with waste. The good news is that when we reduce waste, we reduce emissions. The evidence shows that we can dramatically reduce our emissions by using resources more efficiently.

Construction is an area of great potential for further emissions reductions.

Currently, the pathway for buildings does not consider the significant carbon emissions associated with new builds. Embodied carbon is responsible for 50% of buildings' carbon emissions. Furthermore, the construction and demolition sector contributes approximately 50% of NZ's waste to landfill. Key transitions for waste and emissions reduction must include this stream and take a whole lifecycle/circular economy perspective for all building and infrastructure projects.

Buildings must be built to be net carbon zero as a minimum standard based on whole-of-life carbon assessment. Globally, this transition is occurring and research is showing that carbon negative construction is feasible with the right material choices. Designing out waste and design for deconstruction are two circular economy principles that must be observed for a building to be net carbon zero. Integrating these principles at the procurement and design phase supports waste reduction and maximises end-of-life recovery of materials.

This is the key area. We need to put urgent attention into the buildings that are being designed now. Buildings should be carbon sinks. We need to consider where we are building, particularly in light of rising sea levels and how we manage the buildings that become inundated and ruined through flooding and sea level rise. We need emergency planning for building waste.

We acknowledge and support the attention being paid to consumption emissions and embodied carbon through the BFCC programme. The changing balance of embodied carbon and operating carbon over time makes it clear that emissions reductions from energy efficiency will only get us part of the way.

We support the general principles in the document - these align well with Circular Economy and Zero Waste principles.

On Heating, ventilation and air conditioning systems

Passive heating and cooling systems should be prioritised. This is important given climate change and the warming of the planet over time.

Design and construction should minimise the need for heating and cooling equipment containing HFC and CFC with high global warming potential. Most small household units contain 1kg + of refrigerant gas. Shifting to low GWP HFO and HCFO gases will minimise the risk of emissions from escape of gas to the atmosphere which is still common.

Agriculture

88. Are there any other views you wish to share in relation to agriculture?

Transforming the agriculture sector presents one of the largest opportunities to reduce emissions and improve a much wider range of environmental indicators. Other submissions will likely cover a range of issues such as reductions in stock numbers and synthetic fertilisers, land-use changes and more. We support transformation in these areas and will leave the science, economics and details on how these could work in practical terms - and how to ensure the agriculture sector becomes Tiriti-compliant - to experts.

The biggest opportunity we see for the agriculture sector from a waste perspective is integrating organic waste management within the frameworks of the circular economy and bioeconomy to direct the development of organic waste collection and processing infrastructure towards the primary purpose of providing agricultural inputs, whether stock feed, fertiliser/compost, soil amendments/mulches or otherwise.

The benefits would be manifold, and would include:

- offsetting and potentially replacing synthetic fertilisers (more on this below) and imported stock feed, and thus their significant environmental impacts;

- providing new employment and sectoral development opportunities in organic waste processing and collection infrastructure, including on-farm systems;
- creation and use of compost to prevent soil degradation and erosion, and to improve the structure, water retention capacity, biodiversity and carbon sequestration potential of soil (see questions 4 & 32); and
- growing community food resilience and connectedness through urban farming and community gardening.

The Climate Change Commission has recently come under fire for failing to include recommendations from an internal report that demonstrated strong evidence for the large emissions reduction potential of eliminating synthetic nitrogen fertiliser use.[79] While we are not well-placed to comment on the science nor the reasons for its omission, in general we support the opportunities of alternative farming methods that would support the transition away from synthetic nitrogen fertiliser, such as regenerative farming. Compost production from organic waste could play a key role in this transition for the agricultural sector.

The economic opportunities for innovation in the agricultural space alone make a strong case for change. Many parts of Europe are harnessing new farming opportunities in the bioeconomy that utilise organic waste. For example, new plant proteins and even insect farming that uses organic waste as a substrate (and which can still be composted after use) are seen as sustainable local protein feed and food production opportunities.[80] At home in Aotearoa, the fast growing regenerative urban horticulture sector combines local-scale food scraps collections and composting with innovative, highly productive and profitable food production business models - OMG's 300m2 urban farm in central Auckland is already turning over approximately $2m per hectare p/a, far more than the average dairy farm.

The good news is that there are international examples where organic waste management is integrated with agriculture, and it would not take much to shift our organic waste policy in this direction. An example is Austria, where a decentralised network of several hundred largely medium-scale (2-3kt p/a on average) on-farm composting facilities has been supported and developed by a sophisticated and collaborative programme between government, the agriculture and waste sectors.[81] This system provides numerous jobs in regional and rural areas, reduces transport emissions compared to centralised composting and anaerobic digestion facilities, and closes the nutrient loop by enabling organic waste to be processed and used close to its production source (including in urban and farm composting sites). We recommend the government investigates the opportunity to develop a similar system in Aotearoa.

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[79] See https://www.greenpeace.org/aotearoa/press-release/climate-commission-ignored-climate-benefits-of-cutting-synthetic-nitrogen/; https://www.1news.co.nz/2021/09/22/allegation-climate-commission-ignored-own-advice-on-cutting-synthetic-nitrogen/. Report available here: https://www.greenpeace.org/static/planet4-aotearoa-stateless/2021/09/84efbe8e-removing_synthetic_n_writeup.pdf

[80] See e.g https://www.zerowastescotland.org.uk/content/future-food-lessons-latest-protein-strategies

[81] Liam Prince (July 2021). *Expanding organic waste collections and composting in Aotearoa.* Commissioned by Greenpeace Aotearoa: https://www.greenpeace.org/static/planet4-aotearoa-stateless/2021/09/0e47a063-expanding-organic-waste-collections-and-composting-in-aotearoa.pdf

Waste

89. The Commission's recommended emissions reduction target for the waste sector significantly increased in its final advice. Do you support the target to reduce waste biogenic methane emissions by 40 per cent by 2035?

Yes we support the target to reduce biogenic methane emissions by *at least* 40% by 2035.

The practice of sending organic waste to landfill is completely unsustainable and we have to stop doing this, urgently. Organics in landfill represent not only a source of methane, but a loss of valuable nutrients and resources, and inefficiencies in systems of production and consumption. A meaningful reduction of organics to landfill requires a multi-faceted approach of source reduction, material separation, and phasing-out composite products that contain an organic component but cannot be adequately recycled or composted. An ambitious emissions reduction target for the waste sector is one powerful lever for driving these activities.

We recommended a more ambitious waste emissions target in our submission on the CCC's draft advice, and also note that the CCC suggested that this target should be at least 40%, suggesting reductions could be even higher. We continue to advocate for a more ambitious emissions reduction target and would like to see the government adopt 40% as a minimum (it could be a range like the other targets in the Aotearoa Waste Strategy, e.g. 40-50%).

We also want to see targets for organic waste (alongside those in the proposed Waste Strategy) that go beyond methane emissions reductions; in particular:

- a 60% reduction in organic waste disposal by 2030
- a separate organics collection target of 65% by 2030 and
- a food waste prevention target, e.g. halving food waste at source by 2030 to align with the UN SDG 12.3.

These targets give a greater degree of practical specificity for the waste sector that will help us in the goal of realising the methane emissions reduction target for organic waste. We're not recommending these targets as an 'instead of', but as a vital supplement to ensure we succeed in this vital emissions reduction task.

We also support setting a target to reduce emissions from waste generally (not just biogenic methane emissions from landfill). In other words, we would like to see targets to reduce the emissions generated by the production and consumption of materials that become waste. This would require accounting for consumption-based emissions, and is best addressed in the proposals to transition Aotearoa to a circular economy. A material flows analysis would be a first step priority action in order to progress this work - see questions 45 and 48.

Taking a broader view of the emissions impact of waste minimisation/zero waste work helps to complete the picture of the full potential role that moving towards a circular economy can play in combating climate change. As the Circularity Gap 2021 Report makes clear, we need to reduce raw material consumption in order to stay within 1.5 degrees of global warming. We can do this through zero waste strategies that keep products and materials in circulation for as long as possible and trigger product and business model redesign to reduce upstream production.[82]

These activities need to happen alongside (not instead of) ambitious and deep cuts to biogenic methane emissions of organic waste from landfill. It's important to note that there will be many instances where more circular business practices based on reduction and reuse will cut greenhouse gas emissions from production, but also biogenic methane from landfill, e.g. reusable packaging systems that eliminate composite/fibre-based packaging.

Need to revise emission factors for organic waste treatment

We note that the modelling for biogenic methane waste emissions reductions on page 108 makes certain assumptions and is based on emission factors from the NZ GHG Inventory. This section makes the case for reconsidering the assumed 40%/60% split between composting and anaerobic digestion (AD) for food waste in the modelling for the sake of accurate emissions accounting - primarily so that AD is not unjustifiably biased over composting. Various data and studies on organic waste treatment emissions indicate that NZ's emission factors are too high for composting and too low for AD.

Make no mistake - we wholeheartedly support the approach to focus on diverting organic waste from landfill not only for the emissions reductions it will achieve, but even more importantly to regenerate natural systems, restore biodiversity, and recover and recycle nutrients and carbon for use in a circular bioeconomy. We have not explored landfill emission factors in depth because landfilling organics is an entirely unacceptable and unsustainable source of emissions[83] and loss of nutrients and resources that must stop.

The discussion must instead be focused on the relative benefits of organic waste treatment options for both emissions reductions and wider environmental outcomes. For example, while AD is a good processing option for liquid organic wastes that are difficult to compost and would help offset synthetic fertiliser and fossil gas, the benefits of applying compost to soil are much

[82] https://www.circularity-gap.world/2021

[83] As one example, the U.S. EPA's Waste Reduction Model (WARM) shows that landfilling has a far higher emission factor compared to every other option, even when accounting for LFG capture and associated energy offsets: U.S. Environmental Protection Agency Office of Resource Conservation and Recovery (February 2016). *Documentation for Greenhouse Gas Emission and Energy Factors Used in the Waste Reduction Model (WARM): Organic Materials Chapters.* Page 1-7. https://www.epa.gov/warm/documentation-chapters-greenhouse-gas-emission-energy-and-economic-factors-used-waste-reduction

preferable to digestate from the perspective of restoring and building healthy soil systems,[84] the importance of which we have discussed elsewhere (question 4).

Process emissions

Updating the NZ GHG Inventory emission factors for AD and composting is needed to improve modelling accuracy to ensure the >40% emissions reduction target can be achieved. The emission factors for composting and AD are based on the IPCC guidelines' Tier 1 data (i.e. default, rather than country-specific, data), which are not up-to-date with the latest science.[85] While the IPCC guidelines state that "The default data should be used only when country-specific data are not available",[86] we understand such NZ-specific data are not readily available, nor do we have operational large-scale AD facilities here yet - hence the default values are used.

The consultation's proposed priority action to fast track a data and licensing system (page 109) should eventually help us develop locally-relevant emission factors, and provide a benchmark to set goals for improvement and monitor progress, helping to establish best practice for organics processing in Aotearoa.

In the meantime, the default emission factors used in the GHG Inventory need to be reassessed in light of international evidence. Several countries have moved away from using these default IPCC emission factors, instead drawing on more comprehensive and specific science and research, including:

- The Netherlands: Use emission factors based on data from an independent review of various emission factors from multiple sources and studies (DHV, 2010), which recommended the following emission factors:
    - Composting: 710g CH4 per tonne and 68g N2O/t of organic waste
    - AD: 3700g CH4/t and 120g N2O/t.[87]
- Germany: Use emission factors based on data from Cuhls et al. (2015), in which emissions measurements, covering methane, nitrous oxide and ammonia, were carried out at 19 composting and 16 digestion facilities in Germany. The emissions factors obtained for composting were:

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[84] Jane Gilbert, Marco Ricci-Jürgensen and Aditi Ramola (2020). *Benefits of Compost and Anaerobic Digestate When Applied to Soil*. International Solid Waste Association, Working Group on Biological Treatment of Waste Report 2. https://www.iswa.org/biological-treatment-of-waste/?v=8e3eb2c69a18

[85] See DHV (July 2010). *Update of emission factors for N2O and CH4 for composting, anaerobic digestion and waste incineration*. Study for Government of the Netherlands: http://www.emissieregistratie.nl/erpubliek/documenten/Lucht%20(Air)/Industrie%20en%20Energieopwekking%20(Industry%20and%20Energy)/Afval/DHV2010%20-%20Update%20emission%20factors%20N2O%20and%20CH4%20for%20Waste.pdf; and Denis Dionne (Nov 2013). 'Composting operations: which emission factors should be used?' *Enviro-access GHG Experts*. https://www.enviroaccess.ca/blog-en/2013/11/29/composting-operations-emission-factors-used/

[86] Riitta Pipatti (2006). 'Chapter 4: Biological Treatment of Solid Waste.' *2006 IPCC Guidelines for National Greenhouse Gas Inventories*, Volume 5: Waste. https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol5.html, p. 4.5

[87] Netherlands 2020 National Inventory Report: https://unfccc.int/documents/226476 p. 242; also see DHV study, footnote 12.

- Composting: 1,400g CH4/t and 74g N2O/t of organic waste
- AD: 2,800kg CH4/kt and 67kg N2O/kt.[88]

These factors are substantially different to the IPCC default values used in NZ's GHG Inventory, which are (converted to similar denominations for ease of comparison):

- Composting: 4000g CH4/t and 500g N2O/t of organic waste
- AD: 800g CH4/t and N2O emissions assumed negligible

Converting and rounding the figures above so to be comparable with the emission factors in the NZ GHG Inventory, the **combined emission factors on kg CO2e/ kg waste** is as follows:

	Composting	**AD**
IPCC Values (used in NZ GHG Inventory)	0.172	0.020
Netherlands (based on DHV 2010)	0.047	0.13
Germany (based on Cuhls et al. 2015)	0.057	0.09

What do all the numbers mean?

The European emission factors show two things when compared to the IPCC values:

- **Composting has a more favourable emissions profile than AD**. The Dutch and German figures show that for every kg of organic materials processed, composting emits between 47-57g of CO2e as methane and nitrous oxide, while AD emits more than double - between 90-130g
- **Combining both AD and composting factors adds up to a smaller emissions profile overall**.

This means that a greater emphasis on composting as the lower emitting technology would reduce the contribution of organic waste treatment to the emissions profile of organic waste overall. We recommend the government explore applying these alternative emission factors to model a range of infrastructural settings, including the 40% composting / 60% AD as per ERP (e.g. 60/40% and 80/20%).

Broadening emission factors to include lifecycle emissions and offsets

While it is important to bring the emission factors currently used up-to-date with current science, they also only form one small part of the overall climate implications of organic waste. We would like to see a wider set of new NZ-specific emission factors based on lifecycle GHG impacts (not just

[88] Germany 2021 National Inventory Report: https://unfccc.int/documents/273433 pp. 713-718

disposal and treatment) developed, which should include source reduction, offsets and sequestrations from process outputs (biogas, digestate and compost) transport and operational emissions (e.g. power/machinery needed for the process).

The emissions impact of the infrastructure build itself should also be accounted for - the emissions embodied in the materials and from the construction process. The physical and operational equipment needed for infrastructure should also be aligned with a circular economy.

The narrow focus on emissions from treatment and disposal may be a symptom of the production-based emissions accounting approach that predominates in New Zealand's climate policy. In our view, production-based accounting is overly narrow, not only in that it discounts whole-of-life consumption-based emissions embodied in inorganic/technical materials (which is relevant when considering the embodied emissions in materials and construction for infrastructure), but it risks overly limiting organic waste policy conversations to the bottom of the waste hierarchy, rather than an accounting approach that is more compatible with the circular economy.

Despite its shortcomings, the U.S. EPA's Waste Reduction Model (WARM) could be drawn on as a way to incorporate lifecycle GHG data to form a comprehensive framework of organic waste emission factors. These factors look beyond only treatment and disposal emissions and also account for transport emissions, energy recovery and fertiliser offsets, output (compost or digestate) application to land emissions and sequestrations, and more.[89]

For food waste, the WARM has a net composting emission factor at -0.12 Mt CO2e and net anaerobic digestion emissions of -0.04 Mt CO2e per short ton, showing that composting has a three-fold better carbon footprint in their lifecycle assessment. It is important to note that the largest determining factor in this difference is soil carbon sequestration which would require updating the scope of the NZ GHG Inventory.

It is important to recognise the shortcomings stemming from the WARM's narrow focus on emissions and carbon. The fact that the WARM model shows 'combustion' of organic waste in waste-to-energy facilities as marginally more favourable than composting (-0.13MtCO2e vs -0.12 respectively) demonstrates the genuine danger of a production-based emissions focus; combustion destroys the value of organics as a bioeconomic resource for agriculture and soil restoration, and could also sacrifice the large consumption-based and lifecycle emissions reductions possible for a vastly smaller end-of-life emissions reduction.

Indeed the WARM model only accounts for 'end-of-life' emissions for combustion (transporting waste to facility, energy utility offset, fugitive emissions). Compare this to the emissions that are

[89] U.S. Environmental Protection Agency Office of Resource Conservation and Recovery (February 2016). *Documentation for Greenhouse Gas Emission and Energy Factors Used in the Waste Reduction Model (WARM): Organic Materials Chapters.* https://www.epa.gov/warm/documentation-chapters-greenhouse-gas-emission-energy-and-economic-factors-used-waste-reduction

avoided with source reduction: on average -3.66MtCO2e, a full 28x more than combustion which is the next best option.[90]

A set of emission factors that account for lifecycle emissions similar to the WARM would provide no doubt as to the need for Aotearoa to take a waste hierarchy approach to emissions reductions. Despite the substantial change in accounting framework this would entail, it could have considerable implications on the shape of organic waste policy: it would ensure actions and investments at the top of the hierarchy are prioritised and account for associated emissions (e.g. transport) and product end-use indicators (e.g. application to soil, different uses in the bioeconomy).

The relevance of the discussion we have presented here regarding emission factors relates to the best use of diverted organic waste, i.e. the right balance of organic waste processing approaches. Furthermore, this work should not delay efforts to divert organic waste from landfill now, including implementing the preparatory policy settings to mandate source separation, and to signal a ban on organics to landfill.

90. Do you support more funding for education and behaviour change initiatives to help households, communities and businesses reduce their organic waste (for example, food, cardboard, timber)?

Yes, and there are substantial benefits if a holistic approach is taken (see question to Q44).

However, education and behaviour change must be backed up by investment and regulation at the top of the waste hierarchy and supply chain. We need to incentivise producers of food and organic waste to adopt and change practices that prevent waste at source - reducing food waste at the retail and consumer level is a step down both the hierarchy and supply chain. We also need incentives and investment for new business models, such as regenerative urban horticulture, that localise food supply chains, helping to reduce waste and emissions across the food supply chain by cutting out excess packaging, transport and distribution logistics.

The discussion of options to reduce food and organic waste at source are underexplored and lacking detail in this proposal, which is inconsistent with prioritising the top of the waste hierarchy. We assume that this is partially a result of a disproportionate emphasis on production-based emissions (i.e. biogenic methane from landfills), rather than giving appropriate weight to consumption-based emissions that occur across supply chains. An updated set of emission factors that includes source reduction could help alleviate this oversight (e.g. U.S. EPA's WARM model, see question 89).

This omission is clearly demonstrated by the issue of food loss and waste. It's estimated a third of all food produced is lost or wasted across the supply chain, accounting for as much as 8% of global

[90] See pages 1-6, 1-7 and 1-30 in the WARM Organic Materials Chapters.

emissions.[91] Project Drawdown has identified food waste reduction as one of the most significant opportunities for emissions reductions globally.[92] A focus on consumption-based emissions and the top of the waste hierarchy are needed to properly address the environmental impacts of food waste.

There are significant opportunities to reduce these impacts all across the food system in Aotearoa. Locally, NZ Food Waste Champions of 12.3 and Otago University's *Food Waste Reduction Roadmap* identifies a range of concrete changes that could be made now.[93] Globally, the Ellen MacArthur Foundation has detailed the climate and biodiversity benefits and opportunities of transforming food systems in *The big food redesign*.[94] Both reports could help inform a cross-government workstream that incorporates the circular economy and bioeconomy strategy with existing programmes like MPI's *Fit for a Better World* to help transform how we produce, consume and dispose of food in Aotearoa. Additionally, we support the call in NZ Food Waste Champions of 12.3's submission for a Food Waste Strategy that contains a definition, baseline data and targets for food waste.

Growing the urban farming sector, coupled with localised composting, also has potential to offset a range of inefficiencies in the food system while providing a wide range of benefits to local communities. The high levels of community engagement provided by urban farming (e.g. Kaicycle in Wellington, OMG in Auckland, Cultivate Christchurch) are perfect spaces for coupling waste reduction education and behaviour change programmes with concrete systems and infrastructure to cater for new habits.

91. What other policies would support households, communities and businesses to manage the impacts of higher waste disposal costs?

The best way to reduce disposal costs is to implement zero waste and circular economy strategies across society to drastically reduce the need to dispose of waste in the first place. Ambitious policies will be required and a willingness to adopt regulatory interventions that go across supply chains. See our responses to the circular economy questions above, and our submission on the Waste Strategy and Legislation review.

There will also be a need to prioritise local-scale actions and strategies that grow community resilience and connectedness, provide local employment and economic opportunities, and keep resources and finances flowing internally rather than being extracted by multinational companies - all things that can reduce inequities and the impacts of a new policy environment. These actions

[91] Nadia Sciallaba (2015). *Food wastage footprint & climate change*. FAO, https://www.fao.org/documents/card/en/c/7338e109-45e8-42da-92f3-ceb8d92002b0/

[92] Project Drawdown (2021). 'Table of Solutions.' https://drawdown.org/solutions/table-of-solutions

[93] Tessa Vincent and Trixie Croad (2021). *Food Waste Reduction Roadmap: Mapping out solutions for food waste reduction at each stage of the food supply chain.* NZ Food Waste Champions 12.3 and University of Otago Food Waste Innovation Research Theme: https://www.nzchampions123.org/resources

[94] Ellen MacArthur Foundation (2020). *The big food redesign: Regenerating nature with the circular economy.* https://ellenmacarthurfoundation.org/resources/food-redesign/overview

are much more likely to be compliant with Te Tiriti o Waitangi if they empower and resource hapū and iwi to enact rangatiratanga. See answers to questions 17 & 19.

92. Would you support a proposal to ban the disposal of food, green and paper waste at landfills for all households and businesses by 1 January 2030, if there were alternative ways to recycle this waste instead?

Yes. We would also support a disposal ban on a wider range of organic (containing) materials (such as textiles, nappies, timber, composite packaging containing organic elements (e.g. liquid paperboard), dead animals, sewage sludge and anything else that can be diverted and processed for reuse, recycling or compost) - although some of these materials may be better to phase out from use in the economy entirely. The ban should eventually apply to all producers of organic waste, not just households and businesses, such as institutions and organisations (e.g. schools, universities, hospitals, government agencies).

The government should also ban disposal of food waste via the wastewater system (e.g. Insinkerator for households and larger commercial-scale systems), as has been done in several European countries (e.g. Scotland, Slovenia). The wastewater system is too often simply a long pathway to landfill for organics being disposed of this way, and mixing of wastewater streams makes it difficult and risky to reuse wastewater biosolids due to contamination. The frequent greenwashing combined with the convenience-factor of wastewater disposal systems means they are far too commonly used to dispose of food waste, and many users are unaware of their negative environmental impacts.

A ban on wastewater organics disposal systems will be necessary to achieve targets to reduce landfill emissions and disposal rates, as well as increase separate collection rates, and will help take pressure off some of our country's aging and frail wastewater treatment systems.

The need for a ban does not depend on more data

We note that the consultation document states more data is required first to determine whether or not an organic waste disposal ban is needed. We agree there is a need to improve organic waste data for many reasons and that a licensing system would be a good way to achieve this.

However, we disagree with the premise of waiting for more data, or waiting for alternative ways of recycling waste, before deciding whether to set a ban in motion. One key point of a ban being set at a date in the foreseeable future is to **send a powerful signal of intent** that will incentivise activities that divert and utilise the value of organic materials. While we do need to be mindful of not bringing in a ban too quickly in a way that creates perverse outcomes, the longer we wait to signal this intention, the fewer incentives there are (and thus the slower we are) to start developing the

necessary infrastructure. While it is somewhat a chicken and egg scenario, our recommendation is to set a ban in place as soon as possible, with conditions.

Organics disposal bans and mandatory recycling laws, alongside a variety of other policy measures, have been used frequently in overseas jurisdictions to encourage and incentivise the development of organic waste reduction and diversion infrastructure.[95] A disposal ban can be backed up with a mandatory separate collection requirement (as the EU has done),[96] and there are various ways to design a 'phased' disposal ban to enable the rapid but controlled development of collection and processing infrastructure, such as:

- Distance-to-facility exemptions (e.g. ban or mandate applies only if an organics processing facility is within 100km)
- Waste production thresholds that reduce over time (mandatory separate collection applies to entities that produce >25 tonnes p/a at first, then >10 tonnes p/a and then eventually everyone)
- Material exemptions (as alluded to in the ERP proposals)
- Changes to these exemptions and thresholds can be triggered once certain rates are achieved, or conversely if certain targets are not met.

Carefully crafting a set of conditions will ensure new infrastructure is not overwhelmed by too much feedstock too soon, helping to avoid unintended negative outcomes like illegal dumping or development of sub-optimal residual waste treatment technologies such as MBT.

We thus support enacting an organic waste disposal ban to come into force by 1 January 2030 as soon as possible, but with exemptions and thresholds. See other questions in this section for more detail on supporting policies that will help ensure the disposal ban is effective.

93. Would you support a proposal to ban all organic materials going to landfills that are unsuitable for capturing methane gas?

Yes. Additionally, the ERP acknowledges the risk that "relatively cheap disposal for Class 2–5 landfills undermines reduction and resource recovery alternatives" (p. 103). There are a few ways this could be managed:

- a meaningful increase to the waste disposal levy for Class 2-5 landfills

[95] For a comprehensive analysis of how such laws can be designed and their effectiveness in practice in the USA, see Katie Sandson et al. (July 2019). Bans and Beyond: Designing and Implementing Organic Waste Bans and Mandatory Organics Recycling Laws. Prepared by Food Law and Policy Clinic at Harvard Law School, and Centre for EcoTechnology (CET): https://wastedfood.cetonline.org/wp-content/uploads/2019/07/Harvard-Law-School-FLPC-Center-for-EcoTechnology-CET-Organic-Waste-Bans-Toolkit.pdf

[96] Liam Prince (July 2021). *Expanding organic waste collections and composting in Aotearoa.* Commissioned by Greenpeace Aotearoa. Page 20: https://www.greenpeace.org/static/planet4-aotearoa-stateless/2021/09/0e47a063-expanding-organic-waste-collections-and-composting-in-aotearoa.pdf

- Designing exclusions for organic waste disposal into the licensing regime for operators Class 2-5 landfills, as well as requirements to separate and send materials for reuse/recycling/composting for licensed operators at other parts of the resource recovery system
- bringing forward the enforcement date for a disposal ban on these landfills to align with the date at which LFG capture systems must be installed for class 1 landfills (e.g. by 31 December 2026).

94. Do you support a potential requirement to install landfill gas (LFG) capture systems at landfill sites that are suitable?

Yes, however this must be employed with caution. This requirement must only be enacted in the context of strong diversion requirements. Otherwise, LFG capture may discourage diversion. The priority needs to be on stopping the practice of sending organic waste to landfill. This is not only because this would avoid the methane generation in the first place, but also because organic waste in landfill also represents an enormous loss of nutrients and resources that urgently need to be diverted, processed and returned to Papatūanuku in ways that restore the mauri of soil by enhancing soil biodiversity, structural integrity, carbon sequestration, water retention and long-term health and fertility.

95. Would you support a more standardised approach to collection systems for households and businesses, which prioritises separating recyclables such as fibre (paper and cardboard) and food and garden waste?

We agree that kerbside collection standardisation can help achieve higher resource recovery rates, and we support regulations that mandate the separation of waste streams for collection or recycling at source.

However, to follow best practice, kerbside collections must be seen as one element in an array of options for waste prevention, reduction, reuse and recovery. They cannot be seen as a one-size-fits-all approach, and should be carefully designed so as not to undermine activities that achieve waste diversion alongside multiple beneficial social, cultural, environmental and economic outcomes.

This may include activities such as local-scale and community-based resource recovery centres and decentralised composting networks. Such local systems help keep resources and thus jobs within communities, minimise transport, increase food resilience in connection with urban farming/community gardening, enhance degraded soils and much more.

96. Do you think transfer stations should be required to separate and recycle materials, rather than sending them to landfill?

Yes, and we support this as a measure in addition to source separation requirements, so that transfer stations/resource recovery centres (RRCs)/MRFs don't incentivise the commingling (and thus contamination) of waste streams.

Requiring the separation of materials at transfer stations/RRCs opens up opportunities beyond recycling and further up the waste hierarchy. With clean and separate streams, such centres can create opportunities to reuse, repair, remanufacture and repurpose products and materials. This is already happening to some extent around the country at sites like Xtreme Zero Waste in Raglan, Seagull Centre in Thames, Wanaka Wastebusters, The Second Treasures Shop in Wellington, several of Auckland's CRCs, and many more.

97. Do you think the proposals outlined in this document should also extend to farm dumps?

The organic waste disposal bans should also apply to farm dumps. While it may prove difficult to enforce, it may at least create incentives for developing on-farm composting facilities (see response to question 98).

It would also be good to see the emissions from farm dumps included in a farm's overall emissions profile. We would advocate for the inclusion of farm dump emissions in the pricing mechanism being developed by He Waka Eke Noa.

98. Do you have any alternative ideas on how we can manage emissions from farm dumps, and waste production on farms?

If Aotearoa is to achieve a circular bioeconomy, the agriculture sector (alongside other land-use sectors like forestry) must be integrated into organic waste management policy to develop an on-farm composting industry following Austria's model (see answer to question 88). This means that organic waste collection and processing infrastructure should be co-designed with the agriculture sector to ensure that farms are able to maximise the opportunities to regenerate and restore the mauri of soil, to offset harmful fertiliser use (while also lowering costs), and to generate new agricultural jobs in organic waste management.

An on-farm composting industry could be developed to process organic waste both from urban sources and the farm itself to make high quality compost for use on-farm. Having on-farm composting facilities nearby could help disincentivise farmers from using unmanaged dumps or pits to dispose of organic waste.

There is much scope for innovation and numerous benefits for on-farm composting. For example, the new system of "swale composting" allows for on-site composting on farms in a way that contains leachate and minimises emissions. This low temperature composting system emits less GHG, especially when biochar is incorporated. It also eliminates the double and triple handling of organic waste given the resultant compost is not mixed, turned, or moved off site.

Currently there are composting quantity limits imposed in some regional areas, like Auckland. These could be eliminated or increased for farms that are not selling compost but using it on site for soil improvement. The City to Farm Project is using in-situ composting swales that rapidly break urban food scraps down to produce an enriched mulch for growing bananas. Once the compost material has reached maturity it should not be defined as compost but as soil, or as a soil amendment thus allowing on-going soil improvement on site.

There are a range of additional solutions identified in the Food Waste Reduction Roadmap that can help reduce waste production on farms.[97]

99. What other options could significantly reduce landfill waste emissions across Aotearoa?

We support using the waste hierarchy to maximise and prioritise organics diversion from landfill. We also support using an organics-specific waste hierarchy, such as the food waste hierarchy.[98] As always the higher up the hierarchy you target your action the better the outcome. Using simple zero waste strategies like supply chain management, separation at source, separate collections, composting and reuse would reduce both biogenic methane emissions and consumption based emissions across the lifecycle. For example

- Junk mail can be eliminated to reduce paper flows through kerbside collections
- By products from food processing can become inputs for other food processors to create 'industrial symbiosis'
- Unsold edible food can be passed on to people or become animal feed
- Food and green waste can be collected and processed using simple composting systems at the local and regional scale
- Textiles flows can be slowed down by buying fewer better quality items and wearing them for longer, and they can be sorted and diverted to reuse or reprocessing options
- Building design and construction processes can reduce waste generated
- Construction and demolition materials can be diverted for reuse and remanufacture
- Design for deconstruction makes it safe and easy to dismantle objects into their component parts.

Once diversion is achieved, assessing the appropriate treatment and use of organic materials must account for more than just biogenic methane emissions. UNEP[99] prioritises investing in nature to complement or strengthen its ability to provide services as well as its intrinsic value. Urban and regenerative farming build the capacity of soils to support life, increasing net biodiversity. Returning high quality compost to soil so it can grow more food and sequester carbon is of critical importance.

[97] Tessa Vincent and Trixie Croad (2021). *Food Waste Reduction Roadmap: Mapping out solutions for food waste reduction at each stage of the food supply chain.* NZ Food Waste Champions 12.3 and University of Otago Food Waste Innovation Research Theme: https://www.nzchampions123.org/resources

[98] Brenda Platt (4 April 2017). 'Hierarchy to Reduce Food Waste & Grow Community.' *Institute for Local Self-Reliance*: https://ilsr.org/food-waste-hierarchy/

[99] Principle 4 - UNEP 2021 International good practise principles for sustainable infrastructure Nairobi

For the above reasons, we caution the enthusiasm for AD as a primary form of organic waste treatment. As mentioned in question 89, AD is a viable large-scale processing option for liquid wastes that can help offset the use of natural (fossil) gas, however, its disruption of the carbon cycle (i.e. maximising GHG emissions from organic waste, rather than maximising soil organic carbon) as well as the drawbacks of chemically volatile digestate and derivative fertilisers, should be carefully considered when comparing it to composting.

Some countries (e.g. Italy) treat digestate as a 'waste' that cannot be applied to land without adequate processing or composting due to the volatile effects when it is applied to agricultural soils (NOx emissions, depletion of soil organic carbon and nitrate run-off) which Aotearoa is only too familiar with.

Furthermore, comparisons of the emissions profiles of AD and composting are often oversimplified. Large-scale, mechanically turned aerobic composting (i.e. windrows) produce far more CO2 emissions than inoculated static pile composting methods such as SPICE and using BAM.[100]

Ultimately, the policy drivers for organic waste need to account for a far broader range of impacts and outcomes than the approach taken in this plan. Organic waste policy should be informed by a holistic, cross-sector approach that considers a wide range of social, economic and environmental impacts and outcomes alongside emissions reductions.

We strongly support the third guiding principle (p.20 of the consultation doc), Environmental and social benefits beyond emissions reductions, but this has not been adequately applied to the organic waste proposals. The imperative to reduce emissions cannot be the sole driver of action for organic materials and we recommend that Government policy decisions be guided by a matrix of social, environmental, cultural and economic criteria, with a focus on building localised solutions that grow community economic resilience and enhance wellbeing. The opportunities for community- and iwi/hapū-led enterprise and initiatives, and broader outcomes such as community food resilience and soil regeneration will depend on the priorities driving the development of organic waste collection and processing infrastructure.

To achieve the organic waste targets, we see the need for dedicated organic waste/materials strategies and action plans, including a food waste strategy that provides guidance for all sectors across the food cycle. These strategies should be in line with the waste hierarchy in order to reduce consumption-based emissions from food waste in particular (e.g. food production and distribution emissions). They must be cohesive with te ao Māori and Te Tiriti obligations, and serve

[100] Liam Prince (July 2021). *Expanding organic waste collections and composting in Aotearoa.* Commissioned by Greenpeace Aotearoa. Page 15: https://www.greenpeace.org/static/planet4-aotearoa-stateless/2021/09/0e47a063-expanding-organic-waste-collections-and-composting-in-aotearoa.pdf

to uphold related policy including climate targets and freshwater quality targets, as well as goals for waste reduction, resilience, community health and wellbeing.