Working Paper: Regulating products, production, and consumption for a circular economy in Aotearoa New Zealand

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Overview

The headline goal of the circular economy is to reduce raw material extraction and toxic pollutants in order to preserve a safe planetary operating space for humanity and regenerate nature. This is a transformative vision, requiring a paradigmatic shift away from how we currently make and consume products. Legislative action is needed to align regulatory settings and economic incentives with the transition towards more sustainable business models.

This working paper explores the **legislative tools for product regulation and business model transformation** that could help the New Zealand Government accelerate uptake of circular behaviours at the top of the waste hierarchy (i.e. behaviours that reduce natural resource consumption and pollution, and allocate the resources we do use more efficiently).

In practice, these are powers aimed at drawing down production and consumption, including incentivising business models to shift from individual ownership and disposability, towards sharing/service-based models, product durability, and reuse.

The upcoming update of the Waste Minimisation Act 2008 provides an opportunity to introduce some of these powers in New Zealand. However, these powers remain underexplored in the New Zealand context, inhibiting their adoption. This paper seeks to fill this gap, drawing on **a thematic analysis of 180+ overseas examples of ambitious circular legislative action**, as well as recommendations from secondary literature (listed in the living document that accompanies this paper Legislative Measures and Powers for Circular Products, Production and Consumption, as of January 2023). These actions are categorised into one of seven themes: bans and restrictions; mandates and obligations; targets and target-setting powers; economic instruments (including fiscal instruments); circular design specifications for products and services; resource recovery standards for reuse; and requiring transparency in relation to products and materials. Each thematic grouping receives a focused analysis, including discussion of how the powers could be incorporated into New Zealand law.

NB: This paper focuses on legislative tools for the technical sphere of the circular economy, with an emphasis on reduced consumption and reuse. Recycling, the biological loop, the bioeconomy, and broader questions of policy, investment, and voluntary actions, while also important, are beyond the scope of this research.

1

Introduction

Introduction

Like many Governments around the world, the New Zealand Government has set itself the task of transitioning the country to a circular economy (by 2050), as set out in the first Emissions Reduction Plan (MfE, 2022, p.157) and the proposed New Zealand Waste Strategy update (MfE, 2021). As will be discussed, this is a transformative vision; progressing it will require changes to the law to enable upstream and downstream regulations of products and business models.[1] Research for this working paper has so far uncovered over 180 examples of such provisions being developed or applied overseas (with an initial emphasis on European laws given advances in product policy in that jurisdiction).[2] For New Zealand to adopt similar provisions locally, the update of the Waste Minimisation Act 2008 (WMA) offers a key vehicle. The WMA already includes provisions containing the types of enabling powers that underpin product policy (ss 22 and 23), but these are out of date.

To equip New Zealand governments with the powers needed to advance circular activity at the top of the waste hierarchy (in relation to products and business models), the WMA could be updated to:

[1] For example, in a recent study that modelled policy scenarios for the circular economy, the World Bank (2022, p.18) concluded that without legislative reform to dismantle the linear economy, no amount of promoting circularity will achieve the shifts needed to decouple economic activity from material consumption.

[2] These provisions are compiled in the living document *Legislative Measures and Powers for Circular Products, Production and Consumption* that accompanies this working paper. This spreadsheet continues to be updated and the analysis in this paper is a snapshot in time.

- Broaden the power to ban and restrict specified products, substances and activities.
- Create binding target-setting powers and the ability to mandate certain activities.
- Expand available economic instruments to allow for levies, eco-modulation, targeted subsidies, and fees that can be redirected to finance activities up the waste hierarchy.
- Create powers to set circular design specifications and standards for products and services, e.g. resource efficiency and detoxification requirements.
- Enable the setting of resource recovery standards for reuse.
- Expand existing labelling powers to require greater transparency in relation to products and materials.

The working paper explores each of these powers in more detail, with specific reference to the potential to include them in the WMA update. The paper also discusses circular taxation reforms, as these are highlighted repeatedly in the secondary literature as critical for incentivising the types of circular business models that slow and narrow resource flows. Further research is recommended to explore how New Zealand's hazardous substances regime can be updated and better integrated with circular economy and waste legislation, to support detoxification of product and material loops.

This paper focuses on legislative tools for the technical sphere of the circular economy, with an emphasis on reduced consumption and reuse. As such, many important and relevant topics sit outside the scope of the paper, including recycling, composting, the biological loop, the bioeconomy, and broader supportive measures, like policy, investment and voluntary actions. These topics all warrant focused research. Further research is also needed to determine the compliance, monitoring and enforcement framework that should sit behind the use of any of the legislative tools discussed in this paper, to ensure their efficacy and achievability in practice.

Prior to discussing the potential legislative actions, the following sections of this paper will review:

- why a focus on reducing raw material extraction and pollution sits at the heart of the circular economy;
- the circular business models that are most likely to advance this goal; and
- the reasons legislative action is needed to stimulate businesses to move up the waste hierarchy, or towards the 'inner loops' of the technical sphere, in their business practice.

2

The headline goal of the circular economy

The headline goal of the circular economy

> **"...we live on a planet with finite resources. Yet our consumption of these resources is growing exponentially. Without widespread change that impacts every life, and every part of living it, it will not be OK... We have a choice to make: invest in our planet or forfeit our lives and the lives of generations to come… if we don't all act, we won't get out of this alive."**
>
> (Sustainable Business Network & Grant Thornton New Zealand, 2022, p.3).

A circular economy limits waste and pollution, keeps products in use, and regenerates natural systems to protect, not pillage, natural resources. New Zealand's economy currently follows the unsustainable, 'take-make-dispose' linear pattern, which fuels overconsumption of natural resources, excessive production of waste and greenhouse gas emissions, and the degradation of natural systems. To circularise our economy and return New Zealand to a safe operating space, it will be necessary to reduce the use of natural resources and novel entities.[3] This requires creative, ambitious and transformational product policy, underpinned by legislation.

> "...our use of resources must diminish dramatically if we want us, our children and our planet to survive… we have to change our habits and our way of working, consuming and living. A bit of change will not do, we have to reduce our use of primary resources quite dramatically." (Backes, 2017, pp.9-10).

A common misconception is that the circular economy is all about recycling or discovering new uses for waste products (De Groene and Ethica, 2015, p.12). In actual fact, "the circular economy is a new productive paradigm that goes far beyond waste management or recycling" (Vence & de Jesus Lopez Perez, 2021, p.3). Currently, 25% of global greenhouse gas emissions come from the extraction and processing of raw materials for production (Hann et al, 2022, p.8), which cannot be effectively mitigated via an end-of-pipe waste management focus alone.

[3] Persson et al (2022) define novel entities as "entities that are novel in a geological sense and that could have large-scale impacts that threaten the integrity of Earth system processes". They draw on the definition of Steffen et al (2015): "new substances, new forms of existing substances, and modified life forms that have the potential for unwanted geophysical and/or biological effects".

Accordingly, a circular economy primarily aims to reduce waste, pollution and emissions ***at source***, by rethinking how we produce and consume, and intervening up production chains to **reduce extraction of the planet's raw materials** (Backes, 2017, p.14; Ekins, 2019, p.17; Vence & de Jesus Lopez Perez, 2021, p.4; World Bank, 2022, pp.25-26; Bianchi and Cordella, 2023).[4] The less is extracted, the less damage done to ecosystems and the more waste and emissions are reduced.

Text Box 1: Defining the Circular Economy in law - the Irish Circular Economy Act 2022

Section 6 of the Circular Economy and Miscellaneous Provisions Act 2022 (Ireland) defines the circular economy as:

> "... an economic model and the policies and practices which give effect to that model in which—
>
> (a) production and distribution processes in respect of goods, products and materials are designed so as to minimise the consumption of raw materials associated with the production and use of those goods, products and materials,
>
> (b) the delivery of services is designed so as to reduce the consumption of raw materials,
>
> (c) goods, products and materials are kept in use for as long as possible thereby further reducing the consumption of raw materials and impacts harmful to the environment,
>
> (d) the maximum economic value is extracted from goods, products, and materials by the persons using them, and
>
> (e) goods, products and materials are recovered and regenerated at the end of their useful life"

The goal of designing out pollution and regenerating natural systems also necessitates **a reduction in the toxicity of materials and products** throughout their lifespan (World Bank, 2022, pp.22-23; Ellen MacArthur Foundation, 2021, p.35).[5] As Alaranta and Turunen note:

[4] See, for example, Ekins et al (2019, p.17): "... the purpose of moving towards a circular economy is to slow depletion of scarce natural resources, reduce environmental damage from extraction and processing of virgin materials, and reduce pollution from the processing, use and end-of-life of materials. The main means of achieving this is through increasing the efficiency and productivity of resource use and reducing the quantity of material disposed of." Also, Backes (2017, p.14): "...a circular economy is not a new way of waste recycling. It is a fundamentally different approach, a radical change of thinking and behaviour. The transition to a circular economy is a systemic change. We have to rethink our ways of producing and consuming..."

[5] See, for example, the extensive reference to safe, non-toxic/toxic-free products in the European Parliament resolution of 10 February 2021 on the New Circular Economy Action Plan (2020/2077(INI)), and to "a non-toxic circular economy" and "non-toxic material cycles" in paragraph 8 of the preamble of the proposed Eco-design for Sustainable Products

> "It is obvious that the CE does not merely involve using materials in an efficient way. It must also be ensured that the materials do not cause adverse impacts on human health and the environment." (2021, p.115).

A simple focus on recirculating products and secondary raw materials without a broader focus on regeneration can create unintended chemical risks and unwittingly "dilute, disperse and accumulate" hazardous substances throughout the economy and environment (Johansson, 2022).

This holistic picture of the circular economy is communicated in the butterfly diagram (Fig. 1) and the waste hierarchy (Fig. 2), which are sometimes combined in the 'circularity ladder' concept (Fig. 3). These schema communicate that some strategies for reducing waste and resource use should be prioritised as they are more effective at drawing down emissions and pollution, whilst generating wellbeing. The most effective strategy is to **prevent or minimise production and toxicity** in the first place through system-level redesign of products and services. Meanwhile, reuse activities—where people are fairly remunerated to **keep the products that we do create intact, functional and highly-utilised** for as long as possible—help us to reduce pressure on natural systems, while continuing to meet society's essential needs. These reduce and reuse strategies can be described as '**product circularity**', which is distinct from 'material circularity' that focuses on activities like recycling (Hann et al, 2022, p.6). Ensuring product circularity occurs safely, without the circulation and accumulation of harmful substances, can be described as '**detoxifying loops**'.

In essence, socio-economic systems should pursue non-toxic, product circularity activities higher up the waste hierarchy or circularity ladder, or towards the 'inner loops' of the butterfly (de Groene and Ethica, 2015, pp.13-14; Scottish Government, 2022, pp.6-7; Maitre-Ekern and Dalhammar, 2016, p.378). Adhering to this schematic prioritisation highlights **the importance of product policy and product circularity for achieving a circular economy**, and aligns the circularity mission with UN Sustainable Development Goal 12: Ensure sustainable production and consumption patterns (European Parliament resolution 2020/2077(INI), para G; Scottish Government, 2022, p.8).

The following section of the paper outlines how circular business models can be seen as a critical mechanism for moving production and consumption systems up the waste hierarchy.

Regulation (EU) - Proposal for a regulation of the European Parliament and of the Council establishing a framework for setting eco-design requirements for sustainable products and repealing Directive 2009/125/EC (2022/0095 (COD)).

Fig. 1: Circular Economy Butterfly Diagram

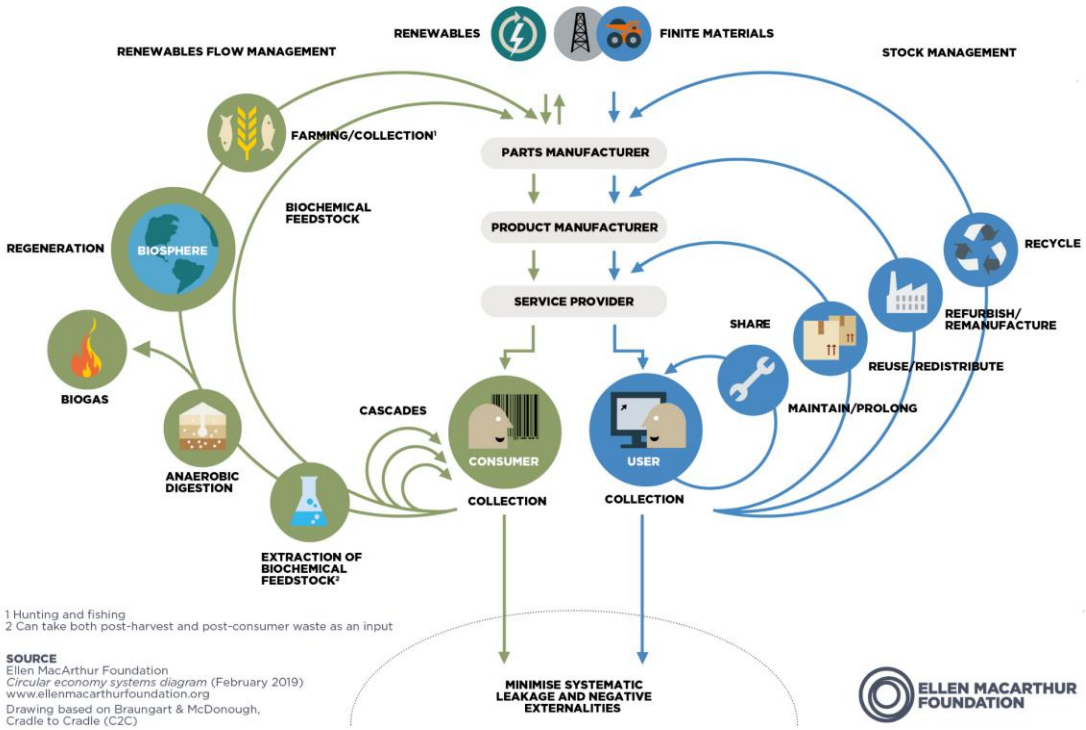
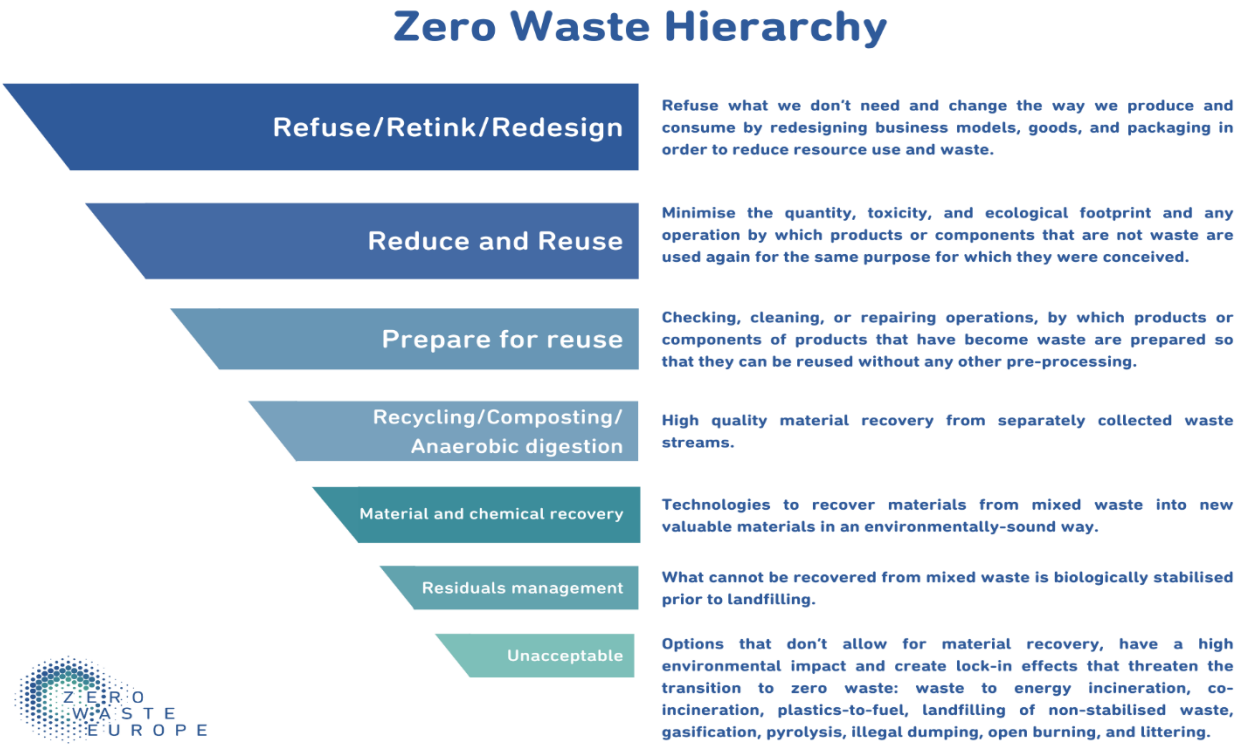


Fig 2: The Zero Waste Hierarchy



3

Moving up the waste hierarchy and towards the inner loops: The role of products and business models

Moving up the waste hierarchy and towards the inner loops: The role of products and business models

> **"... nearly all the resources we still use are extractive and not regenerative. The vast majority of businesses within Aotearoa New Zealand are still linear with a take, make, waste mindset. We take what we want from the environment to make products which end up as waste at the end of their often-short lifespans."**
>
> (Sustainable Business Network and Grant Thornton New Zealand, 2022, p.6)

Moving economic activity towards the top layers of the waste hierarchy or the inner loops of the butterfly diagram has been described as a "profound transformative change" (Hobson, 2015 cited in Merli et al, 2018, p.717). For example, to operate within the Earth's biocapacity, Europe may have to diminish its consumption of primary resources by at least 60%, but perhaps as much as 90% (Backes, 2017, p.11). Meanwhile, staying within the remaining carbon budget will require both a reversal of increasing rates of material consumption *and* real reductions in material consumption for all key material sectors (aluminum, iron and steel, cement and concrete, and plastics), with "drastic action" likely required for cement and concrete (a 50% drop in per capita consumption by 2030), and plastics (a 75% drop in per capita consumption by 2050) (Hann et al, 2022, pp.18, 24, 28).

New Zealand is one of the most wasteful countries in the world (MfE, 2021, p.17), so we have big reductions to make in resource consumption. However, no country is excelling at circularity. The entire global economic system is only 7.2% circular; this figure must increase to stay within 1.5°C of global warming, but is instead dropping over time as material extraction continues to grow (Circle Economy, 2023). A study by Bianchi & Cordella

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(2023) found that the resources currently saved by circular economy initiatives are exceeded, four times over, by the resources extracted annually to keep up with economic growth (Bianchi & Cordella, 2023). Current trajectories indicate that global material use will double, from 2015 to 2060, triggering overshoot of the 1.5°C limit, *even if* non-material sectors manage to stay within the remaining carbon budget (Hann et al, 2022).

Humanity is also off-piste for ensuring a *safe*, circular economy, having overshot the planetary boundary for novel entities/chemical pollution (Persson et al, 2022). Regaining control will be a formidable task. Even in the European Union, home to one of the world's strictest legal regimes for hazardous substances, about 85% of substances in circulation are unregistered with the regulatory body, and only a small percentage of known hazardous substances are restricted or banned from use (Johansson, 2022, pp.2-3).

> "We cannot tolerate the presence of persistent organic pollutants in materials and waste, otherwise there will be no circular economy… but an economy of toxic recycled products." (Martin Hojsik, Member of the European Parliament for Slovakia, 2022)[6]

Increasing circularity and reducing material usage and pollution will require a legislative reset of the economy's underlying rules to drive new business models based on product circularity, and less harmful products (Blumhardt and Prince, 2022, pp.74-75; Ekins, 2019, p.17; Hann et al, 2022, p.28). Currently, inefficiency and overconsumption are baked into our socio-economic systems, which normalises and incentivises linear behaviour at the bottom of the waste hierarchy, from both producers and consumers (World Bank, 2022). For example:

- We buy and make stuff we just don't need, and products are over-duplicated and under-utilised (i.e. we have more circulating in the economy than is needed to 'do the job').
- Too many products are shortlived or disposable because most business models derive profit from continual product replacement rather than through servicing and maintaining existing products.
- Too many products and materials aren't designed for recycling or for accepting recycled content. Only some recycling systems recycle products back into the same kind of product (closed-loop), so the recycling process often isn't operating to substitute raw material extraction.
- Laissez-faire approaches to chemical safety permit widespread use of unsafe or toxic substances in product manufacture, creating human and environmental health risks and

[6] Cited in European Parliament (3 May 2022) "Circular Economy: MEPs want to reduce harmful chemicals in waste" (Press release). https://www.europarl.europa.eu/news/en/press-room/20220429IPR28233/circular-economy-meps-want-to-reduce-harmful-chemicals-in-waste.

compromising the safety of reusing and recycling products and materials (Johansson, 2022).

Circular behaviours that replicate closed, inner loops at the top of the waste hierarchy (e.g. product circularity) minimise resource consumption and pollution and make the most of the energy and resources embodied in products that already exist. Product circularity can be mainstreamed through widespread adoption of **new business models** that no longer rely on continually producing new stuff to generate profits. For example, business models that promote **systemic redesign of products and services** for reduced production and consumption, such as **sharing/access models, durability and modularity, reusability, repairability, non-toxicity, and practices of reuse, repair and remanufacture** (De Groene and Ethica, 2015; Merli et al, 2018, pp.718-719; Ballardini et al, 2021; Maitre-Ekern & Dalhammar, 2016). Improved chemical regulation and material content transparency across product lifespans can support detoxification.

Successfully implementing new business models and improved chemical regulation could mean:

- Far fewer products enter the economy in the first place (e.g. less "stuff"), due to sharing and product-as-a-service models (reducing overall material extraction).
- Products have longer lifespans because they are designed for durability and reuse, including repair, keeping both the product and its embodied resources in circulation at their highest and best use for as long as possible, before eventual recycling in a closed-loop process.
- Products do not contain harmful substances and can recirculate safely, causing minimal harm to people and planet.
- Many more third-party businesses and work opportunities in providing services that enable products to be shared and recirculated (e.g. delivering and maintaining sharing platforms, reuse systems and repair).

Text Box 2: Articulating hierarchies in legislation - the Circular Economy (Waste Reduction and Recycling) Act 2021 for the Australian State of Victoria

Section 8 of the Circular Economy (Waste Reduction and Recycling) Act 2021 sets out a "**Circular economy hierarchy**" stating:

(1) Products and materials should be designed, produced, marketed and delivered, and any waste should be managed, in accordance with the principles set out in subsections (2) and (3)

(2) A circular economy is prioritised, having regard to the entire life cycle of products and materials, including by—

(a) producing and designing products and materials—

(i) with a reduced reliance on raw or virgin materials; and

(ii) to be reusable, durable, repairable and shareable; and

(iii) to have an extended life cycle; and

(iv) in a manner which eliminates waste or pollution; and

(v) in a manner that reduces the environmental impacts of production and consumption by—

(A) making productive use of natural resources and goods; and

(B) maximising the productive use of re-manufactured, reused, recycled and renewable resources; and

(b) promoting initiatives that support repairing and reusing products and materials so as to create more value in them; and

(c) marketing and delivering products and materials in a manner which avoids unnecessary or excessive purchasing or use of other products; and

(d) fostering action or innovation to manage climate change impacts and reduce greenhouse gas emissions.

(3) Where waste does arise from the production and use of products and materials, it should be managed in the following order of preference—

(a) waste should be avoided;

(b) waste should be minimised;

(c) waste should be reused;

(d) waste should be recycled;

(e) energy and other resources should be recovered from waste;

(f) waste should be treated so as to reduce the potential impacts of degradation;

(g) waste should be disposed of.

Understanding circular business models for reduction and reuse

Circular business models (CBMs) can be understood in slightly different ways. Merli et al (2018) distill two overarching types of CBMs from the literature: 1) "**Slowing resource loops**" 2) "**Closing loops**":

> "The first concerns the creation of products with longer life and the development of product reuse practices. The second consists in creating value from what in a traditional linear model is considered as waste" (Merli et al, 2018, pp.713-714).

This paper distills 5 main categories of CBMs within these two overarching types (Table 1), following a scan and consolidation of several sources (Sustainable Business Network and Grant Thornton New Zealand, p.8; OECD, 2019, pp.23-40; Lacy et al, 2020; De Groene & Ethica, 2015, pp.22-23).

Table 1: Circular business model categories

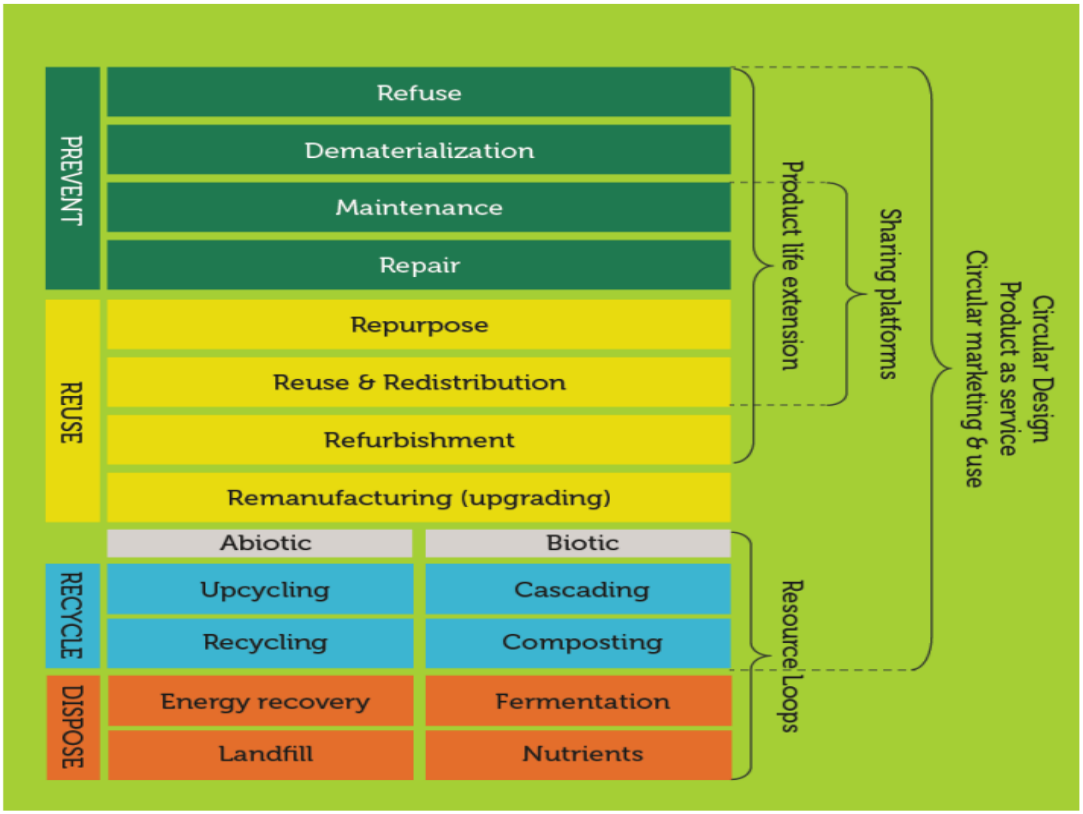
Slowing resource loops	
Product as a service (PaaS)	The business model combines a product, with a service component. Rather than selling physical ownership of the product, the business sells the use of the product, or a service outcome from the product. Product ownership either remains with the business, or the product itself is dematerialised. For example, subscriptions for digital newspapers or streamed music and films; access to transport or appliances (e.g. public transport or laundromats); leasing/rental (e.g. car sharing, e-scooters, office printers); or performance contracting (e.g. Why Waste serviced worm farms).
Product life extension	Businesses build products to last through robust design (sometimes called 'classic long life model') and through offering or facilitating post-purchase product reuse services or maintenance/repairs. Also includes third party businesses that specialise in reuse/repair activities that recirculate products and avoid a premature end to their service life (e.g. third party repair firms, resource recovery operators with a reuse element, or secondhand goods resellers, like op-shops).
Sharing/ use optimisation	Businesses/organisations establish peer-to-peer platforms to increase the efficiency of underutilised consumer assets. For example, apps that facilitate co-access to consumer-owned products, e.g. ride share/carpooling or AirBnB, or that match strangers with complementary needs to undertake a transaction, e.g.

Slowing resource loops	
	ShareWaste; or libraries that facilitate co-ownership of products, like tools, toys or books. Sharing is typically peer-to-peer (distinguishing it from PaaS), and platforms facilitate temporary, rather than permanent, transfer of product ownership, distinguishing them from secondhand goods sales platforms (e.g. TradeMe).
Closing Loops	
Circular materials/ circular supply/ resource recovery	Businesses/organisations that manufacture, or facilitate the manufacture of, products from non-toxic, renewable or recycled resources. For example, processors of secondary materials, those involved in the resource recovery sector, and businesses that manufacture products using secondary materials. The business model may be based on providing a council-contracted or user-pays resource recovery service (such as a kerbside recycling collection or operating a physical drop-off and sorting centre for materials), or based on selling the secondary material or products made from secondary materials, e.g. glass manufacturers selling glass bottles containing recycled cullet.
Industrial symbiosis	Business practices or products that use one industry's waste as another's raw material inputs.

Business models that fall within the **slowing resource loops** category most closely reflect inner loop/top of the waste hierarchy approaches (see De Groene and Ethica's overlay of business model types on the circularity ladder, Fig. 3). Therefore, sharing, PaaS, durability, reuse and repair are relevant activities for the circular economy and warrant legislative promotion (Ballardini et al, 2021, p.8). However, in academic commentary, business practice and law, slowing resource loops business models receive far less attention than closing loops models (De Groene & Ethica, 2015, p.3; Merli et al, 2018, pp.714, 718-719; Ballardini et al, 2021, pp.2-3; Stumpf et al, 2021, p.11; OECD, 2019, p.98), perhaps because adopting and mainstreaming these models, and other techniques of slowing resource extraction, require structural changes to consumption and production patterns and regulatory frameworks (Merli et al, 2018, pp.703,718; Ballardini et al, 2021, p.1; Stumpf et al, 2021, p.11).

One limitation of the CBM framework is that it underemphasises business model strategies for 'detoxifying loops'. Some commentators have noted a tension between achieving circularity and protecting human and environmental health (Johansson, 2022; Alaranta & Turunen, 2021; World Health Organization Regional Office for Europe, 2018). This is not because the circular economy concept is unconcerned with toxicity, but because existing

Fig. 3: The Circularity Ladder (overlaid with CBMs), from De Groene & Ethica (2015)



regulatory regimes for different parts of the production-consumption supply chain (e.g. upstream chemicals/hazardous substances regulations, and downstream waste regulations) have developed in silos, with differing objectives (Alaranta and Turunen, 2021; Johansson, 2022). Aligning these regimes with each other, and with the circular economy framework, so that materials are regulated for safety throughout the flow of their entire lifecycle(s), now requires conscious and deliberate effort (Johansson, Velis & Corvellec, 2020; Alaranta & Turugen, 2021, p.116). So, in relation to circular business models, detoxification considerations should be overlaid across every category, including the **slowing resource loops** models.[7]

The following section of the paper considers Governments' potential role in supporting and accelerating the transition to non-toxic, slowing resource loop business models.

[7] It should be noted that, in the short-term, detoxifying loops may conflict with circularity due to the need to remove (rather than reuse) products with legacy substances from product loops (Alaranta & Turugen, 2021).

4

Legislative action is needed

Legislative action is needed

> **"The business community needs effective incentives and easy access to government funding for circular initiatives. It also needs penalties for linear businesses to send a strong message about the new way forward… The message to government is loud and clear. Our progress towards circularity is too slow because businesses will not move from a linear model until it is in their best interests to do so. Customers are reluctant to pay for circular products until they can compete at the checkout. We need to tilt the playing field the other way. The biggest influencer in this shift is the Government… [who] must rapidly transition to policies that support circular economies and provide not only the blueprint for subsequent legislation, but the legislation itself."**
>
> (Sustainable Business Network & Grant Thornton New Zealand, 2022, pp.4&12).

The market share for **all** types of CBMs is small, sitting at about 5 to 10%, globally (OECD, 2019, p.13; World Bank, 2022, p.78). According to the Sustainable Business Network & Grant Thornton New Zealand: "Although there are already many businesses with circular business models within Aotearoa New Zealand, they are a minority" (2022, p.3). This is due to financial barriers preventing businesses from becoming circular, and the as-yet unrealised role of government in setting incentives for business to deliver change. International assessments replicate this analysis (e.g. Ellen MacArthur Foundation, 2021; World Bank, 2022).

Removing the barriers to circular activity at the top of the waste hierarchy requires a range of policy interventions (Bianchi & Cordella, 2023, p.7), including targeted and ambitious legislative action. As noted by the World Bank (2022):

> "... financing the CE will not take off in the absence of the reform of policies that continue to support linear models. **The CE calls for a new reform agenda.** Promoting CBMs without dismantling the linear economy and the policies supporting it is inefficient and insufficient. It may well continue to foster the emergence of niche markets and products, but it will remain inadequate in decoupling welfare creation from material consumption." (p.18)

However, the nature of the legislative action required for circular activity at the top of the waste hierarchy remains underexplored, as noted by Ballardini et al (2021, p.3):

> "... the idea of promoting repairability, refurbishability, reusability and shareability of products has emerged in political vocabulary, but the law in force is still quite underdeveloped in these respects."

This working paper suggests that **the New Zealand Government can use primary legislation (e.g. a Parliamentary Act) to create many of the powers needed to move economic activity up the waste hierarchy or towards the inner loops of the circular economy butterfly**. While these enabling powers could be housed in various pieces of legislation, presently, there is an opportunity to include them in the proposed update of New Zealand's waste legislation (Waste Minimisation Act 2008 (WMA)). Indeed, the Ministry for the Environment has already identified this opportunity, having noted in the consultation document on the update of the WMA (2021, p.61) that:

> "… it would be useful to include more powers that encourage circular economy behaviours towards the top of the waste hierarchy, such as redesign and rethinking of systems of production and use."

It is right to be mindful that waste law provides "insufficient means for promoting the flourishing of economic activities around the concept of the CE" and that "product policy comes much closer to the heart of the CE than waste policy" (Ballardini et al, 2021, pp.2-3). However, New Zealand's WMA expands beyond waste policy (despite its name), providing the main home for the country's existing product policy and product stewardship provisions. Section 23 of the Act houses the main set of powers for regulating products, materials or waste, from phasing-out problematic products and substances, to establishing critical behaviours and practices for the cycling of materials and products, and internalising externalised costs. These powers are:

- Controlling or prohibiting the sale or disposal of products/materials
- Establishing take-back services for products
- Setting fees to pay for managing a product (across the lifecycle, not just end-of-life)
- Establishing deposit return systems
- Prescribing product labelling requirements
- Setting quality standards for reusing, recycling or recovering materials

Despite having this regulatory toolbox at its disposal, Government has greatly under-utilised s 23 of the WMA, having only used one power (the prohibition power) since the Act's enactment in 2008, and only on three occasions. However, even if s 23 had been heavily utilised, the provision does not currently enable many critical actions for driving circular behavior that are being implemented overseas or suggested in secondary literature. This paper suggests a refurbish of the s 23 toolbox to introduce new powers that are currently absent,

and to update existing powers to give them more utility and clarity. To maintain flexibility, **it is important that these enabling powers continue to be available regardless of whether or not a product is a "priority product" subject to a product stewardship scheme**.

The remainder of this paper explores some of these key powers in-depth, grouped by the seven themes listed in Fig. 4.

This paper suggests that the New Zealand Government can use primary legislation to create many of the powers needed to move economic activity up the waste hierarchy or towards the inner loops of the circular economy butterfly.

Fig. 4: Seven themes of the legislative measures for circular production and consumption discussed in this paper

Prior to discussing these powers, it is necessary to make two notes.

First, many outcomes could be achieved directly through primary legislation, in addition to creating and expanding regulation-making powers. Hinging the development of product policy on the latter alone is indirect and regulatory follow-through is not guaranteed (as the dearth

of activity under s 23 demonstrates). An 'and/and' approach that creates enabling powers alongside actions that come into effect with the Act's passing could reduce delay or stagnation. Therefore, this paper explores overseas examples of both direct legislative provisions and enabling powers. The paper also discusses measures that may require progression via other pieces of legislation, e.g. tax, consumer, contract, hazardous substances, or intellectual property laws. These actions are relevant to consider, even if they go beyond the WMA.

Second, this paper analyses individual powers separately; this should not be read as an indication of how such powers should be invoked. No silver bullet exists for the circular economy transition. Circularity is complex and requires multi-faceted action whereby laws, regulations and policies are invoked together, in packages, via a comprehensive policy framework (Milios, 2020, pp.79,495). Even subsets of circularity, such as resource efficient product design, demand a combination of tools and approaches (Maitre-Ekern & Dalhammaer, 2016, p.381). Not only will each individual instrument likely perform better in tandem with others, but the best overall material reduction gains will likely come from integrating economic measures, regulatory actions and wider social policies. World Bank modelling (2022) indicates that combining multiple instruments that target upstream design and downstream consumption almost doubles the material reduction impact of deploying any measures individually (p.96), which "supports the idea of introducing integrated policy packages to achieve CE objectives." (p.97). The OECD concluded similarly in a 2020 report:

> "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… The OECD calls for ***applying mixes of policy instruments to ensure a coherent set of incentives for resource efficiency along the product value chain***. [emphasis added]"

These conclusions consist with modern approaches to policy design that recognise complex policy problems should be addressed by "bundles or portfolios of tools", rather than single instruments in isolation (Howlett et al, 2015). To date, New Zealand's sparse use of the s 23 powers has followed a blunt approach of isolated product bans. Reappraising this approach is a question of legislative design, but also policy (and politics). Both the WMA update and the upcoming Circular Economy Strategy should consider techniques to encourage more holistic use of regulatory powers and policy measures to achieve robust circular economy objectives (alongside a reframe of how product stewardship schemes are designed (see Blumhardt, 2021)).

5

Powers and legislative measures for circular products, production and consumption

Powers and legislative measures for circular products, production and consumption

All examples discussed in this section can be found in the living document Legislative Measures and Powers for Circular Products, Production and Consumption that accompanies this working paper. This paper's analysis is a snapshot in time, as updates to the spreadsheet are ongoing. NB: The spreadsheet is set to view only; on the left of the toolbar (left of the green View Only button), it is possible to select the funnel/filter button to create a temporary filter view that enables easy navigation of the document (e.g. filtering rows by type of legislative measure or jurisdiction).

Theme 1: Bans and restrictions

The power to prohibit or restrict certain materials, substances, products or activities—either outright or in certain contexts—or to place a ban or moratorium on future production, is one way to embed prevention into product policy or work towards designing out waste and pollution. Such a power enables governments to phase-out items or practices that are inconsistent with a safe, circular economy, to send a strong signal to the market and, in turn, foster the certainty needed to redirect investment and innovation. As bans and restrictions can cut across property rights and investment certainty, these concerns must be managed in the design of policy measures employing these powers. For example, through consultation with impacted industries and phase-in transitional provisions to avoid disruption. With such precautions in place, powers to ban or restrict activities or products are a common feature of many spheres of government action, such as environment protection, biosecurity, health, workplace safety, and product safety.

International examples

Analysis of the bans applied internationally show that these can be articulated in various ways (see Table 2). An enabling power should be drafted with these options in mind, to ensure flexibility to implement prohibitions or restrictions in different circumstances, for different products, substances and materials.

Table 2: Types of bans and restrictions

Type of ban	Examples
Blanket product or substance ban	Section 140 of the **UK Environmental Protection Act 1990** creates a broad power to prohibit or restrict "any specified substance or article" if "appropriate to do so for the purpose of preventing the substance or article from causing pollution of the environment or harm to human health or to the health of animals or plants".
Product ban/ restriction based on presence of specific material	Plastic product bans, which are increasingly common around the world, fall in this category. Another common example are bans on products containing substances deemed hazardous or harmful. For example, in the **USA**, several states have adopted bans of certain products containing PFAS, including Maine, Washington State and Santa Rosa City in California. In the EU, **Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment** requires Member States to ban electrical and electronic products containing substances like lead, mercury and cadmium. This law has been transposed in France in the **Environmental Code, Article R543-171-3**. In 2015, France also prohibited the importation and sale of any food packaging containing BPA. Many jurisdictions have banned toys and children's products that contain substances like phthalates and heavy metals.
Product characteristic (material agnostic) ban	Section 14 of the Irish **Circular Economy and Miscellaneous Provisions Act 2022** creates a power to make regulations banning certain single-use items (including single-use packaging). Unlike many single-use bans in other countries that are based on plastic material content, this provision focuses on the single-use characteristic. The interpretation section of the Act (s 6) defines single-use as "not reusable" and defines "reusable" by drawing on the ISO definition. By focusing on the product characteristic rather than the material, this provision avoids the problem of "regrettable substitution" where single-use plastic is replaced by a single-use product made of something else. **Balearic Islands Waste and Polluted Soils Law (Law 8/2019)** also contains provisions banning non-reusable/non-rechargeable shaving razors, non-reusable/rechargable printer toners/cartridges, and lighters that cannot guarantee 3,000 lights. Meanwhile, **the City of Quezon in the Philippines** has also prohibited all hotels in the city from distributing toiletries in any single-use sachets or containers (material agnostic).
Situational or contextual product ban	In some situations, a specified product will be banned only in certain locations or contexts. Bans like this can be useful transitional measures if it is not deemed feasible to ban a product outright; slowly restricting access to the product makes a full phase-out possible over time (see, for example, the **Taiwanese staged approach to a full phase-out of various single-use items** by 2030).

Type of ban	Examples
	For example, **Chile** has banned all food establishments from using any single-use serviceware for dine-in customers (effective from 2024). Similarly, Article 23 of the **Balearic Islands Waste and Polluted Soils Law (Law 8/2019)** bans the use of single-use serviceware and single-serve condiments for customers who are eating on the premises (i.e. 'have here'). The same law also bans the provision of beverages in single-use packaging in all buildings hosting public services. In the **USA**, several jurisdictions have banned food and beverage facilities (including online delivery) from providing disposable foodware accessories (e.g. cutlery, condiment packets, cup lids), except on request of the customer. In Taiwan, Article 13 of the **Resource Recycling Act 2009** creates the power to make situational bans, stating that the Environmental Protection Agency "may officially announce and designate the restriction or prohibition of the use of goods, packaging, or containers… on public or private premises." The Taiwanese **Waste Disposal Act** also creates a broad product ban power that enables situational bans, such as the 2020 ban on department stores, shopping centres and retail stores providing single-use utensils, of any material, to customers eating on the premises.
Specified activity ban	A common example of a specified activity ban is a ban on landfilling particular products. However, this is focused on end-of-life activity. An activity ban focused on prevention and reduction includes the Irish ban in the **Circular Economy and Miscellaneous Provisions Act 2022** that prohibits the Minister from granting new licenses for coal, lignite, oil shale exploration, which essentially prevents extraction. France has introduced some novel bans on particular activities. For example, under the **Consumer Code, Article L213-4-1** passed in 2015, France criminalised the act of planned obsolescence, which now attracts a penalty of up to 2 years' imprisonment or a 300,000 euro fine. The French **law relating to anti-waste and the circular economy** also banned the act of providing certain items for free, such as free plastic toys with children's meals, or free plastic bottles of drink in institutions open to the public. The law also prohibits sponsors from imposing free or paid distribution of plastic bottles of drink at cultural, sporting or festive events. Under this same law, France also became the first country in the world to ban the destruction of unsold products, including textiles, electronic products, sanitary products, shoes, books and household appliances. Scotland is currently consulting on a similar provision for their **proposed Circular Economy Bill**; the EU Commission has included a proposal to ban the destruction of unsold goods in its **proposed Eco-design for Sustainable Products Regulation** that would replace the current Ecodesign Directive.

Situation in New Zealand

Section 23 (1) of the Waste Minimisation Act 2008 hosts the current enabling power for bans, which is phrased as follows:

> *Control or prohibition on disposal, sale, etc*
>
> (a) controlling or prohibiting the disposal, or anything done for the purpose of disposing, of products or waste:
>
> (b) controlling or prohibiting the manufacture or sale of products that contain specified materials:

Paragraph (a) can be categorised as **a specified activity ban, though it is narrowly focused on the act of disposal**. The power has never been used, but the original intention was probably to cover landfill bans on end-of-life products (and controlling where certain materials are landfilled, such as hazardous waste). While it could likely cover a ban on landfilling unsold goods, it does not extend to other types of activities beyond the act of disposal.

Paragraph (b) can be categorised as **a product ban based on the presence of a specific material**. The power would permit bans on products containing harmful substances (e.g. bans on plastic baby bottles containing BPA). However, it would not permit a standalone substance ban (such a ban must be tied to a specific product), which may become overly restrictive if the Government wishes to more closely manage harmful chemicals in the economy.

The phrasing of s 23(1)(b) essentially blocks material agnostic bans based on product characteristics or situational bans. This is restrictive given that steps up the waste hierarchy focused on business models are likely to centre on product/service/system characteristics, not only materials (e.g. single-use vs reuse). Material content bans are useful, but are not always the best tool for the job. For example, they can create the risk of regrettable substitution, or fail to address systemic aspects of the linear economy, e.g. businesses may replace banned single-use plastic products with single-use products made of other materials that have their own environmental impacts.

The inability to introduce situational product bans—e.g. the use of certain products in public buildings, or a ban on disposable serviceware for 'have here' contexts—reduces Government flexibility to restrict access to problematic products in ways other than a blanket product ban. Situational bans allow Government action on products for which a full ban is not deemed possible yet (e.g. disposable coffee cups), enabling reduced consumption of such products in the meantime, creating a market for alternative systems that will go on to make a future full

phase-out more feasible, while simultaneously socialising the idea of a full ban at a later date (as per the Taiwanese approach to single-use food and beverage items).

Table 3: Examples of more flexible enabling powers for bans

Law	Provision
Title: Recycling and Waste Reduction Act 2020 **Provision:** s 92 **Jurisdiction:** Australia, Federal Act **Notes:** Ban power available in the context of a mandatory product stewardship scheme	**92 Mandatory product stewardship requirements may be prescribed by rules** *Basic rule—requiring person to take, or not take, specified action* (1) The rules may require one or more specified persons to take, or not to take, specified action in relation to a specified product. ... *Specific action covered by subsection (1)* (3) Without limiting subsection (1), rules made for the purposes of that subsection in relation to a product may do any or all of the following: (a) prohibit (either absolutely or subject to conditions), limit, restrict or otherwise affect the manufacture, import, export, distribution or use of the product; (b) prohibit (either absolutely or subject to conditions), limit or restrict substances from being contained in the product ...
Title: Environmental Protection Act 1990 **Provision:** s 140 **Jurisdiction:** UK	**140 Power to prohibit or restrict the importation, use, supply or storage of injurious substances or articles.** (1)The Secretary of State may by regulations prohibit or restrict— (a)the importation into and the landing and unloading in the United Kingdom, (b)the use for any purpose, (c)the supply for any purpose, and (d)the storage, of any specified substance or article if he considers it appropriate to do so for the purpose of preventing the substance or article from causing pollution of the environment or harm to human health or to the health of animals or plants. (2)Any such prohibition or restriction may apply— (a)in all, or only in specified, areas; (b)in all, or only in specified, circumstances or if conditions imposed by the regulations are not complied with; and (c)to all, or only to specified descriptions of, persons…

Theme 2: Mandates and obligations

The flipside of bans are mandates or positive obligations to do something. Mandates can accompany a ban, to direct people to a better alternative. Mandates can also overlap with binding targets or quotas, in the sense that a 100% quota is essentially a mandate. Mandates and obligations are a more direct/prescriptive alternative to market-based incentives for inducing circular behaviours from different actors in the economy.

International examples

Analysis of international examples shows mandates are often used to create obligations for a wide range of actors, not limited to producers. For example, it is not uncommon for users and distributors of products at the retail level to be subject to mandatory requirements. Obligations may also be imposed on Government actors, such as Ministers or Member States (in the case of Europe). Producer obligations are often implemented in the context of product stewardship schemes, for example, take-back requirements.

Table 4: Examples of mandates and obligations categorised by key target

Target of mandate	Examples
Hospitality	A number of jurisdictions have passed laws requiring that hospitality outlets only use reusables for dine-in customers. Such a mandate has been passed at a national level in **France**, and **Chile** (to come into effect in 2024), while several city and state jurisdictions have passed similar mandates, e.g. in the **USA** and the **Philippines**. **Taiwan** and **Germany** have passed laws obliging hospitality outlets who offer takeaways to have a reusable takeaway container option. Germany's law is particularly expansive and covers all prepared food and drink, and extends to delivery services as well. The law stipulates that the reusable option must be equal or cheaper in price than the single-use container option, and retailers must take back any reusable containers they supply. Several jurisdictions have also passed laws requiring hospitality outlets to accept customers' own reusable takeaway containers. In Spain, article 25 of the **Balearic Islands Waste and Polluted Soils Law (Law 8/2019)** requires hospitality outlets to provide free non-packaged water. France has created a similar obligation for bars and restaurants in its **law related to anti-waste and the circular economy**.
Retailers	In **France** it is compulsory for retail stores to allow consumers to be served in BYO containers for unpackaged products; and retail shops of 400 square metres or larger

Target of mandate	Examples
	must provide reusable containers (for free or for purchase) when selling items without packaging (e.g. in bulk bin aisles). In **Chile**, supermarkets and beverage vendors must offer beverages in reusable/returnable bottles and accept empty reusables bottles returned by consumers for take-back.
Public institutions, venue and events	On the **Spanish Balearic Islands**, it is compulsory for events supported by the public sector to ensure access to a non-packaged (or reusable packaged) water supply, and all establishments open to the public in **France** must be equipped with at least one accessible drinking water fountain.
Producers	In the **Flanders region of Belgium**, there is a legal obligation for producers to take-back electronic equipment, including for reuse. The legislation requires producers to send collected products to the region's accredited reuse centres, before being sent to recycling, in order to maximise reuse outcomes.
Government actors	Circular economy and waste prevention laws can create binding obligations on government actors. For example, s 14(7) of the **Irish Circular Economy and Miscellaneous Provisions Act 2022** requires the relevant Minister to produce a report "examining how single-use packaging used in the sale of fruit and vegetables can be reduced". In Chile, the **Single-Use Plastic Reduction law** requires the Ministry of Environment to implement environmental education programs aimed at citizens to foster awareness of the impact of single-use products, and to promote reusable and returnable product use. Sometimes obligations relate to public procurement, such as the **Italian Code for Public Contracts**, which establishes mandatory sustainability criteria in public procurements, including criteria relating to resource efficiency, and reducing hazardous materials and waste products. At the EU level, Directives are binding on Member States (even if these directives are not prescriptive of measures) and can create a range of obligations relating to policies at the top of the waste hierarchy. For example, Article 9 of the **Waste Framework Directive** prescribes that Member States should take measures to prevent waste generation, including promoting and supporting sustainable production and consumption models, promoting the reduction of substances of very high concern in materials and products, encouraging the reuse of products and setting up systems to promote repair and reuse activities, and encourage the right to repair (e.g. availability of spare parts and diagnostic information). Article 11 requires that Member States shall take measures to promote preparing for reuse activities, notably by: encouraging the establishment of and support for preparing for reuse and repair networks, by facilitating their access to waste held by collection schemes that can be prepared for reuse, and by promoting the use of economic instruments, procurement criteria, quantitative objectives or other measures.

Situation in New Zealand

Currently, the WMA contains three enabling powers that *might* permit mandates or obligations in relation to products of the kind described in the international examples above. However, they are either too narrow in their potential application, or too vaguely worded to guarantee fitness-for-purpose:

1. **Section 22(1)(a)**, which enables regulations "prohibiting the sale of a priority product, except in accordance with an accredited scheme". Whether this would impose obligations up the waste hierarchy hinges on the content of the accredited scheme. Current Government policy is that schemes are industry-designed, so obligations would only be those that industry requested for inclusion within the scheme. Also, this power is only available for priority products.
2. **Section 23(1)(b)**, which enables regulations "controlling or prohibiting the manufacture or sale of products that contain specified materials". Whether this provision enables mandates or obligations in relation to how a product could be sold or supplied[8] hinges on the definition of "control", which has not been tested or explored. For greater certainty, it would be advisable to amend this provision (or create a new one) that more expressly permits regulations creating mandates or obligations in relation to the prevention, reduction and reuse of products and materials.
3. **Section 23 (1)(c)**, which enables regulations to require "specified classes of person to provide a take-back service for products, and prescribing requirements for—(i) the take-back service; and (ii) the reuse, recycling, recovery, treatment, or disposal of products taken back". This provision has never been utilised, but could be used to implement an obligation to prioritise reuse over recycling in takeback schemes (in the context of a product stewardship scheme or otherwise), as in the Flanders example in Table 4. The provision could also conceivably be used to support the use of reusable packaging by requiring hospitality and retail outlets to participate in taking back, collecting, and potentially sanitising, reusable packaging and serviceware. NB the provision is limited to an obligation to take-back products and to the phases of activity following takeback. It does not enable other types of mandates or obligations relating to other activities or other parts of product lifecycles.

[8] N.b. that the definition of "sale" in the WMA includes its natural meaning, but also "distribution or delivery, whether or not for valuable consideration", as per s 5 of the Act.

Creating a more permissive enabling power for mandates and obligations

Often mandates are simply written into the primary legislation; the option to do this for certain products and materials could be considered for the waste legislation update. However, there are instances of broadly framed enabling powers that could permit mandates and obligations, so long as the purpose of the mandate aligns with one set out in the power. For example, in the context of mandatory product stewardship, the Australian Recycling and Waste Reduction Act 2020 enables the relevant Minister to make rules that "require one or more specified persons to take, or not to take, specified action in relation to a specified product". Another example is in Part 1 of Schedule 4 on Producer responsibility obligations in the UK Environment Act 2021:

> *General power*
>
> 1(1)The relevant national authority may by regulations make provision for imposing producer responsibility obligations on specified persons in respect of specified products or materials.
>
> (2)The regulations may be made only for the purpose of—
>
> (a) preventing a product or material becoming waste, or reducing the amount of a product or material that becomes waste;
> (b) sustaining a minimum level of, or promoting or securing an increase in, the re-use, redistribution, recovery or recycling of products or materials.
>
> (3)In this Schedule "producer responsibility obligations" means steps required to be taken, in respect of products or materials, for a purpose in sub-paragraph (2).
>
> *Examples of provision that may be made*
>
> 2(1) The regulations may make provision about—
>
> (a) the persons to whom producer responsibility obligations apply;
> (b) the products or materials in relation to which producer responsibility obligations apply;
> (c) the obligations imposed by the regulations.

Theme 3: Targets and target-setting powers

Targets (especially when binding, measurable and timebound) are essential for driving progress up the waste hierarchy. They are also essential for ensuring performance and accountability from product stewardship schemes. Targets also help to articulate higher order goals and ways of understanding and tracking progress towards circularity. For example, reduction and reuse could be pursued through high-level targets to reduce raw material consumption or production, or to increase the offering of particular business models (like sharing, reuse or repair). Quantitative targets might be expressed in relation to weight, numbers of products/units, market share of particular business models, or a proportion of a business' product portfolio or retail space that should be dedicated to particular activities.

The ability to set granular targets based on different layers of the waste hierarchy, or different sectors/products/producers within a product category, is also important for efficacy. For example, reuse targets should be separated from recycling targets; if combined, they are likely to be fulfilled through recycling only (rreuse, 2022, p.1). Furthermore, an overarching reuse target could be set for a product (e.g. packaging), but this could be combined with more specific targets for different sectors and product categories (e.g. retailers, producers, beverage, food, e-commerce etc.), recognising differentiated responsibilities and capacities.

Naturally, any targeting-setting must be accompanied by measures such as plans and strategies that ensure that the target is reached, with actions that start early enough to be effective.

International examples

Internationally, target-setting for top of the waste hierarchy/inner loop activity takes many forms. Targets may be directed at particular products, or at expected reduce and reuse outcomes for materials or products generally. Laws might set targets outright, or require another body to set targets. In the latter case, the resulting target may or may not be binding, and the actor charged with setting the target varies, from national governments, to Producer Responsibility Organisations. Enabling provisions that accord the Government with a target-setting power might be available in relation to any product, or only in the context of a product stewardship scheme.

Table 5: International examples of reduction and reuse targets (or target-setting powers)

Type of target	Examples
General consumption reduction targets (not product-specific)	No binding raw material consumption targets exist yet, globally. But a handful of non-binding targets exist in national policies. For example, the **Circular Dutch Economy programme** aims to halve primary raw material use by 2030, while the **Finnish Strategic Programme to Promote a Circular Economy** states that total consumption of primary raw materials in Finland in 2035 should not exceed 2015 levels. Several jurisdictions have binding targets to reduce waste generation, but as these focus 'downstream', they are an indirect way of reducing upstream consumption. The likely need for consumption reduction targets for key material sectors (set based on 1.5°C aligned carbon budgets)—and the need to assess the policy and regulatory instruments to enable, set and implement them—was recently raised in a report by **Eunomia Research & Consulting** (Hann et al, 2022), which found that limiting global warming to 1.5°C requires real and rapid reductions in raw material consumption.
Product-specific consumption reduction targets	Consumption reduction targets for products appear to be mostly focused on packaging and single-use items. For example, the **Spanish Royal Decree on Packaging and Packaging Waste** has set a target for a 70% reduction in single-use cups and foodware by 2030. **France** has set a national objective to completely phase-out all single-use plastics by 2040 via 5-yearly reduction, reuse and recycling targets that the Government is required to set by decree. The first such "**3R Decree**" in 2021 sets a 20% reduction in single-use plastic packaging by 31 December 2025. The decree also sets a 100% reduction in "unnecessary" single-use plastic packaging by 31 December 2025 (defined as packaging that does not have an essential technical function, such as product protection, health and integrity, transport or regulatory information support). In Article 66 of the **law related to anti-waste and the circular economy**, France has also set a binding target to halve the number of plastic bottles put on the market by 2030.
General reuse targets (not product-specific)	Reuse targets that are not tied to a specific product have been expressed in the Flanders region of Belgium by reference to weight: the **Implementation Plan for Household Waste and Comparable Industrial Waste** sets a per capita reuse target of 7kg of materials each year, to be verified by the region's accredited reuse centres. Reuse is defined as the product going through the reuse/preparing for reuse process and being sold as a secondhand good.
Product specific reuse targets	Several jurisdictions have set binding reusable packaging targets. For example, France's **3R Decree** stipulates that half of the mandatory 20% reduction in single-use packaging by 2025 must be achieved through reusable packaging systems. In **Portugal**, 30% of all packaging must be reusable by 2030. Austria's **Waste Management Act** sets binding reusable packaging quotas for beverages of 25% by 2025, and 30% by 2030, with more specific quotas for different beverage types (e.g. beer, milk, juice etc.).

Type of target	Examples
	Several reusable packaging targets create specific quotas for retailers. For example, Austria's **Waste Management Act** will require ⅓ of each retail chain's company stores to offer returnable beverage packaging by 2024, increasing to 90% by 2025, and 100% by 2026. In **Chile**, at least 30% of beverage bottles displayed at point of sale in supermarkets by 2024 must be reusable bottles. Both **France** and **Spain** have created targets for 20% of supermarket floor space to be dedicated to bulk/unpackaged aisles by 2023 (Spain) and 2030 (France). Binding reuse targets have also been set for products other than packaging, often in the context of EPR. For example, in both **Spain** and **Belgium's Wallonia region**, producers are required to prepare a proportion of WEEE (between 2-4%, across various categories) for reuse. In **France**, by 2030, the weight of re-used and prepared for re-use products (including textiles, furniture and Electric and Electronic Equipment) must equal at least 5% of the weight of municipal waste. This is transposed into specific re-use targets for each category of product covered. Each Producer Responsibility Organisation (PRO) will be responsible for data collection and must set actions that will help reach these targets. In 2017, France's EPR scheme for household and corporate furniture waste already had reuse targets of 1.5% and 5% respectively.
Access to and availability of circular businesses	While voluntary, **Scotland** has a quantified and measurable goal of increasing the number of sharing libraries and repair cafes in the country from 24 to 100 by 2025.
Enabling powers or requirement that reduction or reuse targets set	Section 7 of the Irish **Circular Economy and Miscellaneous Provisions Act 2022** requires the Government to set sector-specific targets in each triannual Circular Economy Strategy, and stipulates that the construction, agriculture, retail, packaging, textiles and electronic equipment sectors must all have targets set for them, as well as any other sectors the Minister considers appropriate. The provision also states that the targets shall include any or all of the following: reductions in material resource consumption and the use of non-recyclable materials; increases in the use of reusable products and materials; increased levels of repair and re-use of products and materials; and improved maintenance and optimised use of goods, products and materials. The targets themselves are not binding on the sectors, but the Act requires the Minister to promote voluntary agreements with the sectors in relation to the targets. The consultation document on a **Circular Economy Bill** for Scotland has proposed inclusion of an enabling power to set statutory targets, via secondary regulations, on consumption reduction, reuse and recycling. The document does not specify whether targets would be product/sector specific, or economy-wide,

Type of target	Examples
	and the proposed Bill is not yet drafted. Schedule 4 of the **UK Environment Act 2021** that enables the government to impose producer responsibility obligations, accords the Government with a regulatory power to set "targets to be achieved in relation to the proportion of products or materials (by weight, volume or otherwise) to be re-used, redistributed, recovered or recycled (either generally or in a specified way)." This power creates a relatively wide scope for how a reuse target might be framed and to whom it might apply, but does not enable targets based on consumption reduction.

The situation in New Zealand

Neither the WMA nor the current Waste Strategy contain targets of any sort, at any layer of the waste hierarchy, binding or otherwise. The WMA also has no target-setting powers, whether for products generally, or in the context of regulated product stewardship schemes. Introducing a target-setting power to the updated waste legislation is recommended. Such a power should be broad enough to enable targets at all levels of the waste hierarchy, and with specific granularity to hone in on sectors, products, producers, retailers, business models etc. (as relevant, depending on context). It should be noted that paragraph (b) of the definition of "reduction" in s 5 of the WMA will also require amending to cover reduction of the product itself (so that reduction targets can go beyond a product's waste generation to include reductions in production/consumption).

Based on overseas examples, it seems appropriate also to consider:

- introducing a broader power to set (or require the setting of) sector-wide or economy-wide statutory targets at all levels of the waste hierarchy.
- including binding targets (for specific products and sectors, or economy-wide) directly in the primary legislation itself (in addition to enabling powers).

Theme 4: Economic instruments

Economic instruments and market-based incentives are powerful tools for the transition to a circular economy because they offer a mechanism for encouraging people and businesses to 'do the right thing', without having to rely only on command and control measures, such as bans or restrictions. Economic instruments can be used to disincentivise linear practices, and incentivise behaviour up the waste hierarchy. They are also important for financing the growth and ongoing operation of reduction and reuse activities. Economic instruments can be applied to the economy as a whole (e.g. through certain fiscal approaches), or they can be implemented in relation to products within or outside the context of a product stewardship scheme.

International examples

Table 6: International examples of economic instruments to incentivise prevention, reduction and reuse

Instrument	Examples
Consumer-facing levies/charges or discounts	Requiring those who dispense particular linear products to the public (such as retailers) to place an extra charge on those products, can help to disincentivise their use, without having to ban them outright. Commonly referenced examples are the Irish plastic bag levy, or a 'latte levy' applied to single-use cups. The latter currently exists in some cities in North America, such as **Vancouver, Canada**, where cafes are required to charge customers a minimum of 25c for disposable cups. A draft regulation that would introduce a charge on disposable cups is currently proposed in **Ireland**. Environmental charges or levies can also be used in tandem with single-use plastic product bans to disincentivise regrettable substitution (e.g. the **Californian plastic bag ban** that also mandates a minimum charge on the supply of bags made of any other material). The levies can further support circular behaviour if they are reinvested in activity up the waste hierarchy. For example, proceeds in **Ireland** from environmental charges will be redirected to a national Circular Economy Fund, which can be allocated to assist, support or promote the production, distribution or sale of less harmful products. The flipside of requiring a charge is to require certain actors to offer customers a discount in certain circumstances. For example, in **Taiwan**, chain beverage stores are required to give a discount of ~20 cents if customers bring their own cup, and **France** requires takeaway beverages in a consumer BYO cup to cost less than those in a single-use cup.

Instrument	Examples
Producer-facing levies	Linear business practices or consumption of certain raw materials can be disincentivised through producer-facing levies, which can be imposed in the context of a product stewardship scheme, or as a standalone tax. For example, **Austria** has recently introduced a new levy on producers and importers of plastic packaging (an average fee of 0.8 EUR per kg of plastic packaging placed on the market). The **UK** has introduced a plastic packaging tax for any plastic packaging that does not contain at least 30% recycled content. **Spain** has a tax on non-reusable plastic packaging, to encourage greater uptake of reusable packaging.
Producer fees to finance or ensure cost recovery for reuse activities	In order for products to be effectively reused at the end of their first life (in the context of product stewardship schemes or otherwise), the costs of reuse activities must be covered, just as they must be for recycling. The French **law related to anti-waste and the circular economy** now earmarks a proportion of producer contributions in several EPR schemes to reuse. For example, 5% of contributions for EPR schemes related to durable goods must go towards a "Solidarity Reuse Fund" that will be used to financially support actors involved in reuse. Meanwhile 2% of EPR contributions from French packaging schemes is to be allocated to exploring opportunities for reusable packaging. France has also created a "repair fund" to subsidise the costs of repairing certain electrical and electronic equipment, which has been generated through a tax on producers via the country's EEE EPR scheme.
Ecomodulation of producer fees to incentivise circular products and business models	Ecomodulation is the concept of charging producers variable fees based on environmental attributes of their product (e.g. higher fees for less recyclable products and lower fees for more recyclable products). Ecomodulation is not the same as variable fees within a scheme to ensure full cost recovery across different categories of the same product. Ecomodulation is about incentivising more ecological product or business model design rather than cost recovery. Ecomodulating fees in the context of EPR are common in Europe and have been utilised most extensively in **France**, which has established a compulsory "bonus-malus" producer fee system for all EPR schemes based on a wide variety of eco-design criteria (such as the quantity of material used, the incorporation of recycled material, the use of renewable resources, durability, repairability, the possibilities of reuse, recyclability, and the absence of ecotoxicity and dangerous substances). A recent briefing document on textile EPR suggested eco-modulation could also be used to drive more circular business models. The briefing suggested fees could modulate downwards based on the number of new items a producer places on the market (fewer items attracting lower fees), or to favour practices such as leasing, repairing and reusing items already on the market (Changing Markets Foundation, Zero Waste Europe & European Environmental Bureau, 2022, p.9).

Instrument	Examples
	Eco-modulation can be a useful tool to incentivise eco-design in appropriate contexts. However, sometimes the environmental objective might be more effectively achieved via other policy tools (Hogg et al, 2020). A recent webinar by Dominic Hogg (formerly Eunomia, now Equanimator) hosted by WasteMINZ (written summary available in Hogg & Blumhardt, 2022) also highlighted that eco-modulation has emerged in Europe due to the nature of the EU-Member State relationship. This relationship creates particular constraints for implementing more direct measures, like eco-taxes, that are not necessarily relevant in the New Zealand context. In the webinar, Hogg suggested that New Zealand has greater freedom to explore other legislative tools for disincentivising environmentally harmful products and business models that might be more effective in some contexts than eco-modulation.
Subsidies & tax incentives for reuse activities and circular business models	Providing subsidies or tax incentives for reuse activities can help to promote these activities vis-a-vis linear business models. In Taiwan, Article 23 of the **Resource Recycling Act** stipulates that awards and grants will be available for reuse initiatives, as well as tax incentives for reuse research and infrastructure. Some cities in **Austria** have committed to reimburse 50% of the labour costs for certain items, up to 100 EUR per household per year, and created funds from which to do this. Furthermore, it is increasingly common for countries to implement reduced GST or to provide a GST rebate on repair services for common household products or consumables (e.g. **Ireland, Luxembourg, Matla, Netherlands, Poland, Slovenia, Finland, Sweden**), or on the sale of used goods by social enterprises or charities (e.g. **France, Belgium, UK**).
Deposit Return Systems (DRS)	Requiring a financial deposit be placed on a product at the time of purchase, which is redeemed upon the product's return, is an economic instrument that helps to lift recovery rates of products and ensure separate collection. Both outcomes increase the possibility of reuse for the targeted product (even though DRS is often used to improve recycling). To date, DRS is most commonly applied for beverage containers (see Wilcox and Mackenzie, 2021), although its application has been recommended for other products, including takeaway packaging for prepared food and drink. DRS is generally considered to be a necessary precondition for effective reuse of packaging, but not sufficient on its own to drive such an outcome and should be combined with other tools in order to favour return for reuse (Blumhardt, 2020; Wilcox and Mackenzie, 2021). Some countries have specifically established (or proposed to establish) their beverage DRS in such a way that reuse is accommodated and supported within the system (e.g. Germany; Lithuania; France; Oregon, USA).

The situation in New Zealand

The wiggle room to implement creative use of economic instruments is currently very narrow in New Zealand waste legislation.

Section 23(1)(e) creates the power to establish deposit return systems, but has never been used. Arguably, establishing a DRS, particularly one designed to drive reuse, requires a broader swathe of regulatory powers to be marshalled in tandem, including target-setting powers and levies, which are not currently available in the WMA. The likelihood that the Government's proposed beverage container return scheme will need to be established via primary legislation demonstrates the restrictive nature of the WMA's current regulatory powers.

Section 23(1)(d) of the WMA creates the power to set:

> …fees payable for the management of a product and specifying—
> (i) the class or classes of person who must pay the fee; and
> (ii) the stages in the life of the product where the fee must be paid; and
> (iii) the purposes to which the fee must be applied:

While this power has not been used, the provision has generally been interpreted narrowly. The restriction on fees being "payable for the management of a product" appears to rule out the possibility of a charge simply to disincentivise use of product. It is unclear whether the restriction also disallows fees being redirected towards financing the growth of reuse activities in relation to the product category generally. The provision also lacks specificity to enable a sophisticated system of eco-modulation. The introduction of a broader set of enabling powers is required to take full advantage of the possibilities presented by economic instruments.

Table 7: Some examples of enabling powers for levies and fees

Power	Example
Enabling power to recover costs for reuse (NB: "disposal" is defined as including "re-use")	**Environment Act 2021 (UK)** SCHEDULE 5 Producer responsibility for disposal costs PART 1 Requirements *General power* 1(1) The relevant national authority may by regulations make provision requiring the payment of sums by specified persons, in respect of specified products or materials.

Power	Example
	(2)The regulations may be made only for the purpose of securing that those involved in manufacturing, processing, distributing or supplying products or materials meet, or contribute to, the disposal costs of the products or materials. *"Disposal costs" and "disposal"* 2(1) In this Schedule the "disposal costs" of products or materials means such costs incurred in connection with the disposal of the products or materials as may be specified in the regulations. (2)In this Schedule the "disposal" of products or materials includes their re-use, redistribution, recovery or recycling. (3)Disposal costs may include the costs of— (a)collecting and transporting products or materials for disposal, (b)sorting and treating products or materials, (c)other steps preparatory to disposal of products or materials, and (d)providing public information about the disposal of products or materials.
Enabling power to create environmental charge	**Circular Economy and Miscellaneous Provisions Act 2022 (Ireland)** **Environmental levy** 11. (1) Subject to subsection (3), the Minister may, with the consent of the Government, make regulations providing that there shall be chargeable, leviable and payable, a levy in this Part referred to as an "environmental levy") in respect of the following: (a) the supply to a customer, in or at such class or classes of retail premises as may be prescribed for the purposes of this section, of any or all of the following: (i) single-use cups; (ii) single-use containers; (iii) single-use packaging; (iv) such class or classes of the single-use items referred to in subparagraphs (i) to (iii) as may be prescribed for the purposes of this section (v) such class or classes of re-usable alternative items as may be prescribed for the purposes of this section; (b) the supply to a customer of plastic bags or such class or classes of plastic bags as the Minister may prescribe for the purposes of this section in or at any or all of the following: (i) a supermarket; (ii) a service station; (iii) such other class or classes of retail premises as may be prescribed for the purposes of this section.

Circular taxation and subsidies

> **"... we must do away with all environmentally harmful subsidies and tax benefits and replace them with a tax treatment favourable to all circular and sustainable activities."**
>
> (Vence and de Jesus Lopez Perez, 2021, p.18)

A growing body of secondary literature is emphasising that the structural nature of most tax systems globally is preserving the linear economy and presenting a major barrier to circularity. For example, most government tax revenue is generated by taxing labour, with environmental or resource taxes generating minor sums. This system suits linear business models, which tend to be resource-intensive, while disadvantaging more labour-intensive circular business models. Without taxes on resource usage, most economies also lack strong incentives to increase resource productivity. This situation is only worsened by widespread subsidies for extractive industries. The secondary sources raising these issues (which include reports by the World Bank (2022) the OECD (2019), and the Ellen MacArthur Foundation (2021), and, in the New Zealand context, the Tax Working Group (2019), Barrett & Makale (2019, and Sustainable Business Network & Grant Thornton New Zealand (2022)) stress the need for fundamental changes to how most countries tax, if a circular economy is to be realised, including:

- Introducing or increasing taxes on raw materials, land and wealth.
- Shifting the tax burden from labour and services to resource usage and material intensive products.
- Changing GST application to enable tax breaks for circular business models, such as repair, PaaS, and utilisation of secondary materials.
- Increasing landfill taxes and implementing further taxes to internalise externalities.
- Allocating tax credits to research and development into new circular products and processes.
- Phasing-out subsidies and tax concessions for extractive and material processing sectors, and increasing subsidies for circular activities.
- Allocating carbon credits for activities that avoid emissions in the first place.

Structural amendments to the tax system may fall outside the scope of waste legislation. However, the Government has set a vision to work towards a circular economy in its first ERP, and this vision is likely also to be central in the new waste strategy. Achieving the vision of a circular economy for Aotearoa, where production and consumption systems are transformed and circular business models become the norm, will require the tax conversation to be opened.

Theme 5: Circular design specifications for products and services

The design of products and services for circularity involves greater emphasis on durability, reusability and repairability, and new forms of product ownership that reduce product over-duplication or under-utilisation in the economy. These features can be referred to as "resource efficiency" because they reduce raw material extraction while getting the most out of any resources that have been extracted and embedded in a product. Designing for circularity also entails the phase-out of hazardous substances in order to 'detoxify' loops and ensure products and materials can circulate safely (Johansson, 2022). Legal obligations are deemed necessary as manufacturers may lack incentives to design more resource efficient, non-toxic products and services, and it is difficult for consumers to create change via purchasing decisions (Maitre-Ekern & Dalhammar, 2016, p.379).

Laws to promote resource efficient design and service provision can be expressed in terms of mandatory requirements and performance standards, and enhanced consumer protections and rights. One area that brings some of these reforms together to achieve a resource efficiency outcome is the **right to repair**. Design specifications for resource efficiency can also overlap with bans and mandates. For example, the criminalisation of planned obsolescence effectively outlaws intentionally resource inefficient product design, while bans on the use of disposable items effectively requires durability for certain product categories. Design specifications also overlap with labelling and transparency when measures to promote resource efficiency involve on-product information provision to consumers on matters such as repairability and durability.

To date, product design standards have more commonly been applied to energy efficiency during the product use-phase. However, full life-cycle resource efficiency requirements and controls on hazardous substances are now underway in several jurisdictions, including a European Commission proposal to substantially reframe the Eco-Design Directive (see Table 9). Challenges to date have related to:

- Developing practical, applicable definitions of key concepts like repairability, or demonstrating producer intention regarding planned obsolescence.
- The complexity and time involved in determining appropriate, product-specific resource efficiency requirements given (ever-increasing) product diversity. So far, the resource efficiency requirements that exist globally are applied only to a small range of products (e.g. vacuum cleaners, whiteware, some small electronics).

- The lack of comprehensive regulator visibility over product and material content to enable adequate control over the use of hazardous substances.
- The necessity of reform across many areas of law in order to achieve effective resource efficiency—including waste and product stewardship, intellectual property, consumer protection, and hazardous substances—and the need to balance the objectives of such reforms with each other, and with international trade obligations.
- Striking the right balance between controlling product design for circularity and safety, and maintaining industry freedom to innovate and create functional products.

International examples

Internationally, legislative design standards for resource efficient product design can take either a framework approach—whereby comprehensive delegated powers are created to enable more detailed regulation within product categories—or a direct regulation approach targeting particular facets of resource efficiency. The latter includes measures such as specifications on warranties; product durability standards; design features for repairability; focused right to repair provisions, such as requiring access to spare parts for a set period of time; or regulations on product design to mitigate pollution emissions and releases, such as microplastics. Framework legislation is currently the prevalent approach, which leaves some degree of uncertainty surrounding what specific resource efficiency requirements might look like in practice, as well as the method for effective monitoring and enforcement.

Table 8: Some examples of direct regulations on specific product design features

Design specification	Example
Establishing minimum warranties and guarantees for products	Warranties and guarantees oblige producers to ensure a minimum level of product durability, and accord consumers with the right to expect durability. Warranties and guarantees are often set as a blanket time period across product categories. For example, under the **EU Sale of Goods Directive**, products are expected to perform their intended function for up to 2 years after market placement, otherwise producers must either repair or replace the faulty product for the consumer, free of charge. **France** has extended this provision under the **law related to anti-waste and the circular economy**, stipulating that the consumer receives an additional 6 months warranty, on top of the 2 years, if the product is repaired. In **Finland**, the **Consumer Protection Act Amendment** establishes product warranties based on the expected lifespan of products within the relevant category, rather than a set number of years.

Design specification	Example
Setting product durability standards	Certain products must, by definition, be durable, and regulations can be used to set minimum standards to avoid greenwashing. For example, reusable packaging must be able to withstand multiple reuse cycles of filling, transportation and washing. Some jurisdictions that are requiring uptake of reusable packaging have legislated definitions of reuse that incorporate quantitative design standards. For example, in the USA, the **Sustainable Packaging for the State of California Act of 2018** defines reusables as items that maintain their "shape, structure, and function after 780 cycles in a cleaning and sanitizing process" or that carry a manufacturer's warranty of at least 1 year of service.
Requiring design for durability, reuse and repair	Some jurisdictions have created producer obligations to design products to increase lifespan and ease of repair and reuse (for example, ensuring easy disassembly). **Article R543-176 of France's Environmental Code** requires electrical and electronic equipment to be "designed and manufactured in such a way as to facilitate its reuse, repair, dismantling and recovery", including easy removal of batteries and accumulators. The **Spanish Royal Decree (No 110/2015) on waste and electrical and electronic equipment** similarly requires producers to design these products to extend their useful life by facilitating reuse, disassembly and repair, and prohibits producers from preventing reuse of electrical and electronic equipment through specific design features or manufacturing processes. In Taiwan, Article 9 of the **Resource Recycling Act 2009** makes manufacturers of goods and containers responsible for increasing the useable lifespan of these products and implementing repair and maintenance for them. The **2019 regulations updating the EU Ecodesign Directive** now require certain products (e.g. whiteware) to be designed so that spare parts are replaceable with the use of commonly available tools and without permanent damage to the appliance. On the whole, legislation requiring design for durability and repairability has thus far avoided overt prescription, giving companies freedom to innovate. However, lack of specificity could potentially create enforcement issues, e.g. difficulty in proving when producers have not done enough to discharge their responsibility or intentionally prevented reuse through design.
Requiring access to spare parts and repair information	The rise of the 'Right to Repair' movement has led several jurisdictions to explore and implement laws requiring producers to make spare parts readily accessible and affordable, and to share information necessary for repair, such as diagnostic manuals, with independent repairers or consumers. The **2019 regulations updating the EU Ecodesign Directive** created world-leading right to repair requirements for a set number of electronic and electrical products (e.g. whiteware, electronic displays and lamps). These include requiring availability of spare parts for a certain number of years following the product's placement on the market, and ensuring professional repairers can access product repair and maintenance information. In New York, **Senate Bill S4104A (Digital Fair**

Design specification	Example
	Repair Act) is currently **proposed**, which would require producers of electronic equipment to make instructions, parts and tools for repair available. In France, the **law related to anti-waste and the circular economy** takes the obligation to provide spare parts one step further, stipulating that, if spare parts are no longer available on the market, the manufacturer or importer must, subject to respect for intellectual property rights, provide professional vendors or repairers with the drawing for manufacturing the spare part via 3D printing. In Spain, the **Royal Decree 110/2015 of 25 February on Wastes of Electric and Electronic Equipments** requires producers of electronic equipment to provide repair and preparation-for-reuse information to reuse centres, specifically.
Packaging requirements	Design specifications for packaging that are targeted at improving recycling or reducing the likelihood of pollution are not uncommon. For example, laws relating to minimum recycled content in packaging, the **EU Single-Use Plastics Directive** mandating the use of tethered caps on PET bottles from 2024, or the requirements surrounding material use and design for plastic bottles in order to participate in the Norwegian beverage deposit return scheme. In terms of packaging requirements focused higher up the waste hierarchy (e.g. prevention, reduction and reuse), Article 14 of Taiwan's **Resource Recycling Act** requires all producers to avoid excessive packaging of their products, and also creates delegated power to restrict or prescribe packaging for specified products made, sold or imported into Taiwan.
Requirements to incorporate design features that avoid pollution or toxicity/ substances of concern	Product design specifications that restrict use of toxic substances can help to ensure safe circulation of products and materials in a circular economy (Alaranta & Turunen, 202, pp.126-127). Laws relating to the use of harmful or potentially harmful substances in products often concern transparency around these contents, but some regulators have intervened to set limits or require certain substances not be used (such requirements overlap with powers and provisions discussed under Bans and Restrictions). In Maine, USA, PFAS cannot be added to any new carpets, rugs or fabric treatments to be sold or distributed in the state. Some jurisdictions are also exploring or implementing design specifications to mitigate releases of pollutants, such as microplastics. For example, France's **law related to anti-waste and the circular economy** requires all clothes washing machines to have a plastic microfibre filter. The EU is currently developing regulations that will establish a pathway to setting tyre abrasion limits to reduce microplastic shedding from tyres while they are in use.

Table 9: Some notable examples of framework approaches for resource efficient design

Example	Description
Title: Proposed Eco-design for Sustainable Products Regulation (EU) - Proposal for a regulation of the European Parliament and of the Council establishing a framework for setting ecodesign requirements for sustainable products and repealing Directive 2009/125/EC **Jurisdiction:** European Union	The **proposed** update to the EU Ecodesign Directive would create **a framework for establishing ecodesign requirements, covering a wide array of resource efficiency requirements.** The framework would capture virtually all products placed on the European market. The ecodesign requirements would be set in relation to product categories by the European Commission via delegated acts. They would include product **performance requirements** and **information requirements**, both of which would be based on specified **product parameters** set out in Annex I of the proposed regulation (reproduced in full, below). The product parameters are essentially indicators of resource and energy efficiency, pollution, and sustainability generally. **Performance requirements** can be in the nature of quantitative requirements (e.g. minimum or maximum levels), non-quantitative requirements, or requirements related to a product's functional performance. **Information requirements** would include new digital passport requirements, disclosures to enable tracking of all substances of concern through product lifecycles (including substance name, location, concentration, instructions for safe use of the product and information relevant for disassembly). Additionally, products should be accompanied by information detailing performance in relation to the specified product parameters, as well as information on how to install, use, maintain and repair the product, information for treatment facilities on disassembly, recycling or disposal of the product, and other information that may influence how parties other than the manufacturer handle the product. "ANNEX 1 <u>Product parameters</u> The following parameters may, as appropriate, and where necessary supplemented by others, be used as a basis for improving the product aspects referred to in Article 5(1): (a) durability and reliability of the product or its components as expressed through the product's guaranteed lifetime, technical lifetime, mean time between failures, indication of real use information on the product, resistance to stresses or ageing mechanisms; (b) ease of repair and maintenance as expressed through: characteristics, availability and delivery time of spare parts, modularity, compatibility with commonly available spare parts, availability of repair and maintenance instructions, number of materials and components used, use of standard

Example	Description
	components, use of component and material coding standards for the identification of components and materials, number and complexity of processes and tools needed, ease of non-destructive disassembly and re-assembly, conditions for access to product data, conditions for access to or use of hardware and software needed; (c) ease of upgrading, re-use, remanufacturing and refurbishment as expressed through: number of materials and components used, use of standard components, use of component and material coding standards for the identification of components and materials, number and complexity of processes and tools needed, ease of nondestructive disassembly and re-assembly, conditions for access to product data, conditions for access to or use of hardware and software needed, conditions of access to test protocols or not commonly available testing equipment, availability of guarantees specific to remanufactured or refurbished products, conditions for access to or use of technologies protected by intellectual property rights, modularity; (d) ease and quality of recycling as expressed through: use of easily recyclable materials, safe, easy and non-destructive access to recyclable components and materials or components and materials containing hazardous substances, material composition and homogeneity, possibility for high-purity sorting, number of materials and components used, use of standard components, use of component and material coding standards for the identification of components and materials, number and complexity of processes and tools needed, ease of non-destructive disassembly and re-assembly, conditions for access to product data, conditions for access to or use of hardware and software needed; (e) avoidance of technical solutions detrimental to re-use, upgrading, repair, maintenance, refurbishment, remanufacturing and recycling of products and components; (f) use of substances, on their own, as constituents of substances or in mixtures, during the production process of products, or leading to their presence in products, including once these products become waste; (g) consumption of energy, water and other resources in one or more life cycle stages of the product, including the effect of physical factors or software and firmware updates on product efficiency and including the impact on deforestation; (h) use or content of recycled materials; (i) weight and volume of the product and its packaging, and the product-to-packaging ratio; (j) incorporation of used components

Example	Description
	(k) quantity, characteristics and availability of consumables needed for proper use and maintenance; (l) the environmental footprint of the product, expressed as a quantification, in accordance with the applicable delegated act, of a product's life cycle environmental impacts, whether in relation to one or more environmental impact categories or an aggregated set of impact categories; (m) the carbon footprint of the product; (n) microplastic release; (o) emissions to air, water or soil released in one or more life cycle stages of the product; (p) amounts of waste generated, including plastic waste and packaging waste and their ease of re-use, and amounts of hazardous waste generated; (q) conditions for use."
Title: Recycling and Waste Reduction Act **Provision:** s 92 **Jurisdiction:** Australia	Section 92 of the Australian Recycling and Waste Reduction Act creates the power to make rules, in the context of a mandatory product stewardship scheme to specify requirements in relation to "the durability, reparability and reusability of the product" and to "product design for the product".
Title: Environment Act (UK) 2021 **Provision:** Schedule 7 **Jurisdiction:** UK	Schedule 7 of the UK Environment Act creates a regulatory power to require specified products, in specified circumstances, to meet specified resource efficiency requirements. The Act defines such requirements as those that relate to the product's impact on the natural environment and design for durability, upgradeability, the ability to repair, remanufacture or maintain the product, the availability of spare parts and necessary tools for repair, the materials or techniques used to manufacture the product, resource consumption during production and use, and pollutants released or emitted during the product's production, use or disposal (including, but not limited to, GHGs). "SCHEDULE 7 Resource efficiency requirements PART 1 Requirements *General power*

Example	Description
	1(1)The relevant national authority may by regulations make provision for the purposes of requiring specified products, in specified circumstances, to meet specified resource efficiency requirements. ... *Meaning of "resource efficiency requirements"* 2(1)"Resource efficiency requirements", in relation to a product, means requirements which— (a)are within sub-paragraph (2) or (3), and (b)are relevant to the product's impact on the natural environment. (2)The requirements within this sub-paragraph are requirements relating to— (a)aspects of the product's design which affect its expected life; (b)the availability or cost of component parts, tools, or anything else required to repair or maintain the product; (c)whether the product can be upgraded, and the availability or cost of upgrades; (d)any other matter relevant to repairing, maintaining, remanufacturing or otherwise prolonging the expected life of, the product; (e)the ways in which the product can be disposed of at the end of its life (including whether and to what extent it can be recycled, and whether materials used in it can be extracted and reused or recycled). (3)The requirements within this sub-paragraph are requirements relating to— (a)the materials from which the product is manufactured; (b)the techniques used in its manufacture; (c)the resources consumed during its production or use; (d)the pollutants (including greenhouse gases within the meaning of section 92 of the Climate Change Act 2008) released or emitted at any stage of the product's production, use or disposal. (4)Resource efficiency requirements may be specified by reference to standards prepared by a specified person."

The situation in New Zealand

The WMA creates very few opportunities to specify design features for products and services. This is particularly problematic given the development of mandatory product stewardship schemes for products like plastic packaging and electrical and electronic products, for which resource efficiency expectations are increasingly being set by Governments overseas. Introducing framework powers in the WMA to establish resource efficiency requirements will be critical for driving new business models across products generally, and for setting design expectations within product stewardship schemes, specifically.

Other pieces of New Zealand legislation allow for some resource efficiency regulations and protections, e.g. the Consumer Guarantees Act 1993 (CGA). However, these laws fall short in terms of effectively driving product redesign for durability and repairability due to lack of clarity, loopholes, inaccessible enforcement mechanisms, and conflicting rights across different areas of law, e.g. consumer law, contract law, and intellectual property law (Austin et al, 2022; Zaw, 2022a; Zaw, 2022b). Addressing these problems will be necessary to ensure the efficacy of any resource efficiency requirements/circular design specifications established under the WMA. For example, in relation to the right to repair, Zaw (2022b) suggests the following amendments to the CGA, Copyright Act, Patents Act and Trade Marks Act:

- Establish a minimum lifetime of products under the CGA to provide greater clarity around the current warranty of "acceptable quality" in s 6 of the Act.
- Mandate that manufacturers make spare parts accessible to consumers or third parties for a set minimum period, and repeal s 42 of the CGA (which currently allows manufacturers to escape their obligations to provide spare parts if they take reasonable actions to notify purchasers about the unavailability of spare parts or repair facilities at the point of the sale). Manufacturer use of proprietary parts could also be restricted.
- Create mandatory requirements for manufacturers to provide diagnostic or repair documentation to consumers and third parties.
- Amend the Copyright Act to allow circumvention of Technological Protection Mechanisms (by product owners or third parties) for repair.
- Introduce a new fair use exception on copyright protection of repair information into the Copyright Act to allow consumers and third parties to share and access information for repair purposes without infringing copyright.
- Amend the Copyright Act to allow copying or adapting computer programs for repair purposes, and to make clear that copyright holders cannot contract out of exceptions to copyright infringements, such as repair.
- Amend the Patents Act, Copyright Act and Trade Mark Act to remove the ability for manufacturers to assert exclusive rights over the replacement parts they produce.

As evident from the examples in Table 9, resource efficiency framework requirements are increasingly including provisions that will empower specifications relating to harmful substances and polluting emissions (including, but not limited to, GHG emissions). New Zealand's hazardous substances regime is not advanced compared to many other jurisdictions and is currently very siloed from other regimes that relate to the circular economy, such as product stewardship and waste legislation. Further research is required to understand the legal reform opportunities in New Zealand that would enable hazardous substances to be better regulated throughout product lifecycles, as this is likely to support more effective product resource efficiency requirements in relation to detoxification.

Theme 6: Resource recovery standards for reuse

The resource recovery sector is critical for keeping products and materials in circulation. Furthermore, as product stewardship schemes increase, producers and retailers may find themselves taking on greater resource recovery responsibilities. Statutory expectations around resource recovery service delivery will likely be needed to ensure best practice and accountability. This also offers an opportunity to set expectations that resource recovery will be undertaken for reuse, not just recycling. Greater regulation and transparency around the material and substance components of products will also support worker and consumer safety when undertaking reuse activities in the resource recovery phase, e.g. undertaking repair activity or deciding whether to resell certain products as secondhand goods.

International examples

Internationally, resource recovery standards that support the reuse of captured materials typically start with mandating separate collections. Following which, it is possible to specify where collected materials should be directed—for example, allocating priority or first right of refusal to reuse organisations. Additional standards around activities such as storage and transportation can help to protect goods from damage that would compromise their reuse. Resource recovery for reuse standards work well in tandem with reuse targets, and financing mechanisms that cover the cost of resource recovery across the waste hierarchy, so that reuse activities are economically viable and workers in the reuse sector are properly remunerated.

Table 10: Some examples of legislated resource recovery standards for reuse

Measure	Examples
Requiring separate collection for reuse	**The Finnish law on textile waste separate collection and implementation pilots** requires municipalities to establish regional collection points for separate collection of used textiles by January 2023, with as much of the collected textiles as possible prepared for reuse and recycling (with reuse given priority). In Flanders (Belgium) the **Solid Waste Management Plan** requires municipalities to establish returns and sorting infrastructure/systems for bulky household waste, to separate reusable items and deliver these to reuse centres. The Spanish **Waste Management Plan** gives social enterprises handling second-hand goods first priority to access resources at municipal waste collection sites.
Setting resource recovery for reuse mandates	Article 15 of Taiwan's **Resource Recycling Act** empowers the government to create reuse mandates for certain items and prescribe how they should be recovered for reuse (e.g. collection, transport, storage methods, facility standards, reuse standards etc.)

Measure	Examples
Requiring producers in EPR schemes to support reuse and repair networks	Article l541-10 of the **French Environmental Code** requires producers of products that generate waste to support reuse and repair networks.

The situation in New Zealand

Section 23 of the WMA contains regulatory powers to prescribe requirements and quality standards for resource recovery activities. Section 23(1)(c) provides the ability to prescribe requirements for reuse of products that are subject to a take-back obligation. Meanwhile, s 23(1)(g) provides a power to prescribe standards to be met when reusing a product or material that has become waste. These powers could foreseeably enable regulations that require reuse to be prioritised by any actors engaging in resource recovery. However, because these powers have never been utilised, their scope remains relatively untested. It is also unclear whether or not the requirements can be accompanied by quantitative targets that would enable compliance to be effectively monitored and enforced.

Theme 7: Requiring transparency in relation to products and materials

Increased transparency about products and their contents gives regulators greater visibility over problematic materials and practices, enabling the development of laws that are fit for the purpose of designing out waste and pollution. Increased transparency also supports, protects and better informs consumers, empowering them to choose circular products and protect their health. Ultimately, Governments cannot manage what they cannot measure, and to measure problems such as chemical safety or raw material consumption, data is needed. Furthermore, without open information about products' environmental credentials, consumers are unable to send market signals to producers, and are more vulnerable to misleading eco claims.

International examples

Overseas analysis demonstrates that regulatory powers to increase transparency in relation to products and materials (with reference to the inner loops of circularity) can include: measures that require industry to disclose production, consumption and waste patterns and the chemical make-up of their products; labelling and signage laws that provide key information to consumers and regulate greenwash; and mandatory participation in digital passport systems and other databases that enable products and substances to be tracked, measured and, if necessary, regulated over time.

Table 11: Some examples of labelling, information and transparency for prevention and reduction of raw material consumption and toxicity, and the promotion of CBMs

Measure	Examples
Tracking and communicating about product contents, including substances of concern	Legal obligations to disclose a product's 'ingredient' list can support regulators to regain oversight of product and material safety. To date, disclosure obligations regarding product contents have tended to focus on specified substances of concern, as opposed to transparency about full product contents. This can be limiting because there are many substances that may be included in products where the safety profile is not known. The **Californian Safe Drinking Water and Toxic Enforcement Act of 1986** (colloquially known as "**Proposition 65**") requires the State to publish a regularly updated list of chemicals that are known to cause cancer, birth defects or other reproductive harm. The Act also requires businesses to label

Measure	Examples
	products containing one or more listed chemicals with a warning that the product may expose the consumer to chemicals that cause cancer, birth defects or other reproductive harm. In the EU, the **REACH Regulation** obliges suppliers of articles to provide information disclosing the presence of particular substances of concern in those articles. The newly updated **Waste Framework Directive** now requires all suppliers of articles containing any substances of very high concern (more than 0.1% by weight) to supply this information to the **European Chemicals Agency** to be placed on a database of hazardous substances in products and materials (established in 2020). The database is accessible to waste treatment operators and consumers on request. In the State of Maine in the USA, manufacturers must disclose if a product they wish to sell in the State contains intentionally-added PFAS, and to provide specific information about the purpose for the addition and the amount. In France, Article 13 and 14 of the **law related to anti-waste and the circular economy** obliges producers and importers to make available to the public information on whether a product contains hazardous substances, as well as substances with confirmed or suspected endocrine-disrupting properties. The proposed update of the **EU Ecodesign Directive** would create a framework for setting information requirements for all products placed on the European market, including requirements to enable tracking of all substances of concern throughout the life cycle of products. Producers would be required to provide information about the name, location and concentration of all substances of concern present in the product (see Table 9).
Communicating about durability, repairability and reusability	In January 2021, **France** introduced a repairability index for a handful of products (including smartphones, laptops, washing machines and televisions), based on a score out of 10 for repairability. This score must be affixed on the product or product packaging at the point of sale. France is also working towards a durability index, which would operate in the same way. As part of its existing EPR schemes, France has also introduced a bonus-malus eco-modulating system for EPR fees that requires payment of differential fees based on the product's resource efficiency. The bonus-malus applied must be clearly displayed on the product itself, acting as a sustainability score to inform consumers about the product's environmental credentials. Schedule 6 of the **UK Environment Act 2021** creates the regulatory power to require producers and other economic operators to provide information about the resource efficiency of specified products, including durability, repairability and upgradeability. Similarly, the proposed update of the **EU Ecodesign Directive** would create a framework for setting information requirements for all products placed on the European market. This would include requirements

Measure	Examples
	to provide information on product performance on resource efficiency factors, such as durability, repairability and reusability (i.e. the product parameters set out in Annex I, reproduced in Table 9, above). Jurisdictions seeking to promote uptake of reusable packaging are increasingly requiring producers and retailers to adopt labelling and signage that raises consumer awareness of the availability of, and/or possibility of using, reusable packaging. In **Austria**, the **Waste Management Act 2020** requires beverage containers to be clearly labelled as either single-use or reusable at the point of sale. In Germany, the **German Packaging Act**, which requires all retail outlets to offer a reusable container option if they sell prepared food and drink to takeaway, obliges those outlets to inform customers about reusable packaging, including information boards and signs that refer to the reusable offer (or clearly visible information online in the case of online ordering platforms). Similarly, in Chile, the **Plastics Reduction Law 21368** that requires supermarkets and beverage vendors to offer a minimum proportion of beverages in reusable packaging, requires those stores to provide information and signage communicating that they sell beverages in reusables, and about the importance of consumers returning reusable bottles.
Public reporting of production, consumption and waste generation	Schedule 6 of the **UK Environment Act** creates the regulatory power to require producers and other economic operators to provide information about the resource efficiency of specified products, which includes sharing information about the resources consumed during the production and use of the product, and any pollutants released or emitted at any stage of its production, use and disposal. Scotland's **proposed Circular Economy Bill** would give Scottish Ministers the power to require producers and businesses to publicly report on unwanted surplus stock and waste. The **proposed update of the EU Ecodesign Directive** would require any economic operator that discards unsold consumer products to disclose publicly (e.g. via a freely accessible website) the number of such products discarded per year, the reasons for the discarding, and how they were discarded.
Regulating ecological claims	In its **law related to anti-waste and the circular economy**, France has prohibited the use of the word "biodegradable" on products and packaging.

The situation in New Zealand

Section 23(1)(f) of the WMA enables regulations "prescribing requirements for the labelling of a product". The provision does not specify what the labelling should be for, but would presumably enable some of the requirements outlined in Table 11. However, it is doubtful that the provision enables the Government to require widespread product disclosure information

via labels, and it does not cover requirements to share information via mediums other than a product label.

Section 23(1)(i) creates a power to require the collection and provision of information, but only in relation to requirements imposed by regulations made under other paragraphs of s 23(1). Potentially, disclosure requirements could be imposed under s 23(1)(b), which allows regulations to be made for the purpose of "controlling" the manufacture or sale of products that contain specified materials. However, this turns on the definition of "control", which has not been tested. Furthermore, the scope of products captured is limited by the classification that they "contain specified materials".

Other disclosure or information provision requirements in the WMA are focused on resource recovery and disposal operations, rather than on the production, sale and use phases of product lifecycles.

As noted elsewhere in this briefing, effective monitoring and control of hazardous substances for the purposes of detoxifying product loops is likely to require substantive reform of New Zealand's chemical safety and hazardous substances regime, combined with its integration into the wider circular economy mission. Further research in this area is recommended.

6

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