

# Regulated Product Stewardship for Textiles in Aotearoa New Zealand

A Cost Benefit Analysis (CBA)

Published June 2026



## Report For

The Textiles Advisory Group (TAG)

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# Executive Summary

## Purpose and Context

This report assesses the feasibility and impacts of introducing a regulated product stewardship (RPS) scheme for textiles in Aotearoa New Zealand. The study uses a cost-benefit analysis (CBA) approach to evaluate economic, environmental, and social outcomes compared to the current “business-as-usual” scenario and two RPS implementation scenarios - low ambition and high ambition.

Globally, textiles are under increasing scrutiny due to their significant environmental footprint and social challenges. The EU’s Strategy for Sustainable and Circular Textiles, and the revised Waste Framework Directive, mandate all EU Member States to establish their own extended producer responsibility (EPR) for textiles and footwear by 2028. The strategy and mandate influence international trade and set a precedent for circular economy practices. While Aotearoa New Zealand operates some voluntary and regulated stewardship schemes, it lacks formal sustainability requirements for textiles.

## What a Regulated Product Stewardship (RPS) Scheme Offers

RPS schemes shift end-of-life costs from taxpayers to producers, incentivising better design and funding circular systems. Obligated parties would include brand owners, importers, and online platforms. Fees would be eco-modulated to reward durability and reparability, aligning with best practice.

Complementary measures, such as eco-design standards, repair incentives, and recycled content targets, are essential to maximise the impact of the RPS scheme. Moreover, embedding mātauranga Māori knowledge) and kotahitanga (guardianship) would add cultural, social, and economic benefits; including support for revitalisation of indigenous fibres and equitable participation in the resultant economic opportunities.

## Scenarios Modelled

Two scenarios were assessed alongside the baseline or business-as-usual scenario of no RPS scheme:

- Low Ambition: Modest targets, drop-off collection points, basic communications, and reuse schemes.
- High Ambition: Ambitious targets, kerbside collection, advanced communications, reuse and repair schemes/support, research and development funding and digital product passports.

Both scenarios cover infrastructure, operational costs, and compliance; with high ambition funding broader innovation and market development.

The product scope and obligated parties remain consistent across the two scenarios.

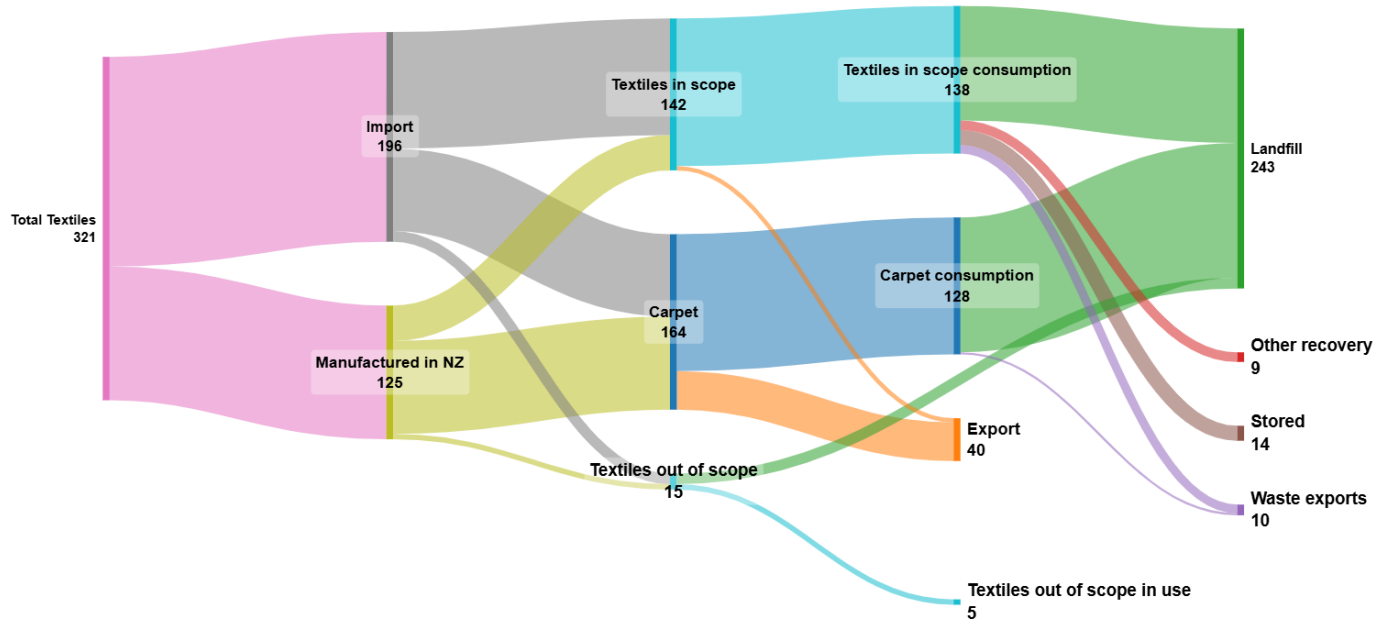
The products in scope for both scenarios are as follows:

## Product scope

Items	
Includes	Clothing textiles (household and corporate), household linens, and corporate textiles (e.g. hotel/restaurant fabrics uniforms etc).
Excluded	Duvets, mattresses, pillows, curtains, carpet, footwear.

The overall estimated flow of textiles in the economy is shown as such:

## Indicative Flow of Textiles in the NZ Economy ('000 tonnes) – Eunomia Analysis



### Key Findings

The modelling shows that introducing an RPS scheme for textiles in Aotearoa New Zealand delivers net economic value through avoided waste management and resource recovery costs, avoided carbon costs, and job creation, although it does introduce new compliance and funding costs for producers in accordance with the polluter pays principle. Overall, an RPS scheme should result in a **net benefit** of \$98M for the low ambition scenario, and \$602M for the high ambition scenario. In addition to the economic benefits, an RPS would significantly improve environmental outcomes, reduce waste and create new economic opportunities and jobs. Although it comes with notable costs for producers and some price increases for consumers, there is a corresponding significant reduction for those currently bearing the costs of managing waste textiles; with territorial authorities in particular seeing a reduction in costs.

The table below summarises key outcomes from the scenario modelling.

### Summary of Costs (Red) and Benefits (Yellow) (all at 2038)

	Baseline	Low ambition scenario	High ambition scenario
Net <b>benefit</b> compared to baseline	NA	\$98M	\$602M
RPS fee level (\$/t) (paid by obligated producers, and assumed to be partially passed through to consumers)	N/A	\$1,555.97	\$2,712.85

Price increase for consumers (excluding super-fast fashion)	N/A	1.8%	2.9%
Price increase for consumers (super-fast fashion)	N/A	7.1%	11.4%
Total waste management and resource recovery costs (with costs shifting from TAs and householders to producers) (\$)	\$187 mil	\$213 mil (+14%)	\$262 mil (+40%)
Textile consumption (t)	156,481	134,119 (-14%)	119,982 (-23%)
Textiles reused or recycled (%)	6%	49% (+43%)	86% (+80%)
GHG emissions (t)	5,095,911	4,271,354 (-16%)	3,734,768 (-27%)
Water consumption (m <sup>3</sup> )	1,807,215,068	1,549,417,248 (-14%)	1,386,323,377 (-23%)
Number of jobs <sup>1</sup>	2,849	2,889 (+1%)	3,012 (+6%)
Revenue from recycled textile sales	N/A	\$1,031mil	\$1,561 mil
Waste and resource recovery cost savings to TAs and ratepayers	N/A	<b>\$11,947,443</b>	<b>\$66,057,246</b>

Note: the introduction of regulated product stewardship fees largely represents the shift of cost for waste management and resource recovery from the end of the lifecycle (TAs, householders) to the start (producers, importers).

Under the baseline scenario, textile consumption is projected to grow steadily, with approximately 138,000 tonnes consumed annually in 2025 and 78% of this material ending up in landfill. Current reuse and recycling rates remain extremely low at around 6%, and only 1% of textiles are recycled domestically. This linear model imposes high environmental costs, including greenhouse gas emissions exceeding five million tonnes and water consumption of 1.8 billion cubic metres annually.

Both RPS scenarios (low ambition and high ambition) deliver substantial materials management improvements compared to the baseline. By 2038, textile consumption falls by 14% under the low ambition scenario and by 23% under the high ambition scenario. This reduction is driven by price signals and supporting measures such as repair schemes and consumer education. Reuse and recycling rates rise dramatically, reaching 49% in the low ambition scenario and 86% in the high ambition scenario. These changes result in significant environmental benefits; greenhouse gas emissions decline by 16% and 27% respectively, while water use falls by 14% and 23%.

RPS fees are estimated at \$1,556 per tonne for the low ambition scenario and \$2,713 per tonne for the high ambition scenario. These costs are largely borne by producers, in line with the polluter pays

<sup>1</sup> Includes textile manufacturing and waste collection and management. Excludes fibre production and retail.

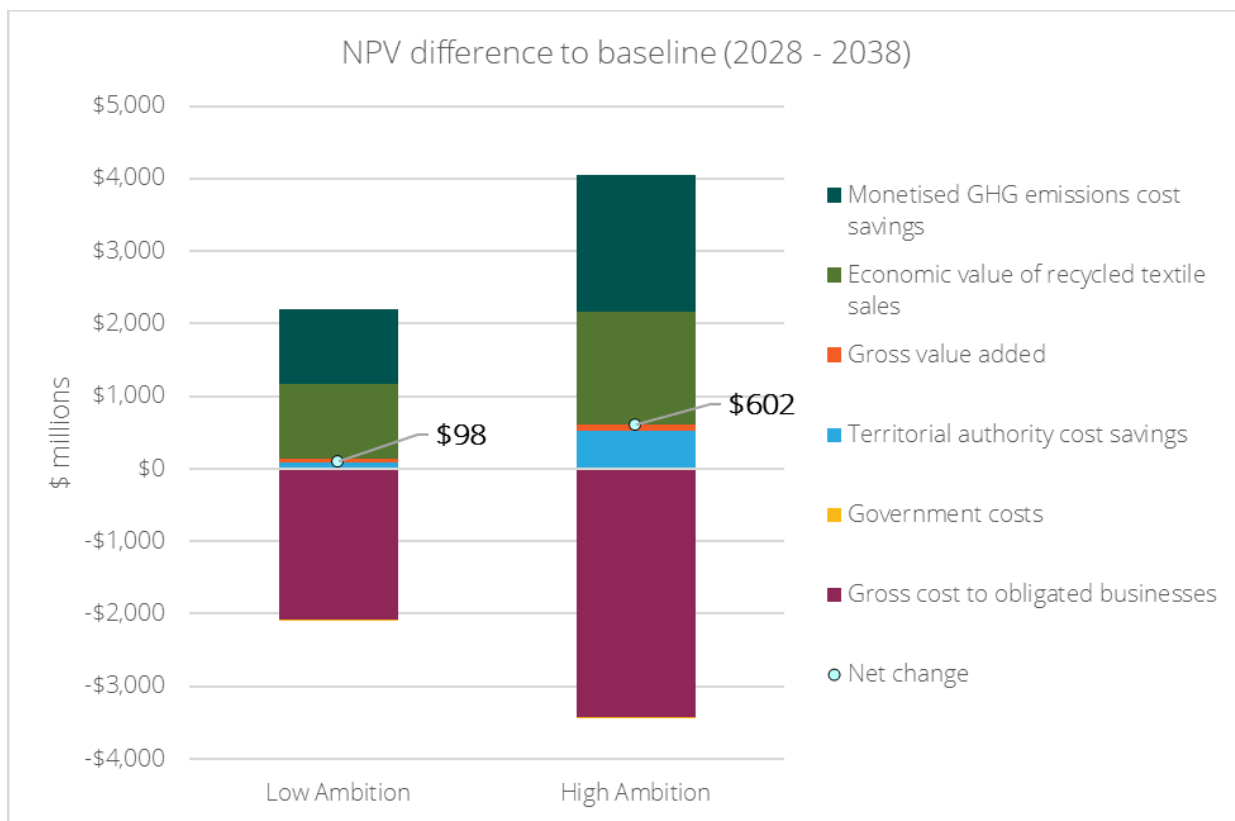
principle, but approximately half is expected to be passed on to consumers. On this basis, for regular textiles, retail prices increase by 1.8% under the low ambition scenario and 2.9% under the high ambition scenario. For super-fast fashion increases are steeper; 7.1% and 11.4% respectively. Eco-modulation of fees is also likely to have a greater impact on super-fast fashion than regular fashion (which is likely to be less durable and recyclable for example), increasing the costs of fast fashion further. This fast fashion market is also more price sensitive than regular fashion, and so these changes should create a strong disincentive for low-quality, short-lived products.

Conversely, the increased income from recycling and reprocessing the recovered textiles into products could reach just over \$1B in the low ambition scenario and up to \$1.56B in the high ambition scenario. These material revenue streams are normally taken into account in terms of the net charges paid by obligated businesses, thereby cutting the gross cost roughly in half. As noted above, a significant proportion of the business costs will also be passed on to the end consumer, leaving businesses with a much lower figure than the gross figure indicated.

While an RPS introduces additional costs to producers, both scenarios project an overall net economic benefit; with local authorities and households experiencing significant savings as waste management and resource recovery costs shift from taxpayers to producers and, to a lesser extent, consumers. This shift to the 'polluter-pays principle' also comes with wider environmental benefits, with carbon reduction benefits alone valued at \$900 million under the low ambition scenario and \$1.6 billion under the high ambition scenario over the 2028–2038 period. Employment also grows modestly, with an increase of 1% under the low ambition scenario and 6% under the high ambition scenario, primarily in circular economy sectors such as reuse, recycling, and repair. Supplementing an RPS with complementary measures such as eco-modulation, cooperative governance, and carefully planned investment into reuse, repair, collection and infrastructure will ensure benefits are felt widely across householders, SMEs, government, and Māori.

Figure E-1 presents the net present value (NPV) difference compared to the baseline over the 2028–2038 period. Presenting outcomes as NPV enables future financial implications to be valued in today's terms, providing ease of comparison.

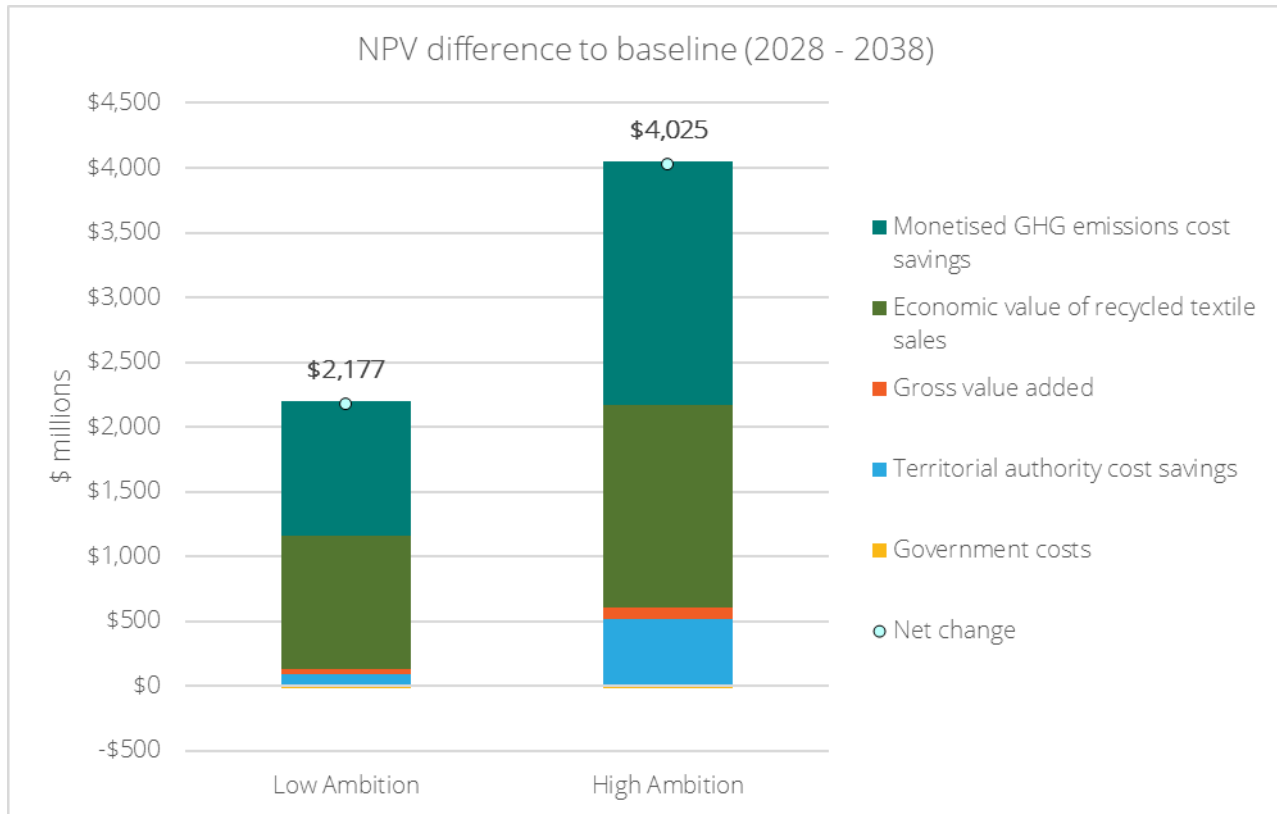
**Figure E-1: Scenario NPV Difference Compared to the Baseline (2028-2038)**



Both the low and high ambition scenarios result in an overall economic benefit; while achieving significant improvements in waste management and resource recovery, and environmental performance for the textile sector. Therefore, although the high ambition scenario incurs the greatest cost, it reflects the most substantial gains in system efficiency and sustainability with costs for waste management and resource recovery transferred from TAs and households to producers and consumers. Under the RPS scheme, these additional costs would not be borne by local government or taxpayers; they would instead be covered by obligated businesses.

With the costs of managing textile waste transferred to producers and, to a lesser extent, consumers; there are significant economic benefits realised, as shown in the figure below.

## Scenario NPV Difference Compared to the Baseline Excluding Producer Costs (2028-2038)



### Conclusion

The modelling confirms that an RPS scheme for textiles would result in net economic benefit; while transforming Aotearoa New Zealand’s approach to textile waste, aligning the country with international best practice and creating a foundation for a circular economy while shifting the cost of managing textiles waste from taxpayers and local authorities to producers and consumers. Success will depend on robust infrastructure investment, fair cost-sharing, and integration of complementary policies such as eco-design standards and repair incentives. Embedding te ao Māori and Māori governance roles within the scheme design offers additional cultural and social benefits, ensuring that the transition supports both environmental stewardship and community wellbeing.

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# Glossary

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<b>Term</b>	<b>Definition</b>
CEBM	Circular economy business models
End-of-life	The stage of the lifecycle where apparel and homeware textiles are no longer wanted and go through a management system to process it for reuse, remanufacturing, recycling or disposal. For example, a management system could be a charity shop or a textile recycling facility.
Fast fashion	Clothing that emphasises making fashion trends quickly and cheaply available to consumers. Includes clothing and textiles produced by fast fashion brands such as ASOS and Zara.
Natural fibres	Fibres made from plants as the raw material, such as wool, cotton or hemp
PRO	Producer responsibility organisation - a collective body which takes charge of meeting the legislative requirements of producers. Once a producer joins a PRO it becomes the entity which is legally responsible for ensuring that the legislative targets and requirements of the producers under RPS are fulfilled.
Regular fashion	Clothing and textiles produced by fast fashion brands such as ASOS and Zara as well as by more sustainable brands with less environmental impact. Includes all fashion that is not super-fast fashion.
RPS	Regulated product stewardship
Super-fast fashion	Inexpensive, low-quality and rapidly produced fashion from brands such as Shein and Temu. Production times and costs are compressed even further than fast fashion, often exacerbating environmental impact.
Synthetic fibres	Fibres made from the processing of fossil fuels, such as polyester and nylon
Used and waste textiles	All textiles that are not new products placed on the market. For the avoidance of doubt, this includes product returns, unsold stock, those collected following use, and all textile materials collected and processed by used and waste textiles management operators (see definition below), and textiles disposed of through residual waste
Used and waste textile management operators	Actors functioning within the used and waste textiles industry, including both municipal and private collectors, sorters, pre-processors and recyclers.

# 1.0 Introduction

## 1.1 Purpose of this Report

Several existing reports have highlighted the failures with the current market system for textiles in Aotearoa New Zealand<sup>2</sup>. Key issues include excessive consumption, over-production (leading to significant tonnages of unsold clothing being discarded), overseas manufacture of low-quality garments (often from jurisdictions that also have poor working conditions including, sometimes, the use of modern slavery), and limited collection, reuse, and recovery options meaning that most of the textile waste goes to landfill.

In late 2023, following a summit focusing on the opportunities for textiles product stewardship and the possible benefits, an advisory group was established as a collective leadership agency to progress this work in Aotearoa New Zealand. The Textiles Advisory Group (TAG) is made up of a varied membership across the textiles lifecycle including brands, community organisations, end-of-life reprocessors, councils, and researchers. Textiles offer high potential for improvement globally, especially in terms of product lifetime extension, material efficiency and reducing environmental impacts such as water consumption, waste generation, climate emissions and energy use.

To progress the shift in management of textiles in Aotearoa New Zealand from linear to circular, the TAG commissioned this report in early 2025; presenting the outcomes of research considering the potential impacts of implementing a regulated product stewardship (RPS) scheme for textiles in Aotearoa New Zealand. The research aims to build on earlier work in the sector by examining the economic model of current approaches or 'business as usual' compared with an RPS model; considering what a viable future state could look like without (or with fewer of) the resulting environmental and socio-economic impacts. The report also explores how an RPS model could support the national textiles industry more generally, and considers te ao Māori perspectives.

The key tool for assessing the potential impacts of implementing an RPS scheme for textiles in Aotearoa New Zealand is to use a cost-benefit analysis (CBA). A CBA estimates the monetised costs and benefits of a course of action or project, and uses these to determine whether the project or course of action has an overall net benefit or cost.

For clarity, this work does not include primary research into costs and benefits and is reliant on secondary sources for the input values. The definitions, range and types of textiles considered were agreed as part of the stakeholder engagement process (refer to Section **Error! Reference source not found.**), and the resulting scope is presented in A.2.0. This work also does not extend to consideration of other policies and

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<sup>2</sup> Auckland Council Waste Assessment Appendix I Fashion Clothing Consumption and Waste Flows in the Auckland Region – Towards understanding textile waste and consumption streams, September 2023. (available on the Auckland Council website)

Fashion and Textiles New Zealand (2024). Threads of Tomorrow. Available at: <https://mindfulfashion.co.nz/resources/industry-resources/threads-of-tomorrow-nz-industry-value-report-2024>

Seamless (2023). Data Report and Clothing Circularity Roadmap. Available at: <https://ausfashioncouncil.com/program/seamless/#:-:text=The%20Global%20Scan%20Report%20%26%20Clothing,sustainable%2C%20non%2Ddurable%20materials.>

UsedFULLY Textile Reuse Programme reports. Available at: <https://www.textilereuse.com/reports/>

regulations that may be required to both support an RPS and to drive a full circular economy for textiles in Aotearoa New Zealand.

While the impacts of specific supporting policies have not been modelled, the modelling has assumed that an appropriate supporting policy environment exists to enable the RPS scenarios described to be implemented effectively.

## 1.2 Background and Context

### 1.2.1 Aotearoa New Zealand Textiles Management

In Aotearoa New Zealand, the production and consumption of textiles result in used textiles and textile waste that accounts for around 5% of waste going to 'Class 1' landfills<sup>3</sup>, just over 180,00 tonnes (comprising all clothing textiles, carpets and other textiles as defined in the Solid Waste Analysis Protocol 2022<sup>4</sup>) by per year (up from just 0.5% in the 1990s)<sup>5</sup>, and very low levels of circularity achieved. The lack of services and infrastructure enabling the recovery of textiles waste also means that only a very small proportion of textile waste is recovered.

In recent years, clothing production has nearly doubled globally, due to an increase in lower cost items and higher demand for more 'new' clothing<sup>6</sup>; in addition, clothing is increasingly made from synthetic materials and synthetic blends which makes recycling more challenging. The existing research on textile waste in Aotearoa New Zealand shows that the low quality of textiles items and fast-moving trends is decreasing the reusability, longevity, and natural fibre content of each item; contributing to a significant increase in textiles waste in Aotearoa New Zealand and making it increasingly difficult to recover textiles waste and divert it from landfill. This situation is exacerbated by the limited textile recycling facilities available in Aotearoa New Zealand, explored further in section 2.

A 2024 report from Fashion and Textiles New Zealand "Threads of Tomorrow" demonstrates how the Aotearoa New Zealand fashion and textiles industry is highly reliant on global supply chains for materials and manufacturing; with global products present in virtually every retail centre and every wardrobe<sup>7</sup>. It also highlights some of the key issues with the textile and fashion industry: "*Each stage of a garment's life from fibre to-landfill creates an impact. Increased volume and speed of production and consumption are putting significant pressure on the planet's finite resources and causing negative environmental impacts*". Key opportunities highlighted in this report by Fashion and Textiles New Zealand include:

- Growing a more skilled and future-ready local workforce to address capability gaps and support the transition to a thriving, circular textiles system.

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<sup>3</sup> Class 1 landfills are also known as 'municipal landfills', and are the primary disposal option in Aotearoa New Zealand for household wastes. There will also be textiles waste going to other types of landfill (Classes 2 – 4); however, composition data for these landfills is not easily available and this makes further quantification of the textiles waste stream to landfill difficult to quantify.

<sup>4</sup> Ministry for the Environment 2022. Solid Waste Analysis Protocol. Available at: <https://environment.govt.nz/assets/Publications/Files/solid-waste-analysis-mar02-full.pdf>. This figure includes textiles beyond the scope decided for the scenarios modelled in this study.

<sup>5</sup> Ministry for the Environment, 2026. Waste Facilities and Disposal. Available at: <https://environment.govt.nz/facts-and-science/waste/waste-facilities-and-disposal/#change-in-waste-composition-to-class-1-landfills-over-time>

<sup>6</sup> Ellen MacArthur Foundation, *A new textiles economy: Redesigning fashion's future* (2017). Available at: <https://www.ellenmacarthurfoundation.org/a-new-textiles-economy>

<sup>7</sup> Fashion and Textiles New Zealand (2024). *Threads of Tomorrow*. Available at: <https://mindfulfashion.co.nz/resources/industry-resources/threads-of-tomorrow-nz-industry-value-report-2024>

- Advancing domestic materials development and manufacturing capability to retain more value onshore and improve supply chain resilience.
- Enabling circular economy through practical solutions like product stewardship schemes and investing in textile collection, repair and recovery systems to reduce waste and emissions.
- Promoting Aotearoa New Zealand fashion, clothing and textiles in both domestic and international markets to support higher-value outcomes for the sector.

Fashion and Textiles New Zealand also highlights the significance of Māori fashion and clothing, as Māori businesses are a significant part of what makes the Aotearoa New Zealand textiles industry unique.

The 2020 report by UsedFULLY 'Looking in the Mirror: A review of circularity in the clothing and textile industry in Aotearoa'<sup>8</sup> notes that the local textile industry has undergone significant change since its inception. Issues with the take, make, waste model that is currently operating, with many textiles ending up in landfill or exported to less affluent nations, are becoming more and more significant as the industry is overwhelmed by quantities of textiles consumed. With currently only small-scale operations for textile recycling in Aotearoa, there are limited options to divert this increasing waste stream from going to landfill.

Another key issue that the report highlights is the manufacturing and importing of textiles. While Aotearoa does have some (limited) onshore manufacturing for new textiles (both for textiles and fully made-up clothing items), the majority are imported fully made-up; which decreases the space in the market for local manufacturing. This lack of onshore manufacturing presents both a challenge and an opportunity for a new circular textiles model. On the one hand, consumers currently have few options to purchase locally made products. On the other hand, this creates room to establish and grow a circular textiles system within Aotearoa New Zealand. Further context on the Aotearoa New Zealand textiles industry is explored in section 2.

## 1.2.2 An Emerging Textiles Circular Economy

A significant transformation of the global textiles industry is being driven by the European Union (EU) through a suite of new and revised regulations aimed at improving sustainability and circularity. Since the launch of its Strategy for Sustainable and Circular Textiles in 2022; the EU has introduced, or is in the process of developing, legislation targeting various stages of the textiles value chain; from production and design to consumer communication, waste management, and international trade.

Key regulatory instruments include the revised Waste Framework Directive (adopted September 2025), which requires the introduction of extended producer responsibility (EPR) for textiles across the EU by 2028; including but going beyond the introduction of RPS. The scope includes clothing, footwear, accessories, household linen, curtains, and potentially mattresses; subject to decisions by individual EU member states. Eco-modulated fees will be introduced to incentivise the design of products that are more durable, repairable, and recyclable. EPR schemes require product 'producers' to take greater responsibility for the entire lifecycle of their products, including post-consumer waste management. This approach not only supports environmental goals but also offers economic and social benefits, such as reducing the financial burden on municipalities that must deal with the waste, and creating jobs in the recycling and reuse sectors at home.

Further regulation includes the Corporate Sustainability Reporting Directive (CSRD), the Green Claims Directive (on proper control of environmental claims), and the Eco-design for Sustainable Products Regulation (ESPR) which mandates certain product design requirements and a Digital Product Passport.

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<sup>8</sup> UsedFULLY Textile Reuse Programme reports. Available at: <https://www.textilereuse.com/reports/>

The ESPR Working Plan 2025–2030 identifies textiles as a priority product group for the introduction of eco-design and labelling requirements over the next five years, with the goal of promoting sustainability and circularity in product design and manufacturing. Anticipated eco-design measures for textiles are expected to align with the revised Textile Labelling Regulation, tentatively scheduled for adoption in 2027/28. This currently excludes footwear, although these items will be included at a later date.

These regulatory changes will not only affect European producers but also foreign exporters to the EU, including those in Aotearoa New Zealand. The recently ratified EU–New Zealand free trade agreement (FTA) enhances market access for Aotearoa New Zealand exporters but also binds both parties to uphold the Paris Agreement and collaborate on climate and environmental issues. For the first time in an EU trade agreement, the FTA includes enforceable commitments with the potential for trade sanctions in cases of serious environmental non-compliance.

Despite these developments, Aotearoa New Zealand has yet to implement formal sustainability requirements for its textiles sector. While the country operates both voluntary and regulated product stewardship schemes, textiles have not yet been prioritised. There is currently no government policy specifically addressing sustainable textiles design, procurement, or waste management; and the sector faces challenges such as the influx of low-quality imported clothing, saturated reuse markets, and increasing textile waste to landfill.

Nonetheless, industry-led initiatives are emerging. Organisations such as UsedFULLY and Fashion and Textiles New Zealand, supported by the Ministry for the Environment's Waste Minimisation Fund and Auckland Council, are advocating for and working towards a more circular textiles economy. These efforts include the Textile Reuse Programme (from which UsedFULLY was born) and the establishment of the TAG. The current state of play in terms of textiles collection, reuse and recycling in Aotearoa New Zealand is covered in more detail in Section 3.1.

Given the international regulatory landscape and the growing need for domestic action; through this work, the TAG seeks to inform policy decisions around implementing an RPS for textiles in Aotearoa New Zealand.

## 1.2.3 What is Product Stewardship?

Product stewardship schemes are a tool that can shift markets towards more sustainable and equitable outcomes, with greater responsibilities for 'producers' across the full lifecycle of their products.

The intention of product stewardship schemes is to 'internalise externalities' and deal with so-called 'market failures'; i.e. the costs that are not normally picked-up by commercial manufacturers and importers (notably the costs of managing the waste product at its end of life), and potentially not at all (e.g. the upstream environmental impacts of production, such as pollution from dyeing). Producers funding end-of-life costs allows the gap to be filled between the net revenues that can be obtained from commercial waste management and resource recovery operations (which are often low and can, in some cases, be negative), and the actual cost of proper environmental management to meet desirable environmental outcomes.

The aim can also be to encourage those involved throughout the supply chain to change working practices to ensure that external impacts are minimised. Early product stewardship schemes in Europe, and most outside of Europe, have focused on ensuring that systems are in place to collect and recover, or safely dispose of, the in-scope products once they reach their end-of-life; this being funded by the producers. Many existing product stewardship schemes in Aotearoa New Zealand reflect this approach, with solutions usually sitting in the middle levels of the waste hierarchy (recycling, recovery).

True circular product stewardship needs to focus on moving to the upper levels of the hierarchy (prevention, reuse); and this is reflected in more recent European schemes which have been more ambitious; introducing incentives to improve product design for durability, use of sustainable materials, and to facilitate repair, reuse and recycling.

The Australian scheme for clothing 'Seamless'<sup>9</sup> is a voluntary product stewardship scheme which incorporates an eco-modulation approach to encourage clothing production using mono-materials (which facilitates sorting and recycling). Seamless propose to expand the eco-modulation criteria and reward businesses that have circular operation models; they are currently working on seven pilot projects with partners across the Australian clothing and textiles industry.

Importantly, RPS/EPR obligations apply to both domestically-produced and imported products, helping to level the playing field and reduce the prevalence of low-quality imports. Obligated producers generally include manufacturers, importers and/or brand owners; while retailers/distributors may also have certain obligations placed upon them. Under an RPS model, participation in the scheme for producers is mandated. This prevents the problem of 'free riders'; where some importers/manufacturers avoid contributing to the scheme, placing a greater burden on those that do participate and fund the initiative.

### **France's Approach to Tackling 'Fast Fashion'**

France has introduced measures under its EPR scheme for textiles to tackle the environmental impact of 'super-fast fashion' (referred to as super-fast fashion in this report). A key element is the proposed "fast fashion tax"<sup>10</sup>, which will apply to low-cost, high-turnover clothing items. The tax aims to discourage overproduction and incentivise brands to adopt more sustainable practices, such as using durable materials and reducing waste. Revenue from this tax will help fund recycling initiatives and support circular economy programs within the textiles sector.

To pay for the cost of managing products at the end of their life, a fee is typically applied to the in-scope products when they are placed on the market (often termed an advanced recycling fee [ARF] or advanced stewardship fee [ASF]), or as a retrospective charge for the costs incurred; based, for example, on a producer's market share. Variations to the fee (often referred to as eco-modulation) may be made to reward products that have a lower environmental impact – e.g. those that are easier to recycle or have greater durability. Such modulated fees are now mandated in EU EPR schemes, although application at scale is, to date, quite limited (France being the greatest exponent).

## **1.2.4 Limitations of Regulated Product Stewardship**

RPS/EPR schemes are just one type of tool that can be applied to address 'market failures', and deal with externalities. Work in Europe and elsewhere has recognised, however, that RPS/EPR cannot do everything, even where eco-modulation is applied; hence it should be considered as the foundation stone of a suite of holistic and integrated policy initiatives that are directed towards addressing the problem.

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<sup>9</sup> [Clothing system - Seamless Australia](#)

<sup>10</sup> Proposition de loi visant à réduire l'impact environnemental de l'industrie textile. Available at: [https://www.assemblee-nationale.fr/dyn/17/textes/117b1557\\_proposition-loi](https://www.assemblee-nationale.fr/dyn/17/textes/117b1557_proposition-loi)

For example, the Changing Markets and the European Environmental Bureau (EEB) report 'Driving a Circular Economy for Textiles through EPR',<sup>11</sup> and WRAP's 'Textiles Policy CBA' report,<sup>12</sup> both from 2022, note that EPR or RPS aren't without their limitations, and emphasise the need for complementary policies such as:

- Eco-design mandates: minimum requirements for durability, modularity, and disassembly.
- Hazardous chemical bans: restricting toxic substances in textiles improves recyclability and protects health, both for those making the garments, and for wearers during the use phase of the product.
- Recycled content targets: mandating recycled fibre use can stimulate demand and investment in recycling technologies.
- Sales tax reductions on repair: fiscal incentives can make repair more accessible and attractive to consumers.
- Data transparency: robust reporting and verification of material flows are needed to track progress and enforce accountability.

Other complementary policies and initiatives can include:

- Mandating or promoting sustainable procurement (for example, the recent mandate in relation to the procurement of wool carpets in NZ)<sup>13</sup>
- Undertaking behaviour change programmes to inform commercial and domestic consumers of the impacts of their choices and providing information to enable better choices
- Product labelling: including initiatives such as the Government supported Eco-choice Aotearoa,<sup>14</sup> and EECA Energy Rating<sup>15</sup> programmes, certifying products as meeting set standards in relation to their environmental impacts.
- Direct investment: another type of supporting action including government grant programmes and direct investment by agencies such as Green Investment Finance.<sup>16</sup>

In the EU, almost all of these complementary policies are being put in place, as noted in Section **Error! Reference source not found.**

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<sup>11</sup> Changing Markets & the European Environmental Bureau (2022). Driving a Circular Economy for Textiles through EPR. Available at: <https://eunomia.eco/reports/driving-a-circular-economy-for-textiles-through-epr/>

<sup>12</sup> WRAP (2022). Textiles Policy CBA. Available at: <https://www.wrap.ngo/sites/default/files/2023-03/2023%2003%2020%20Textiles%20CBA%20-%20Final%20Report.pdf>

<sup>13</sup> Textile Products (2025). What NZ's New Wool Procurement Rules Mean for Architects, Builders, and Developers. Available at: <https://textile.co.nz/what-nzs-new-wool-procurement-rules-mean-for-architects-builders-and-developers/>

<sup>14</sup> Eco Choice Aotearoa (n.d). Homepage. Available at: <https://ecochoiceaotearoa.org.nz/>

<sup>15</sup> Energy Efficiency & Conservation Authority (n.d). Energy Rating Label. Available at: <https://www.eeca.govt.nz/regulations/equipment-energy-efficiency/about-energy-rating-labels/energy-rating-label/>

<sup>16</sup> New Zealand Green Investment Finance (n.d). Homepage. Available at: <https://www.nzgif.co.nz/>

## 2.0 State of Play

### 2.1 The New Zealand Textiles Sector

#### 2.1.1 Textile Manufacturing and Flows

An industry assessment done for Auckland Council's 2023 Waste Assessment notes that most Aotearoa New Zealand manufactured textile brands tend to engage in the production of clothing and textiles that do not follow the fast fashion philosophy<sup>17</sup>; *"instead, clothes are made in small batches and frequently sold out before manufacture is complete. For items produced on a slightly larger scale, such as knit products in wool fibre (e.g., merino wool), there is the benefit of timelessness, which means retailers are not required to discard clothing before sale as it remains fashionable, and acceptable, for extended periods of time."* The assessment notes that natural fibres like merino wool and harakeke are a key element of Aotearoa New Zealand's more sustainable textile practices.

In 2023, Ernst and Young and Fashion and Textiles New Zealand assessed the contribution of the Aotearoa New Zealand textile sector to the country's economy and published findings in the Threads of Tomorrow report. The majority of businesses (more than 75 per cent) that participated in the Threads of Tomorrow analysis self-identified as a micro, small or medium enterprise, with \$15 million annual turnover or less. According to this study, the sector contributed \$7.8 billion to the economy in 2023, equivalent to 1.9% of GDP and employed 76,000 people, or 2.6% of the workforce.<sup>18</sup>

Small to medium designers and brands (small and medium sized enterprises, SMEs) were found to be more likely to use Aotearoa New Zealand-based manufacturers in their production chain; in fact, 60 per cent of these businesses carried out at least some of their production using Aotearoa-based manufacturers and 36 per cent used entirely Aotearoa-based manufacturers.<sup>19</sup> Larger businesses with \$15 million or higher annual turnover did not tend to use as many Aotearoa New Zealand-based businesses in their supply chain. The overall estimated flow of textiles in the economy is shown in Figure 2-1.

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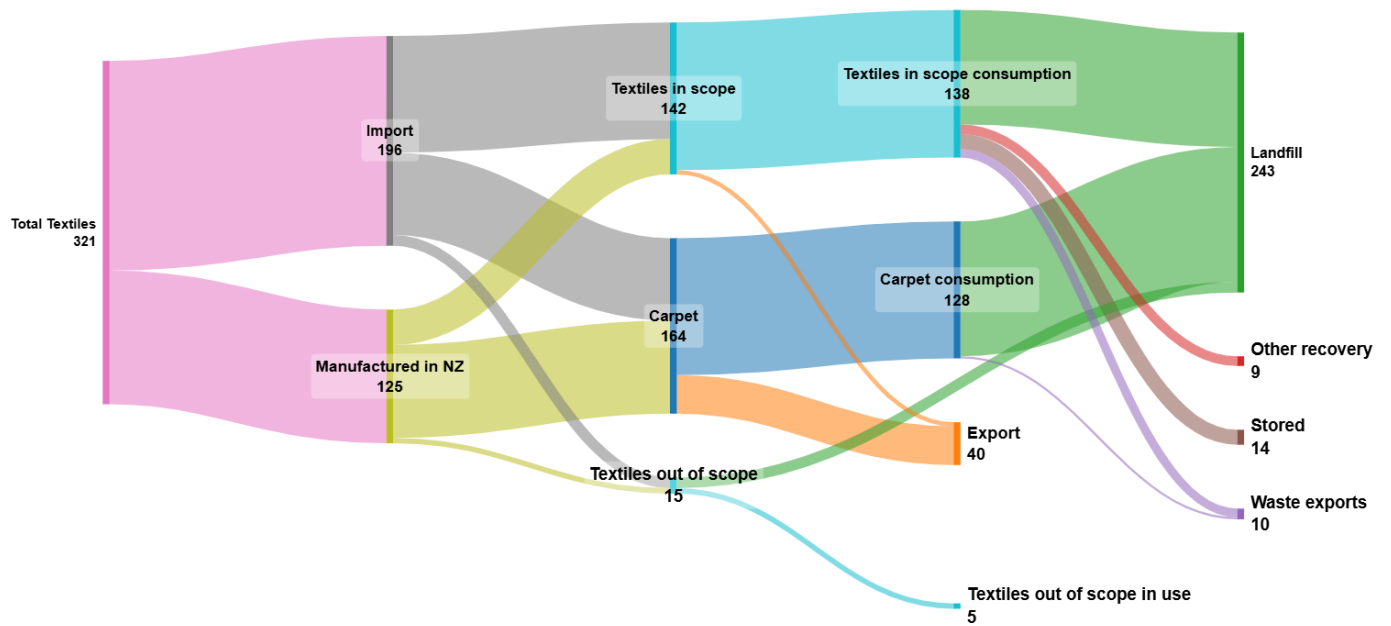
<sup>17</sup> Sapere (2020). Fashion Clothing Consumption and Waste Flows in the Auckland Region. Available at:

<https://new.aucklandcouncil.govt.nz/content/dam/ac/docs/plans/waste-strategy/waste-assessment-appendix-i.pdf>

<sup>18</sup> Fashion and Textiles New Zealand NZ (2024). Threads of Tomorrow. Available at: <https://wecreate.org.nz/mindful-fashion-nz-report-threads-of-tomorrow/>

<sup>19</sup> Fashion and Textiles New Zealand NZ (2024). Threads of Tomorrow. Available at: [MFNZ-Threads-of-Tomorrow-FINAL-REPORT.pdf](#) p12.

**Figure 2-1: Indicative Flow of Textiles in the NZ Economy ('000 tonnes) – Eunomia Analysis**



Estimates suggest that 321 kilo-tonnes of textiles (including carpet) are imported (196kt, 61%) and manufactured (125kt, 39%) in the Aotearoa New Zealand economy annually, with exports accounting for only 40kt.<sup>20</sup>

## 2.1.2 Environmental and Social Impacts

In Aotearoa New Zealand, the production and consumption of textiles result in rapidly increasing quantities of used textiles and textile waste, with very low levels of circularity achieved. Excluding carpet, which is out of scope for this study, it is estimated (using the data gathered for this study, Figure 2-1) that of 138,000 tonnes of apparel consumed, only 9,000 tonnes (6.5%) annually is currently recovered for reuse or recycling in Aotearoa New Zealand, with a further 10,000 tonnes of used textiles exported (7.2%)<sup>21</sup>, and 14,000 tonnes (10%) stored (hoarded) by consumers. Most used clothing becomes waste and goes to landfill; around 105,000 tonnes (76% of consumption) per annum.

The textiles lifecycle creates a series of negative impacts from production through use to final disposal; and through long, international value chains, often characterised by a lack of transparency and traceability. The current linear system for producing, consuming and disposing of clothing extracts large amounts of non-renewable resources for clothing that is frequently only used for short periods of time - it is estimated that more than half of all fast fashion produced is disposed of in under a year.<sup>22</sup>

<sup>20</sup> These figures are from 2024 data and notes that it is an estimate produced by Eunomia

<sup>21</sup> The data for this assumption has come from data gathered from NZ stats for imports and exports of textiles within scope, MfE Landfill data and *The Formary (2020), Looking in the mirror: A review of circularity in the clothing and textiles industry in Aotearoa*, by Bernadette Casey and Brian Johnston. For the out-of-scope textiles, the numbers are approximate for illustration purposes and exclude fibres.

<sup>22</sup> A New Textiles Economy: Redesigning Fashion's Future. Ellen MacArthur Foundation 2017.

In 2022, for example, textile consumption for each person in the EU required, on average, 323m<sup>2</sup> of land, 12m<sup>3</sup> of water, 523kg of raw material inputs, and caused the equivalent of 355kg of CO<sub>2</sub> emissions.<sup>23</sup> The European textile sector was the third largest source of water degradation and land use globally in 2020, according to the European Environmental Agency.<sup>24</sup> Much of this is related to cotton, which is very resource-intensive to grow.

Manufacturing of textiles also involves a wide variety of chemicals and related impacts, most notably in connection with scouring, dyeing and finishing processes. These include (but are not limited to) flame retardants, polyfluorinated substances (PFAS), lead and chromium, phthalates, chlorine bleach, azo dyes<sup>25</sup>, volatile organic chemicals (VOCs) such as formaldehyde, and antimicrobial agents that foster bacterial resistance.<sup>26</sup> These substances range from those that are merely skin irritants to hormone disruptors to potential, if not certain, carcinogens. Synthetic fibres also release microplastics into the environment during use and washing. The long-term impact of microplastics on humans is still largely unknown, although they are clearly having a negative impact on wildlife in our oceans and elsewhere<sup>27</sup>.

There is also widespread exposure of workers to hazardous chemicals at multiple stages of production. In cotton fields, labourers regularly encounter pesticides and herbicides; often suffering from acute poisoning, chronic illnesses, and long-term environmental harm. Factory workers who process textiles face similar dangers, handling synthetic dyes, formaldehyde, and flame retardants that can lead to respiratory issues, skin irritation, and even cancer. In garment assembly plants, finishing treatments involving phthalates and nonylphenol ethoxylates (NPEs) further expose workers to toxic substances. These chemicals do not disappear after production; they remain embedded in the fabrics, posing ongoing health risks to consumers through skin contact.<sup>28</sup>

Aotearoa New Zealand does have restrictions on certain hazardous chemicals being used in textiles that are imported or made domestically, with the system regularly updated (e.g. banning certain persistent organic pollutants). However, anecdotally, enforcement is limited and it is currently less comprehensive than the EU REACH system (Registration Evaluation and Authorisation of Hazardous Chemicals). The EU REACH system progressively bans and restricts an ever-increasing range of chemicals from products, including textiles, as their toxicity is proven.

To summarise (as put by the Ellen MacArthur Foundation in their work on fast fashion globally) the current textile system (in Aotearoa New Zealand and elsewhere) leaves economic opportunities untapped, excessive pressure on resources, and increases damage to the environment and society<sup>29</sup>.

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<sup>23</sup> European Environment Agency, via the EU Parliament summary on Fast fashion: EU laws for sustainable textile consumption, updated 12-09-2025

<sup>24</sup> European Environment Agency, via the EU Parliament summary on Fast fashion: EU laws for sustainable textile consumption, updated 12-09-2025

<sup>25</sup> Azo dyes are a group of synthetic colourants containing a nitrogen-to-nitrogen double bond. They make up a large proportion (up to 60-70%) of colourants used, and can form carcinogenic compounds when they break down in contact with moisture (e.g. sweat or saliva).

<sup>26</sup> Pinto, V. C. D., & Peleg Mizrahi, M. (2025). The Health Impact of Fast Fashion: Exploring Toxic Chemicals in Clothing and Textiles. *Encyclopedia*, 5(2), 84. <https://doi.org/10.3390/encyclopedia5020084>

<sup>27</sup> Li, Y et al (2023) "Potential Health Impacts of Microplastics" published in *Environment and Health*, volume 1, issue 4.

<sup>28</sup> Pinto, V. C. D., & Peleg Mizrahi, M. (2025). The Health Impact of Fast Fashion: Exploring Toxic Chemicals in Clothing and Textiles. *Encyclopedia*, 5(2), 84. <https://doi.org/10.3390/encyclopedia5020084>

<sup>29</sup>

A New Textiles Economy: Redesigning Fashion's Future. Ellen MacArthur Foundation 2017

## 2.1.3 Textiles Sector Economics

*“Shifting to sustainable and circular business models can cost businesses more, especially while efficiencies are being built in the short term. For example, investment may be required to purchase machinery and infrastructure, establish traceable supply chains, switch to low-carbon and circular fibres and materials, pay living wages, or introduce circular business models such as repair and takeback.”<sup>30</sup>*

Local and central government funds and private capital have already enabled the exploration of non-fossil fuel-based fibres and textile products in Aotearoa New Zealand, along with the establishment of recycling options for cellulosic and some synthetic-based textiles (as shown in case studies below).

Fibre selection is another consideration in the overall textile economy. There are several initiatives across the country looking at the climate, social and economic advantages of Aotearoa New Zealand-grown regenerative fibres or fibre blends; meeting some of the demand for fibre inputs to displace reliance on fossil fuel-based fibres. These initiatives include bioproduct and fibre technology innovation at the Bioeconomy Science Institute<sup>31</sup>) and Lincoln University, exploring how science and technology are transforming the way we think about wool - from a traditional commodity to a high-performance fibre that meets current and developing markets.

Some key initiatives are highlighted in the case studies described below.

### Table 2-1: Key Initiative Case Studies<sup>32</sup>

#### **Fashion and Textiles New Zealand**

In 2025 Fashion and Textiles New Zealand funded a project called the Future of Fibre Aotearoa, looking at the potential for fibre, textiles and biomaterials to form key components of a new economy based on natural products. The project will look at how materials grown and processed in Aotearoa New Zealand - wool, hemp, leather, cashmere, harakeke, and forestry-derived fibres - can overcome fragmentation, scale and under-investment challenges. This pilot aims to connect the full value chain of Aotearoa New Zealand's fibre, textiles and biomaterials, lifting the sector from commodity export to high-value, design-led regenerative and circular products and systems.

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<sup>30</sup> Fashion and Textiles New Zealand NZ (2024). Threads of Tomorrow. Available at: [MFNZ-Threads-of-Tomorrow-FINAL-REPORT.pdf](#) p18.

<sup>31</sup> “the Bioeconomy Science Institute is a consolidated Crown Research Institute that merged four formerly independent research organizations: AgResearch, Manaaki Whenua – Landcare Research, Plant & Food Research, and Scion”

<sup>32</sup> The case study details are accurate at the time of writing in 2025, these details may have changed since this time.

## Venture Taranaki

Venture Taranaki has been exploring alternative land uses that can compete with dairy, create new revenue streams, unlock access to growing markets, and support adaptation to a changing climate. Phase one identified 11 innovative, commercially-viable food and fibre value chain opportunities, with potential to strengthen and diversify the Taranaki economy specifically<sup>33</sup>. Phase two involved conducting crop trials around the region and investigating value chain development opportunities. Hemp was identified as one of the key fibres with market potential.

## Auckland University of Technology

Auckland University of Technology (AUT)'s Smart System Material Manufacturing Research Centre operates the Future Fibres Lab; where research currently focuses on the potential for plant fibres from within Aotearoa New Zealand to replace non-renewable materials in meeting highly technical needs, while providing benefits such as more sustainable manufacturing, longer-lasting products, and job creation. The Centre has a focus on collaboration with Māori, industry, government, and other local and international partners.

## UsedFULLY

UsedFULLY is a textile 'cleantech' company that initially trialled textile-to-textile (T2T) recycling; however, this proved economically unfeasible in a small remote island nation like Aotearoa New Zealand. This prompted the exploration of the highest value applications for recycled textile fibres. UsedFULLY's solvent-free textile recycling technology was originally developed by the Bioeconomy Science Institute (NZ) and adapted to textile processing; creating alternative, high value markets for unwanted textiles. The process converts unwanted clothing and textiles into high-performance fibres for construction, roading, protective coatings, and polymer industries - decarbonising the textile industry while also providing sustainable materials for a range of other industries through direct replacement of high carbon, virgin products.

## Carrfields

Seeing the growth opportunity for the plant-based and natural fibre sector, South Island wool producers Carrfields partnered with Hemp NZ more than a decade ago to establish New Zealand Natural Fibres (NZNF). The entity has received more than \$3.2 million in funding since 2021 from the Government's Sustainable Food and Fibre Futures Fund to establish growing, processing and marketing capability with wool and hemp blends for soft furnishings and high-performance outerwear. This initiative aligned strongly with MPI's investment programmes *Fit for a Better World*, the government's food and fibre sector roadmap<sup>34</sup> which ceased to exist after 2023.

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<sup>33</sup> Venture Taranaki (2025). Branching Out. Available at: <http://www.venture.org.nz/sector-development/food/branching-out/>

<sup>34</sup> Ministry for Primary Industries (2023). Fit for a Better World. Available at: <https://www.mpi.govt.nz/dmsdocument/57295-Fit-for-a-Better-World-2023-progress-update>

Influencing the market further through tools such as an RPS will drive the additional investment needed to shift the textiles economy to a more circular approach, including expanded onshore recycling and reuse opportunities which will come with associated economic growth and employment.

## 2.1.4 Textiles Reuse and Recycling

### Reuse

Various agencies - charities, territorial authorities and brands - attempt to support and fund textile recovery initiatives; offering community recycling centres and bins to drop off unwanted clothing. However, the viability of these programmes will always be limited by the availability and economics of recovery solutions.

The Salvation Army estimates that annually only 20 per cent of the clothing received for reuse in Aotearoa New Zealand is of a quality that can be sold second-hand, while the remaining 80 per cent goes directly to landfill.<sup>35</sup> Waste Management New Zealand notes that in the last eight years, the amount of clothing waste taken to landfill in Auckland has doubled; as a result, they believe, of the increased consumption of fast fashion.<sup>36</sup> This is not just a problem being experienced in Aotearoa New Zealand, with similar issues being faced worldwide. Ballina Shire Council in New South Wales, Australia, conducted a waste audit that found 80 per cent of discarded clothing sent to landfill was in perfect or near-perfect condition, providing evidence that low-cost fast fashion is driving 'throwaway' consumer attitudes.<sup>37</sup>

The growing quantity of low-quality clothing in the market will result in lower prices for the used items and also increases sorting and disposal costs to remove the increasingly high proportion that cannot be on-sold. This risks operating costs for the reuse sector coming close to or exceeding their revenue. Several organisations rely on financial grants to survive. The charity Common, which was providing clothing donated by the public or excess stock from retailers to services including Rainbow Youth and Victim Support, has recently had to close down due to a lack of funding<sup>38</sup> while Ripple Movement for used children's clothing and other textiles has also stopped collection after just three years, during which it rehomed just 4.4 tonnes of items<sup>39</sup>.

As noted earlier in Section 1.2.1, it is estimated (by Eunomia from the study data) that only 6.5% of the apparel consumed in Aotearoa New Zealand is reused or recycled domestically. A further 7% of used apparel is exported, largely with the intention of reuse. However, export of waste textiles overseas is complex and requires an export permit from both the New Zealand Environment Protection Authority and the importing country's government under the Basel Convention. Export comes with risk for the brands; with the dumping, landfilling and burning of textiles being common in some less developed countries.

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<sup>35</sup> Sapere (2020). Fashion Clothing Consumption and Waste Flows in the Auckland Region. Available at:

<https://new.aucklandcouncil.govt.nz/content/dam/ac/docs/plans/waste-strategy/waste-assessment-appendix-i.pdf>

<sup>36</sup> 1news (2023). NZ landfill boss sees alarming rise in clothing waste. Available at: <https://www.1news.co.nz/2023/03/12/nz-landfill-boss-sees-alarming-rise-in-clothing-waste/>

<sup>37</sup> ABC News, Australia, September 2025

<sup>38</sup> RNZ (2025) Common forced to close door after grants declined. Available at:

<https://www.rnz.co.nz/news/national/574502/charity-common-forced-to-close-door-after-grants-declined>

<sup>39</sup> Ripple Movement (n.d). Available at: [www.ripplemovement.co.nz](http://www.ripplemovement.co.nz)

Aotearoa New Zealand exports thousands of tonnes of second-hand clothing to Papua New Guinea (PNG) annually, primarily through for-profit companies like SaveMart<sup>40</sup>. In 2022, 5,469 tonnes of worn clothes were exported to PNG, according to Stats NZ. It is reported that about 30 per cent of the clothing is of low quality and can't be resold. The viability of the local clothing manufacturing industry is also hindered by these low-quality imports.<sup>41</sup>

## Recycling

Textile recycling options in Aotearoa New Zealand have remained limited with only a small number of recyclers operating and low operational capacity. The Threads of Tomorrow report identified only six onshore textile recyclers within Aotearoa New Zealand.<sup>42</sup>

Overall, it is estimated that only one per cent of the textiles consumed annually in Aotearoa New Zealand are recycled onshore. Section 4.2 has further details in relation to the baseline data for the modelling.

Entities that have explored fibre-to-fibre or closed-loop recycling have found it near impossible to commercialise. For example, Little Yellow Bird was offering a recycling bag for \$25<sup>43</sup> for natural fibres such as 100% cotton, merino, wool, linen, hemp, silk (excluding synthetics). However, this offering has recently disappeared from their website after the Swedish recycling partner Renewcell went into receivership. Australian organisation After<sup>44</sup> offers paid-for collections in Auckland (e.g. \$40 for up to 10kg) and, via Textile Recyclers Australia (TRA), the clothing is exported to India where the textiles are converted to recycled yarn and carpet underlay.

The more feasible and low-risk, low-emissions recycling options are onshore and 'open loop' – where textiles are used as a fibre source into other products. However, these are currently at a small scale. The main Aotearoa New Zealand players are:

**Textile Products**, which down-cycle textiles into products such as removal blankets, underlays and geo-textiles. Impactex is an aggregator and redistributor of textiles for reuse and recycling through Textile Products. Products are mainly felted and flock items made into relatively low-value items like mouse mats, signage panels, temporary building site protection, and carpet underlay.

**UsedFULLY's** larger volume and higher value applications (\$2,000 to \$25,000 per tonne) turn unwanted textiles into performance additives for industrial applications, for example, as asphalt modifiers and construction products.

The global textile recycling industry is growing, with new technologies emerging in response to market drivers such as changes in fabric types.

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<sup>40</sup> SaveMart (n.d). Recyclability. Available at: <https://www.savemart.co.nz/recyclability>

<sup>41</sup> Stuff (2023) This is no dumping ground': NZ exporting thousands of tonnes of second-hand clothes to PNG Available at: <https://www.stuff.co.nz/life-style/style/131932252/this-is-no-dumping-ground-nz-exporting-thousands-of-tonnes-of-secondhand-clothes-to-png>

<sup>42</sup>Fashion and Textiles New Zealand (2024). Threads of Tomorrow. Available at: [MFNZ-Threads-of-Tomorrow-FINAL-REPORT.pdf](#), P14

<sup>43</sup>Little Yellow Bird (n.d). Circularity. Available at: <https://www.littleyellowbird.com/pages/circularity>

<sup>44</sup> After (n.d). Homepage. Available at: [www.after.net.nz](http://www.after.net.nz)

Panipat, in north India, is estimated to recycle approximately 1 million tonnes of textile waste<sup>45</sup> annually through its 20,000 industrial units and a workforce of at least 300,000.<sup>46</sup> Shipments of discarded clothing are shredded, spun back into yarn and woven into rugs, throws, sheets and cushions destined for international retailers. This recycling of textiles has, however, led to increasing reports of lung disease, skin conditions and even cancer amongst workers in Panipat.<sup>47</sup>

There are technical limitations to chemical fibre-to-fibre recycling. It can be an option for polymers such as polyester or polyamides/nylon, but needs an independent 3rd party life-cycle analysis to demonstrate the environmental benefit relative to landfilling. Polyethylene and polypropylene can only be meaningfully recycled by a multistep process involving gasification, methanol synthesis and conversion to olefins; however, this process has yet to be demonstrated as economically viable.

In Australia, Samsara Eco, a biotech innovator, developed a new technology with the support of the Australian Government's national science agency, the CSIRO; using enzymes to break down synthetic textiles (polyester and nylon) into their monomer building blocks to be made into new synthetic textiles. The company has signed a 10-year deal with Lululemon to supply 20 per cent of their new textile inputs as recycled textiles by 2035.<sup>48</sup>

Overall, there is a lack of funding and investment drivers to help scale the solutions and technologies, and thereby to help grow the market and industry in Aotearoa New Zealand. RPS is a mechanism to help source the funding for those approaches from the producers/importers, and to provide the infrastructure investment for a cohesive, integrated approach.

## 2.2 Te Ao Māori and Te Tiriti o Waitangi

A unique aspect of waste management in Aotearoa New Zealand is the consideration of te ao Māori.

Te ao Māori considerations are increasingly being incorporated into waste management in Aotearoa New Zealand; reflecting growing awareness of and commitment to Te Tiriti o Waitangi and recognition that traditional waste management practices, and mātauranga Māori (knowledge) and tikanga (customs) more generally, are closely aligned with zero waste and circular economy approaches.

Some Māori believe that the beginning of life started with only darkness, Te Kore, a void. From Te Kore emerged Ranginui, the sky father, and Papatūānuku, the earth mother, who held each other in a seemingly inseparable embrace. Ranginui and Papatūānuku had many children, some of which grew tired of the darkness they lived in. Several children tried to separate the parents, until Tāne Mahuta (Tāne) succeeded by lying on his back and pushing his father up into the sky with his legs, away from his mother who remained on the ground. This became the world as we now know it, with the children now atua (gods) who act as kaitiaki (guardians) for all parts of nature including people, land, waterways, animals, and agriculture. Tāne is also often credited for creating the first human woman, Hineahuone. He moulded her from clay and soil, then breathed hau (essence) or mauri (life) into her nose, and she sneezed and came to life. These creation myths can connect Māori to their whakapapa. As descendants of atua, mana whenua are connected to te taiao (the environment) and act according to

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<sup>45</sup> Outlook Planet (2025). Panipat's Booming Textile Recycling Industry: How Waste Colonisation is Polluting India's Rivers. Available at: <https://www.outlookbusiness.com/planet/circularity/panipat-textile-recycling-waste-colonisation-pollution?>

<sup>46</sup> DownToEarth (2024). City where the promise of good health turns to ash. Available at: <https://www.downtoearth.org.in/pollution/city-where-the-promise-of-good-health-turns-to-ash-95709>

<sup>47</sup> The Guardian (2025). Fast-fashion recycling: how 'the castoff capital of the world' is making Indian factory workers sick. Available at: <https://www.theguardian.com/global-development/2025/oct/07/indian-factory-workers-fast-fashion-recycling-panipat-discarded-clothing>

<sup>48</sup> Samara eco (n.d). Homepage. Available at: <https://www.samsaraeco.com/>

kaitiakitanga (guardianship) principles (it is noted that Māori are not a homogenous group, and that narratives, principles, and priorities will vary to an extent between groups and individuals).

Māori were the first ethnic group to settle in Aotearoa New Zealand and arrived from East Polynesia as early as the 13<sup>th</sup> century. The British first arrived in Aotearoa New Zealand in 1769, with large-scale settlement beginning in 1840. He Whakaputanga o te Rangatiratanga o Nu Tireni (Declaration of Independence of the United Tribes of Aotearoa New Zealand) and Te Tiriti o Waitangi (the Treaty of Waitangi) are said to be the founding documents of Aotearoa New Zealand. He Whakaputanga was signed in 1831, likely in response to potential colonisation by the French, and Te Tiriti was signed in 1840, likely in response to extensive purchases of land by the New Zealand Company.<sup>49</sup> While He Whakaputanga was written in Māori, Te Tiriti had two versions – Te Tiriti o Waitangi in Māori and The Treaty of Waitangi in English. Most signatures collected from rangatira (chiefs) were on the Māori version. While Māori understood what they were signing in te reo, they didn't know that the English version held different meanings.

Interpretations between the Māori and English versions of te Tiriti o Waitangi and the Treaty of Waitangi are greatly disputed. Some groups have deduced three principles - partnership, participation, and protection.<sup>50</sup> These principles act as tohu (guides), to ensure that Māori are included in active partnership with the Crown, that Māori rangatiratanga (sovereignty) is upheld, and that taonga (property, treasures), including the environment, are protected. Mana whenua inclusion (the partnership principle) and mātauranga Māori (the participation principle) can support solutions (the protection principle) that not only uphold responsibilities to the treaties but also benefit te taiao, Māori, and others.

Before British settlement, Māori had waste systems that were sanitary and organised, and protected residents and the environment. Māori used middens and latrines located away from living areas, and used water was deposited to land rather than bodies of water. With settlement came new challenges such as new material types, increased volumes of waste, and houses built with poor access to organised disposal of waste and water.

When considering waste alongside kaitiakitanga, para kore (zero waste) is prioritised. This approach aligns with a circular economy; where, if material at end-of-use is unavoidable, it is recovered - however para kore also expects recovery to be done in a way that does not harm te taiao. Para kore uses mātauranga Māori (knowledge) and tikanga (customs) to determine the best pathways to minimise and manage waste. It also considers generations to come and how current generations can reduce harm done to te taiao now.

The relationship between the te ao Māori worldview and an RPS scheme for textiles in Aotearoa New Zealand was investigated through a focused workshop. The engagement explored how mātauranga Māori could effectively strengthen this environmental tool and is presented through stakeholder reflections in section 2.5 and A.1.1.2.

The legal implications of Te Tiriti o Waitangi are complex:

*“Unless given the force of law by an Act of the New Zealand Parliament, treaty duties do not give rise to legal obligations on the Crown. Despite the limits on the legal enforceability of the Treaty of Waitangi, like*

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<sup>49</sup> <https://natlib.govt.nz/he-tohu/korero/interview-with-dame-anne-salmond>

<sup>50</sup> <https://www.auckland.ac.nz/en/news/2024/09/25/how-the-treaty--principles--evolved-and-why-they-don-t-stand-up.html>

*all treaties, it gives rise to duties on the Crown which, as a matter of conscience, the Crown should comply with as far as practicable.”<sup>51</sup>*

The Treaty of Waitangi Act 1975 established the Waitangi Tribunal as a commission of inquiry to consider claims by Māori against the Crown regarding “*claims relating to the practical application of the principles of the Treaty and, for that purpose, to determine its meaning and effect and whether certain matters are inconsistent with those principles.*”<sup>52</sup>

The differences in the Māori and English texts of Te Tiriti have led to different understandings of the meaning of the document. These differences, coupled with the need to apply Te Tiriti in contemporary circumstances, led Parliament to refer to the principles of Te Tiriti in legislation and the enactment of the Treaty of Waitangi Act 1975 and subsequent establishment of the Waitangi Tribunal.

The principles of Te Tiriti provide “*for the exercise of kawanatanga, while actively protecting tino rangatiratanga of tangata whenua in respect of their natural, physical and spiritual resources*”<sup>53</sup> Upholding the principles of Te Tiriti in the context of textiles, while not legally binding as legislation currently stands for RPS in Aotearoa New Zealand (as there is no direct reference in the WMA 2008), a scheme should consider te ao Māori concepts, such as, for example, kaitiakitanga, wairua and whakapapa.

## 2.3 Waste Minimisation Act (2008)

The Waste Minimisation Act 2008 (WMA)<sup>54</sup> is the primary legislation governing activity in relation to the waste sector. It contains a number of key tools for directing activity in relation to waste. These key parts are outlined below:

### 2.3.1 Part 2: Product Stewardship.

The legislation currently allows for two types of product stewardship

- **Voluntary**, where industry bodies voluntarily choose to develop a product stewardship scheme.
- **Mandatory (priority products)**: when a product has been declared a ‘priority product’ a product stewardship scheme must be developed, and accreditation must be obtained as soon as practicable<sup>55</sup>.

Under both approaches, the scheme that is developed must be submitted to the Minister and approved to become an accredited scheme.

In July 2020, the Government announced six products to be declared ‘priority products’ for the establishment of product stewardship schemes under the Waste Minimisation Act 2008 (WMA).

The products were:

- plastic packaging

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<sup>51</sup> He Tirohanga o Kawa ki te Tiriti o Waitangi. A Guide to the Principles of the Treaty of Waitangi as expressed by the Courts and the Waitangi Tribunal. Te Puni Kōkiri 2001. Available at: <https://www.tpk.govt.nz/en/o-matou-mohiotanga/crownmaori-relations/he-tirohanga-o-kawa-ki-te-tiriti-o-waitangi>

<sup>52</sup> Treaty of Waitangi Act 1975. Available at: <https://www.legislation.govt.nz/act/public/1975/0114/latest/whole.html#DLM435375>

<sup>53</sup> Quality Planning Resource (n.d). Treaty of Waitangi Obligations. Available at: <https://qualityplanning.org.nz/node/705>

<sup>54</sup> Waste Minimisation Act 2008 No 89 (as at 24 September 2025), Public Act Contents – New Zealand Legislation. Available at: <https://www.legislation.govt.nz/act/public/2008/0089/latest/DLM999802.html>

<sup>55</sup> Section 10 of the WMA and the 2020 Gazette notice [General Guidelines for Product Stewardship Schemes for Priority Products Notice 2020 - 2020-g03342 | New Zealand Gazette](#)

- tyres
- electrical and electronic products (e-waste including large batteries)
- agrichemicals and their containers
- refrigerants and other synthetic greenhouse gases
- farm plastics.

At the time of writing, of the priority products, only tyres have an operational mandatory scheme. Refrigerants and farm plastics are operational on a voluntary basis while the regulations are being developed. Schemes are under various stages of development for the remainder of the priority products, with regulations currently being drafted for the 'rural recycling' PSS which expands on the existing voluntary approach<sup>56</sup>.

Notably, textiles is not one of the priority products.

In late December 2025 the Minister for the Environment published a proactive release of a Cabinet paper discussing proposed waste legislation amendments<sup>57</sup>. In this proactive release the minister proposed a number of changes, including replacing the existing product stewardship provisions with a new framework for EPR. The proposed framework is intended to:

- Remove requirement for accreditation of voluntary product stewardship and declarations of priority products
- Enable the appointment of suitable PROs and clarify delegated roles of the PROs and the Secretary for the Environment, including empowering PROs to set scheme charges
- Improve financial management and governance for effective monitoring and enforcement
- Make PROs responsible for the day-to-day operation of schemes, and the Minister for the Environment responsible for setting performance expectations via regulations.

If this proposed framework for a modernised EPR comes into effect, this will mean that textiles will no longer need to be declared a priority product in order to have an RPS put in place. It does, however, mean that a voluntary PSS is no longer an option.

## 2.3.2 Part 3: Waste Disposal Levy

The provision for the application of a waste disposal levy is made in Part 3 of the WMA. Table 2-2 shows the current and future levy rates.

**Table 2-2: Waste Disposal Levy Rates Cost per Tonne<sup>58</sup>**

Facility Class	Waste types	1 July 2025	1 July 2026	1 July 2027
Municipal landfill (class 1)	Mixed municipal wastes from residential, commercial and industrial sources	\$65	\$70	\$75

<sup>56</sup> [Product stewardship agrichemicals, containers and farm plastics regulations | Ministry for the Environment](#)

<sup>57</sup> Minister for the Environment (2025). Proactive-release-of-Cabinet-paper-for-waste-legislation-Ammdments. Available at: [Proactive-release-of-Cabinet-paper-for-waste-legislation-ammdments.pdf](#)

<sup>58</sup> Ministry for the Environment (2025). Waste disposal levy expansion. Available at: <https://environment.govt.nz/what-government-is-doing/areas-of-work/waste/waste-disposal-levy/expansion/>

Construction and demolition fill (class 2)	Accepts solid waste from construction and demolition activities, including rubble, plasterboard, timber, and other materials	\$35	\$40	\$45
Managed or controlled fill facility (class 3 and 4)	On or more of: <ul style="list-style-type: none"> <li>contaminated but non-hazardous soils and other inert materials (e.g., rubble)</li> <li>soils and other inert materials.</li> </ul>	\$15	\$15	\$20

The waste disposal levy is intended to discourage disposal while also creating a fund to support the development of diversion options for a range of materials (such as textiles) for which alternative management pathways exist.

Funds from the application of the levy are currently hypothecated. Half of levy revenue is paid out to local authorities to be applied for the purposes of waste minimisation in accordance with their waste management and minimisation plans (see 2.3.3 below). Historically, the majority of the remaining levy has gone into the Waste Minimisation Fund (WMF), which provides the pathway to support the development of landfill diversion options that meet the current operative criteria of the fund<sup>59</sup>. Since 2024, the portion of levy revenue retained by Government has been available for a wider range of activities than previously; to include restoration of freshwater catchments, clean-up of contaminated sites and closed landfills and management of emergency waste<sup>60</sup>, alongside the WMF.

Current WMF funding is focused on the diversion of organic waste from landfills.<sup>61</sup> Projects must be of a discrete timeframe and, generally speaking, supporting funding from other sources is required. Funding to support the development of product stewardship schemes has been provided in the past, and so this is a potential source of support for the development of a textiles product stewardship scheme as long as it meets the overall priority/ies set for the WMF at the time.

## 2.3.3 Part 4: Responsibilities of Territorial Authorities

Under this part of the legislation, territorial authorities have a responsibility to 'promote effective and efficient waste management and minimisation' in their district. A key responsibility is that they must have an operative waste management and minimisation plan that sets out how they will meet their obligations in relation to waste management and minimisation. While territorial authorities are not required to be providers of (or contract out) waste management services, they are required to ensure that appropriate facilities and services are available. Territorial authorities or their contractors are likely to be key agents in the implementation of collection and drop-off facilities for any PSS, including one for textiles.

<sup>59</sup> Gazette (2024). Criteria for the Waste Minimisation Fund. Available: <https://gazette.govt.nz/notice/id/2024-go4618>

<sup>60</sup> Beehive.govt.nz (2024). Waste levy changes to improve environment. Available at: <https://www.beehive.govt.nz/release/waste-levy-changes-improve-environment>

<sup>61</sup> Ministry for the Environment (2025). Waste Minimisation Fund. Available at: <https://environment.govt.nz/what-you-can-do/funding/waste-minimisation-fund/#what-is-being-funded>

## 2.4 Implications of EU EPR for New Zealand Exports

The revised Waste Framework Directive (Directive 2008/98/EC) introduces harmonised EPR requirements for textiles and footwear across all EU member states. Under these rules, every producer, whether manufacturing within the EU or selling via e-commerce from outside, must register with a national PRO, report volumes by product type (e.g., clothing, accessories, home linens, curtains, and optionally mattresses), and cover the costs of collection, sorting, reuse and recycling of end-of-life textiles. Member states have 20 months to transpose the Directive into national law, and must establish fully operational EPR schemes within 30 months of its entry into force (which will be 2028), with micro-enterprises granted a further 12-month transition. A core innovation is eco-modulated producer fees, which reward durable, repairable and recyclable designs and penalise fast-fashion business models, while the forthcoming Digital Product Passport under the Eco-design for Sustainable Products Regulation will supply interoperable product data to streamline reporting and support fee differentiation.

New Zealand's 2024 Free Trade Agreement (FTA) with the EU links market access to credible climate action and sustainability standards, signalling that Aotearoa New Zealand's textile sector may soon face similar EPR and eco-design obligations. By proactively aligning with these emerging EU frameworks, Aotearoa New Zealand producers can mitigate future non-tariff barriers, boost competitiveness in European markets, and accelerate the transition to a domestic circular economy that meets both international trade commitments and national waste-reduction targets.

## 2.5 Stakeholder Viewpoints

Stakeholder engagement was undertaken through a series of workshops, a survey, and one-to-one interviews. The engagement focused on potential PSS design parameters, perspectives on textile production, consumer experience, reuse, and recovery in Aotearoa New Zealand. Stakeholders across the supply chain were canvassed; including local manufacturers, major retail brands, charitable reuse organisations and textile recycling innovators. The engagement was designed to capture a diverse range of insights into current practices, key challenges and opportunities, with a focus on the implications of a potential RPS scheme for textiles in the Aotearoa New Zealand context.

The following section presents a synthesised summary across the stakeholders, highlighting the key issues raised, highlights, and common themes for consideration as part of a textiles RPS.

### Infrastructure

A consistent theme that occurred across all stakeholder groups is the lack of available infrastructure for textile recovery in Aotearoa New Zealand. From manufacturers and retailers to recyclers and reuse charities, all stakeholders stressed that without an active and direct approach to improving infrastructure, even a well-designed RPS would not be as effective. An RPS/EPR would help to address this gap by providing a funding source for infrastructure and day-to-day operations; however, additional work is likely to be required to clearly define the infrastructure gaps and identify the best options to address these.

Multiple stakeholders mentioned that previous initiatives in Aotearoa New Zealand and Australia have failed altogether, or struggled to increase scale - reverting to either small operations or warehousing stockpiles rather than generating new outputs - because of the lack of downstream processing infrastructure available at scale. UsedFULLY noted that they can convert waste into high-value industrial products, however, several constraints delayed the initial rollout of the technology and processed quantities so far remain relatively small. Other stakeholders noted similar problems with wanting to increase outputs but having a lack of available scalable infrastructure to achieve this.

Retailers mentioned that if they wanted to explore fibre to fibre (F2F) recycling options, overseas markets are the only ones producing this kind of output at this stage. Exporting results in less visibility and control over the 'waste' textiles while at the same time increasing costs and emissions. The message is clear – for an RPS for textiles to be successful, at least some of the fees should be hypothecated to build and support local infrastructure and recycling capacity, supported by a clear gap analysis and development strategy.

### **Consumer behaviour**

Another message that prevailed through all the engagement is that consumer behaviour is a significant contribution to high textile waste volumes, and a significant barrier to more sustainable solutions. Multiple organisations highlighted the gap between what consumers say they will do in terms of achieving sustainable outcomes, and what they actually do. One second hand organisation sees this daily in stores, where large volumes of donations arrive but only 20–30 per cent are resalable, with the rest ending up in landfill because customers simply will not buy them. One stakeholder also noted that while their repair services are valued by some, demand is limited compared to consumer preference for new products. This mismatch suggests that behaviour change cannot be assumed, and that education and awareness programmes would need to go hand in hand with regulation if consumer actions are to shift meaningfully.

### **Compliance burden**

There is also a risk of disadvantaging smaller players if the scheme is not well designed to combat this. Compliance-heavy schemes could unintentionally reward larger corporates that have the resources to secure certifications and absorb reporting costs; this may already be a requirement for them due to other regulation or company policies. Smaller manufacturers could be left behind as they don't have the internal resources or wider company requirements. One stakeholder suggested that a revenue-based levy model administered by a third party to spread costs more evenly and reduce opportunities for 'gaming the system' should be implemented. This perspective reinforces the need for an RPS design that ensures fairness and does not create unnecessary barriers to participation for SMEs or niche innovators.

### **Sorting and waste disposal costs**

Another key barrier that was highlighted is the cost of logistics and disposal of waste textiles, with rising waste management fees and the cost for ethical sorting and processing increasing. An additional key challenge raised around cost is that disposing of textiles to landfill is cheaper than any recycling currently accessible in Aotearoa New Zealand. With donated and second-hand textiles being of variable quality, the sorting costs can be high. This restricts recycling businesses in what they can economically take and is a major cost contributor to the charitable sectors that accept all levels of donations. This underscores the importance of designing a system that supports local solutions and discourages the use of landfill as an outlet for excess textiles.

### **Opportunities**

Through these challenges, the stakeholders also identified clear opportunities that an RPS for textiles could bring to the Aotearoa New Zealand market. UsedFULLY's model demonstrates that textiles can be transformed into high-value industrial inputs such as adhesives, paints, and roading materials; displacing imported virgin materials and contributing to economic resilience. A retailer's second-hand business, although small, has created jobs and modest profitability; showing that resale and reuse can be commercially viable when integrated into the brand. Together, these examples highlight that there are real business and employment opportunities in reuse, repair, and recycling industries; but scaling them and making them the 'norm' will require supportive infrastructure and coordinated investment planning.

## Te ao Māori participation<sup>62</sup>

*“In te ao Māori, resources are not merely material assets to be used or owned—they are living elements of Te Taiao, interconnected and imbued with whakapapa, embodying relationships and responsibilities that sustain the balance of all life” – Rautāpatu Foundation.*

In addition to wider stakeholder engagement, a dedicated session was held aimed at understanding te ao Māori perspectives and issues and the alignment between te ao Māori values and the principal outcomes of a textiles RPS in Aotearoa New Zealand. As discussed earlier in section 2.2, a mātauranga Māori approach to waste management shares a lot in common with circular economy concepts, including product stewardship approaches which enable kaitiakitanga (guardianship), the practice of protecting resources and showing respect and kinship for the environment.

Māori participants therefore saw a valuable opportunity to embed mātauranga (Māori knowledge) within the design of any future textiles RPS scheme. The acknowledgement and acceptance of mātauranga concepts in RPS also comes with the responsibility to ensure opportunities for meaningful participation for mana whenua. This would need to be embedded in governance structures and spaces, so the voices of mana whenua, in particular rangatahi (younger generation), could inform and drive a thoughtful systems change.

Key themes that emerged in the consideration of te ao Māori included the following:

If RPS is implemented as part of a thoughtful systems change effort, there could be positive impacts such as:

- Opportunities for economic empowerment through sustainable industry development grounded in Māori values and governance;
- An RPS approach that recognises mātauranga Māori and how it can sit alongside concepts of business growth and new employment in a way that provides opportunities for enhanced community wellbeing and environmental regeneration activities;
- Revitalisation and transmission of traditional fibre knowledge integrated with modern technological advances;
- Enhanced community wellbeing through new employment, business growth, and environmental regeneration activities; and
- Support for environmental stewardship that strengthens whakapapa relationships with whenua (land), wai (water), and taonga (property, treasures).

An example of how RPS could be used to explicitly support mātauranga Māori would be to encourage the use of indigenous fibre industries as vital parts of textile stewardship. This could see Māori kaitiaki (guardians) support the revitalisation of harakeke (flax) and other indigenous fibres as pathways for valuable economic and cultural development rooted in whakapapa (history, lineage). Another possible benefit of embedding mātauranga, tautōhito (experience, skill) and pūrākau (traditional storytelling) and their learnings into circular economy innovation is the creation of unique products and marketing that centre te ao Māori on a global stage.

However, if an RPS is solely a policy and economic lever, then there could be negative impacts such as:

- The risk that Māori participation will be further marginalised, perpetuating inequity, if provision is not made for genuine participation in governance.

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<sup>62</sup> This section of the report was drafted in collaboration with the Textiles Advisory Group (TAG)

- Administrative-heavy or very commercially-focused implementation that risks undermining access, implementation and buy-in.
- Administrative and financial burdens that could disproportionately affect smaller enterprises, which would include many Māori enterprises.
- The legacy and ongoing impacts of waste infrastructure being disproportionately located in/or affecting Māori communities, requiring proactive redress.

### **Summary of engagement**

Overall, there is widespread agreement that for RPS to work it must be carefully designed to avoid unintended negative consequences. Stakeholders want to see funds reinvested into infrastructure, R&D, and practical recycling solutions rather than being absorbed by compliance or administration. They stressed that poor design risks creating perverse outcomes such as stockpiling, cost burdens falling disproportionately on smaller players, or greenwashing by larger companies. A successful scheme would ensure fair cost-sharing, build local processing capacity, foster collaboration between brands, recyclers, and charities, and include consumer education to align behaviour with sustainability goals. The mana whenua workshop highlighted the unique opportunity to embed matauranga Māori into the RPS design to support these sustainability and cultural goals.

# 3.0 Textiles Lifecycle and the Regulated Product Stewardship Scenario Modelled

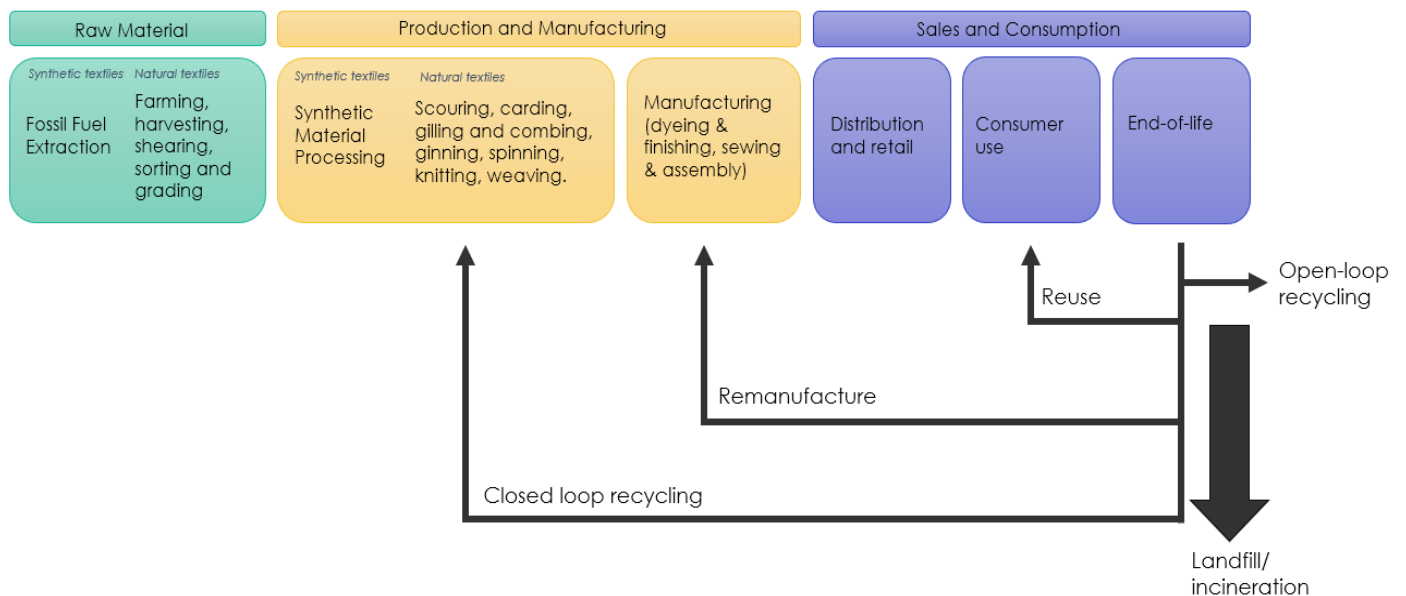
This section sets out the structure and assumptions behind the RPS scenarios modelled, beginning by mapping the key stages of a textile's lifecycle, from raw-material extraction and manufacturing through use and end-of-life management, and then examining the suite of environmental, social, animal-welfare and financial impacts that arise.

Building on this foundation, we introduce two contrasting ambition pathways - the low and high ambition scenarios - and explore the boundaries of each scenario.

## 3.1 Textile Lifecycle

The textiles lifecycle consists of six major stages, illustrated in Figure 3-1.

**Figure 3-1: The Lifecycle of Textiles**



Source: Based on Textile Value Chain (2019)<sup>63</sup>, amendments by Eunomia Research & Consulting

The processes for natural and synthetic textiles differ at the raw material production stage (which encompasses the first two stages in the diagram). The processes for natural textiles in these two stages are in red text, and those for synthetic textiles are in black text.

<sup>63</sup> Textile Value Chain (2019). Lifecycle Analysis of Textiles. Available at: <https://textilevaluechain.in/in-depth-analysis/articles/textile-articles/%C2%AClife-cycle-analysis-of-textiles>

## 3.2 The Impacts of the Textile Lifecycle

Textile production has wide-ranging impacts across its lifecycle, which vary significantly depending on the fibre type – for example, whether it's a natural fibre, synthetic fibre, or a blend of both. These impacts and more are summarised in Table 3-1.

**Table 3-1: Impact Categories Across the Textile's Lifecycle**

Impact Category	The Impacts of Natural Fibres (i.e., cotton and wool)	The Impacts of Synthetic Fibres (i.e., polyester and nylon)
Environmental	<ul style="list-style-type: none"> <li>• High water consumption</li> <li>• Biodiversity loss</li> <li>• Soil degradation.</li> <li>• Generally biodegradable (unless chemically treated)</li> </ul>	<ul style="list-style-type: none"> <li>• Derived from fossil fuels</li> <li>• Contributing to GHG emissions</li> <li>• Microplastic pollution during washing and wear</li> <li>• Non-biodegradable, often contributing to landfill waste</li> </ul>
<ul style="list-style-type: none"> <li>• Water pollution and air pollution are common across both fibre types, though sources differ.</li> </ul>		
Social	<ul style="list-style-type: none"> <li>• Risk of labour exploitation and modern slavery.</li> <li>• Social inequality and job loss as a result of offshoring can be exacerbated by globalised production models.</li> </ul>	
Animal	<ul style="list-style-type: none"> <li>• Concerns around animal treatment and sourcing practices.</li> </ul>	<ul style="list-style-type: none"> <li>• Microplastics ingested by marine and terrestrial animals</li> </ul>
Financial	<ul style="list-style-type: none"> <li>• Higher land and water-related costs.</li> <li>• Local production may be more expensive.</li> </ul>	<ul style="list-style-type: none"> <li>• Lower upfront costs but price volatility due to oil markets.</li> <li>• Outsourcing may reduce costs but increase social risks</li> </ul>

Whilst the majority of these impacts are realised on a global scale, many of them still apply in the Aotearoa New Zealand context.

## 3.3 Scenarios Modelled

Two RPS scenarios were modelled: a low ambition scenario and a high ambition scenario. The product scope and obligated parties remain consistent across the two scenarios.

The products in scope for both scenarios are shown in Table 3-2.

**Table 3-2. Product scope**

Items	
Includes	Clothing textiles (household and corporate), household linens, and corporate textiles (e.g. hotel/restaurant fabrics uniforms etc).
Excluded	Duvets, mattresses, pillows, curtains, carpet, footwear.

For the purposes of this study, Eunomia proposes that brand owners who are obligated are defined as the organisation that designs, specifies or selects products, and thereby is in the best place to influence those placed on the market.

It was requested that variations of these policy measures be developed to compare differences in the level of impacts and costs. As such, a low ambition and a high ambition scenario were developed.

Both the low and high ambition scenarios include targets relating to the following stages:

- Reduction;
- Collection;
- Sorting and reuse / preparing for reuse; and
- Recycling.

Table 3-3 summarises the aspects covered by each scenario, including the differences between the low and high ambition scenarios.

**Table 3-3. Overall Elements Covered by Low and High Ambition Scenarios**

Factor	Low Ambition	High Ambition
<b>Performance Targets</b>	Modest performance targets	More rigorous and aspirational targets aimed at driving significant impact
<b>Cost Coverage</b>	Covers infrastructure costs aimed at expanding capacity for textile collection,	Covers infrastructure costs aimed at expanding capacity for textile collection, sorting and

	sorting and treatment	treatment with a broader and more comprehensive range of these costs than the low ambition option
<b>Waste Collection</b>	Covers waste collection costs, limited to drop-off sites, retailer returns, and donation points	Covers waste collection costs, including drop-off sites, retailer returns, donation points drop-off sites, retailer returns, and kerbside collection services
<b>Textile Reuse</b>	Supports the implementation of takeback schemes	Supports the implementation of takeback schemes and covers the cost of repair schemes that extend the lifespan of textiles
<b>Recycling and Disposal</b>	Both scenarios cover the costs associated with recycling and disposal.	
<b>Income</b>	Both scenarios include forecast income associated with	

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expanded recovered textiles  
markets.

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Communication efforts are also funded under both scenarios, though the scope differs; the low ambition scenario includes basic national campaigns and product labelling, while the high ambition scenario supports more advanced initiatives such as enhanced communication campaigns, eco-modulation labelling, and digital product passports (DPPs).

Finally, both scenarios cover management and administration costs, including reporting and compliance. The high ambition scenario additionally funds research and innovation related to textile product design and improvements in waste collection, sorting, and treatment.

Producer fees align with the EU and other markets on key criteria to amplify the impact. In the low ambition scenario, eco-modulated fees were based on durability, and in the high ambition scenario, this also includes environmental performance, including reparability verified through the use of ecolabels.

More detail can be found in Appendix A.2.0.

## 3.4 Baseline

Before modelling the two scenarios, it is necessary to develop the business-as-usual (BAU) or baseline scenario for comparison. This scenario models how the textiles situation is likely to evolve in the absence of further policy interventions. The historical data and the assumptions used in generating the projections can be found in Section A.3.0.

### 3.4.1 Baseline in 2024

Figure 3-2 summarises the 2024 textile mass flows, including end-of-life destinations. For the products within the scope of this study, only around 1% are estimated to be recycled in Aotearoa New Zealand, while 78% are landfilled. The mass flow assumptions for the production, consumption and export of the in-scope products, with further assumptions on the breakdown of disposal routes and final destination of textile waste in Aotearoa New Zealand, are detailed in section A.3.0.

**Figure 3-2: Diagram of Mass Textile Flows (2024)**

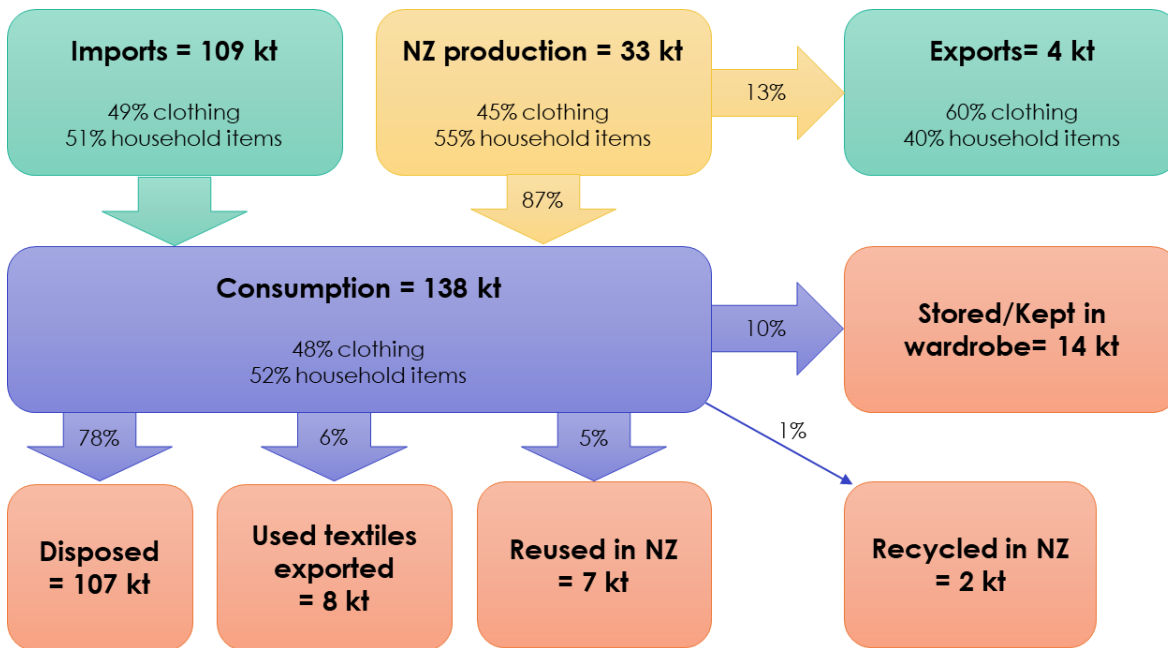
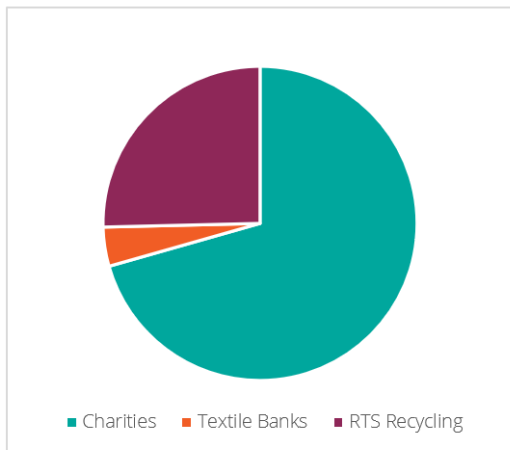
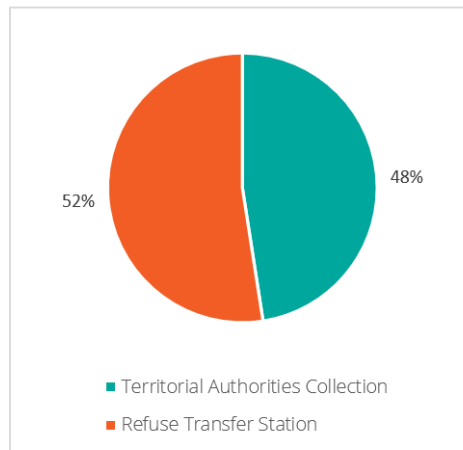


Figure 3-3 below show the breakdown of textile flows by collection method, focusing on residual waste and reuse and recycling, respectively. It is important to note that the disposal proportions are for TA-collected waste, excluding commercial residual collections, due to data limitations.

**Figure 3-3: Breakdown of Collection Methods for A) Reuse and Recycling Route and B) Residual Waste**



A) Breakdown of Collection Methods for Reuse and Recycling Routes



B) Breakdown of Collection Methods for Residual Waste (TA Collected Only)

### 3.4.2 Baseline in 2038

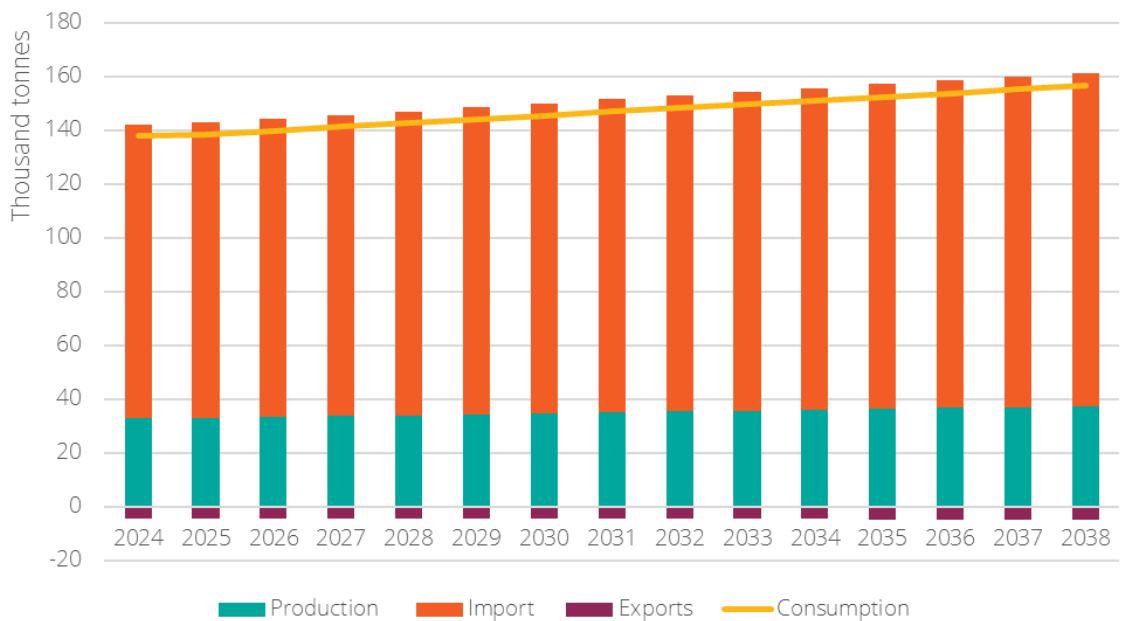
The baseline production, import, export and consumption of new textiles has been projected to 2038 by assuming that consumption of new textile items will mirror the projected population growth (see Section

A.3.0). This is shown in Figure 3-4. Exports are shown as negative as export quantities reduce the overall consumption of textiles.

The consumption of new textiles in Aotearoa New Zealand is projected to have a notable growth, with consumption in 2028 and 2038 being 3.46% and 13.52% higher than in 2024, respectively. However, consumption does not adequately capture the total quantity of garments made as a proportion of those that go unsold or do not make it to retail. In the UK, stakeholders estimated that some producers forecast 2-3% of stock produced will be unsold at the end of each season.<sup>64</sup>

Although consumption has been modelled in relation to population growth, historical trends suggest that per capita consumption has also risen, particularly due to the influence of super-fast fashion. Between 2000 and 2014, the number of garments purchased per person increased by approximately 60%<sup>65</sup>; and it is likely that this upward trend has continued in recent years. If per capita consumption continues to grow in the future, overall consumption will be higher than projected. As such, the current baseline should be viewed as a conservative estimate.

**Figure 3-4: Baseline Projection of Production, Import and Export**



<sup>64</sup> WRAP (2022). Textiles Policy CBA, Prepared by Eunomia Research and Consulting Ltd. Available at: <https://environment.govt.nz/what-you-can-do/funding/waste-minimisation-fund/#what-is-being-funded>

<sup>65</sup> Remy, N., Speelman, E., Swartz, S. (2016). Style that's sustainable: A new fast-fashion formula. McKinsey Sustainability. Available at: <https://www.mckinsey.com/capabilities/sustainability/our-insights/style-thats-sustainable-a-new-fast-fashion-formula#/>

# 4.0 The Costs and Benefits of Regulated Product Stewardship for Textiles

## 4.1 Overview

Table 4-1 summarises the modelled outcomes for key areas of the low and high ambition scenarios for the year 2038, with respect to the baseline scenario in the same year. These areas, and the impacts of the RPS on each, are discussed in more detail in the following sections of the report.

**Table 4-1: Summary of Costs (Red) and Benefits (Yellow) (2038)**

	Baseline	Low ambition scenario	High ambition scenario
RPS fee level (\$/t)	N/A	\$1,555.97	\$2,712.85
Price increase (excluding super-fast fashion)	N/A	1.8%	2.9%
Price increase (super-fast fashion)	N/A	7.1%	11.4%
Waste management and resource recovery costs (\$)	\$187 mil	\$213 mil (+14%)	\$262 mil (+40%)
Textile consumption (t)	156,481	134,119 (-14%)	119,982 (-23%)
Textiles reused or recycled (%)	6%	49% (+43%)	86% (+80%)
GHG emissions (t)	5,095,911	4,271,354 (-16%)	3,734,768 (-27%)
Water consumption (m <sup>3</sup> )	1,807,215,068	1,549,417,248 (-14%)	1,386,323,377 (-23%)
Number of jobs <sup>66</sup>	2,849	2,889 (+1%)	3,012 (+6%)
Revenue from recycled textile sales	N/A	\$1,031mil	\$1,561 mil

Figure 4-1 presents the net present value (NPV)<sup>67</sup> difference compared to the baseline over the 2028–2038 period. The figure considers:

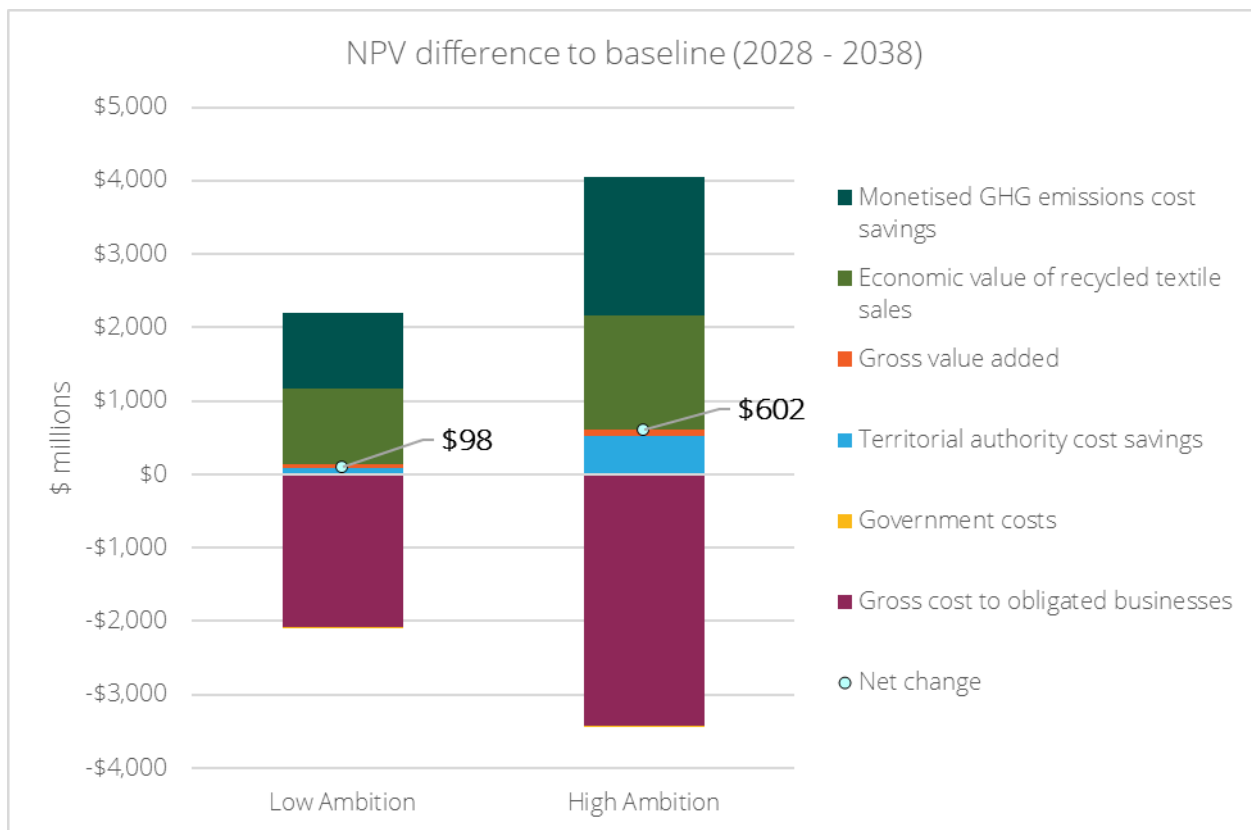
- Savings in greenhouse gas emissions (GHGE), monetised using Aotearoa New Zealand’s Treasury climate change impacts values for emissions valuation.

<sup>66</sup> Includes textile manufacturing and waste collection and management. Excludes fibre production and retail.

<sup>67</sup> Presenting figures as 'net present value' is a financial tool that enables the future benefit/cost of investment to be weighed against the immediate cost of the investment.

- Gross value added (GVA), which represents the economic benefit from the increase in domestic employment because of the RPS, primarily driven by new jobs in the reuse and waste management sectors.
- Waste management and resource recovery cost savings to local authorities and households from the transfer of these costs to businesses.
- Government costs for setting up, administering and enforcing the RPS.
- Gross costs to obligated businesses, which would be responsible for covering the end-of-life costs from textiles they place on the market, in line with the polluter pays principle.
- Income received from the sale of recycled textiles, forecast based on an assumed range of recovered textile types and the market value of potential end products.

**Figure 4-1: Scenario NPV Difference Compared to the Baseline (2028-2038)**



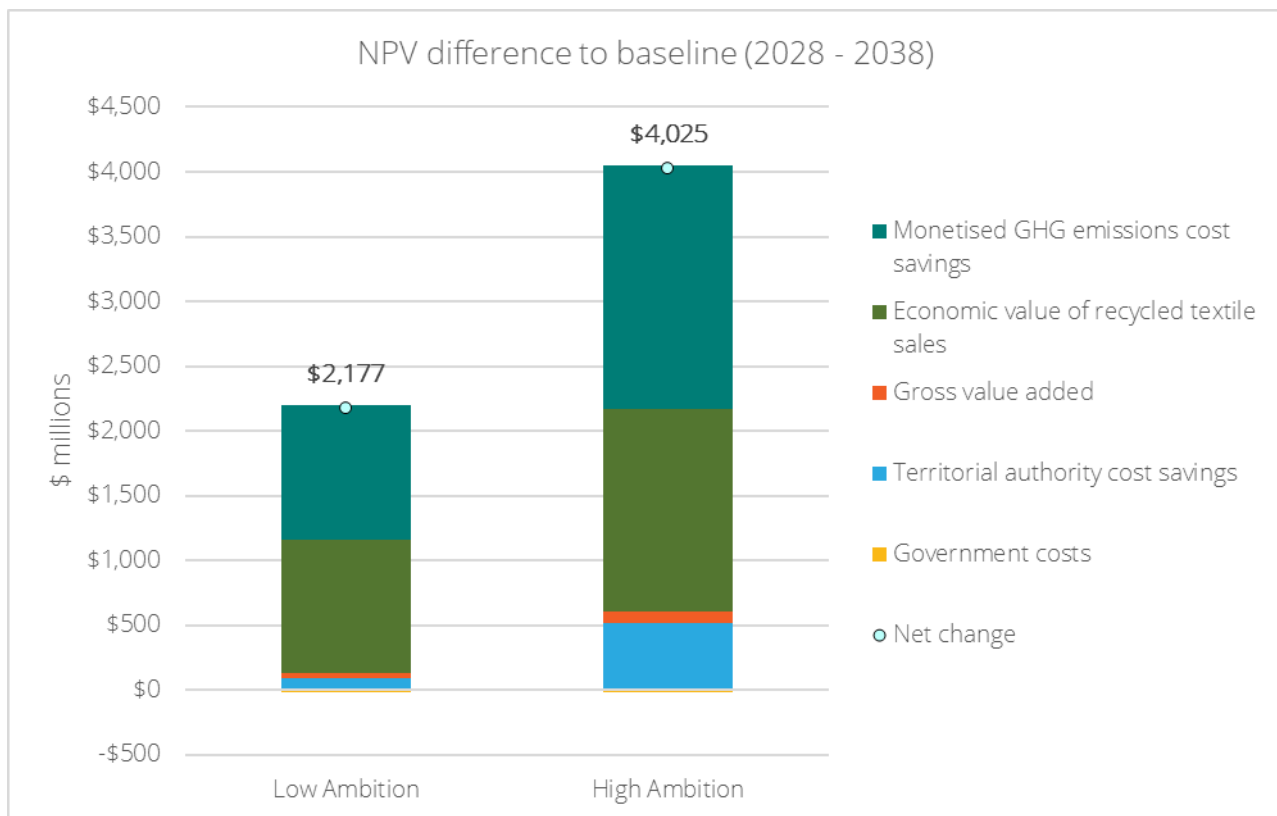
Both the low and high ambition EPR scenarios result in a net benefit compared to the baseline, and significant improvements achieved in waste management and environmental performance for the textile sector. The high ambition scenario incurs the greatest net benefit and reflects the most substantial gains in system efficiency and sustainability. It is important to highlight that, under the RPS scheme, the additional costs would not be borne by TAs or taxpayers; they would instead be covered by obligated businesses, in accordance with the 'polluter pays principle'.

It is also important to note, however, that the increased income from recycling and reprocessing the recovered textiles into products could reach just over \$1B in the low ambition scenario and up to \$1.56B in the high ambition scenario. These material revenue streams are normally taken into account in terms of the net charges paid by obligated businesses, thereby cutting the gross cost roughly in half.

Furthermore, a significant proportion of the business costs will also be passed on to the end consumer (the study assumed 50%), leaving businesses with a much lower figure than the gross figure indicated in Figure 4-1.

Figure 4-2 Figure presents the NPV difference compared to the baseline for both scenarios for the same period, excluding the costs to businesses. This figure highlights the substantial economic benefits to TAs, as the end-of-life waste management costs of textiles would be passed on to obligated businesses. It shows the revenue increase from the sale of recycled textiles, RPS would also offer new employment opportunities through the implementation of enhanced waste management, resource recovery and reuse systems, increasing the gross value added to the economy. In addition, it is projected that both scenarios would realise significant environmental improvements; as demonstrated by the large GHGE cost savings. Although both scenarios deliver substantial benefits, the high ambition scenario offers the most desirable outcomes, offering enhanced income and job creation, the largest savings for taxpayers, and the most prominent improvements in environmental performance (although this comes at a higher cost to obligated businesses).

**Figure 4-2: Scenario NPV Difference Compared to the Baseline Excluding Producer Costs (2028-2038)**



Additional environmental gains include more efficient water and land use, reduced resource consumption, and lower pollution levels (including from plastics and microplastics); but these (among other externalities) cannot be included in this model due to the lack of a robust monetisation method. These do, however, represent further positive outcomes of enhanced waste management and resource recovery practices and improved resource efficiency.

## 4.2 Costs

### 4.2.1 RPS Costs

It is important to recognise that RPS fees typically represent a transfer of costs away from citizens/taxpayers and towards producers/consumers. As noted above, however, the material revenue streams are normally taken into account in terms of the net charges paid by obligated businesses, thereby cutting their gross costs roughly in half. Furthermore, a significant proportion of the business costs will also be passed on to the end consumer, again reducing the net costs for the obligated businesses.

In addition, RPS schemes are typically accompanied by performance targets to drive improvement over time. Therefore, below we have made distinctions between the costs associated with the existence of the RPS scheme (for example, the scheme's administrative costs), and the costs that arise as a result of the improvements required to meet the performance targets. The reason for this is so that it is clear that the costs of meeting performance targets are not viewed as simply 'the costs of introducing and running the RPS'.

#### 4.2.1.1 RPS scheme administration and supporting instruments

The RPS scheme administration costs include transition costs to set up the scheme, operating costs to ensure the running of the scheme, as well as communication, compliance and enforcement costs. These costs represent 2% - 3% of the overall RPS fee, at around \$35 per tonne.

As part of the high ambition scenario, cost coverage also includes research and innovation funding and market development funding for used and low carbon materials. These costs have been assumed at approximately \$1.5 million per year, increasing the RPS fee by around \$12 per tonne for the high ambition option. Research and innovation funding and market development funding for used and low carbon materials are not present in the low ambition option.

#### 4.2.1.2 Improved waste management to meet targets

The costs of used textiles and textile waste management and resource recovery make up the majority of RPS fees, and are effectively a cost transfer; instead of being paid by taxpayers, costs are passed on to obligated businesses, and part of it eventually to consumers. This is in line with the 'polluter pays' principle, whereby those who produce the pollution (in this case, businesses that place textiles, which will ultimately become waste that needs to be managed appropriately, onto the market) are responsible for covering the costs of managing it to prevent damage to human health or the environment. It is also a fairer system for the taxpayers and consumers, as those who buy more textiles will indirectly pay more into the scheme through any costs passed on from the businesses to the consumers. Waste management and resource recovery costs include:

- Operational costs of managing and recycling textile waste; and
- Investment in capital infrastructure.

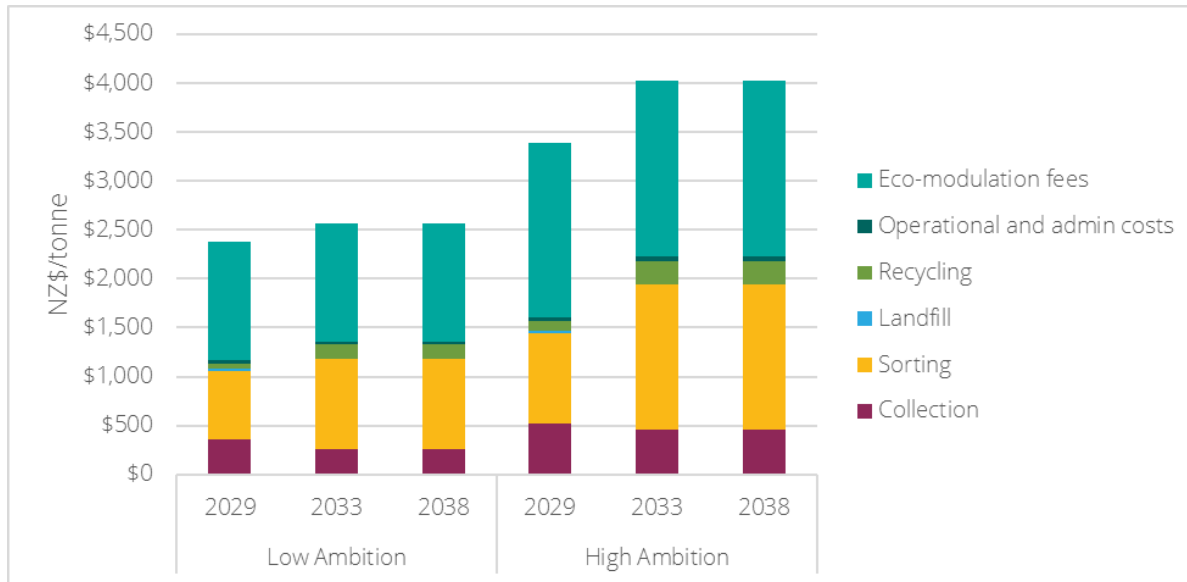
The cost coverage is lower in the low ambition scenario compared to the high ambition scenario, in line with the design described in Appendix A.3.0. The performance targets also affect the RPS costs, which are also different in the low ambition scenario compared to the high ambition scenario.

RPS fees should change every year and be calculated based on the tonnages placed on the market by producers and the used textile and textile waste management and resource recovery costs of the previous year.

### 4.2.1.3 Composition of RPS fees

Figure 4-3 below shows the composition of RPS fees in 2029, 2033 and 2038 for the low and high ambition scenarios.

**Figure 4-3: Composition of RPS Fees for the Low and High Ambition Scenario (2029, 2033 and 2038)<sup>68</sup>**



As shown in Figure the low and high ambition scenarios cover different activities within each scheme. The high ambition RPS scenario fees cover all recycling collections, and textile waste treatment, and disposal, but also investment in increasing the capacity and optimisation of these systems (e.g. supporting sorting and recycling infrastructure and improving access to collection systems). Under the high ambition scenario cost coverage includes numerous supporting initiatives for improved management of used and waste textiles (i.e. additional support for repair/ reuse, research & innovation and advanced consumer communications). In the low ambition scenario, the costs only cover collection via bring banks/ drop off points, sorting, recycling, and disposal, support for repair and reuse to a lesser extent, and simple national communications.

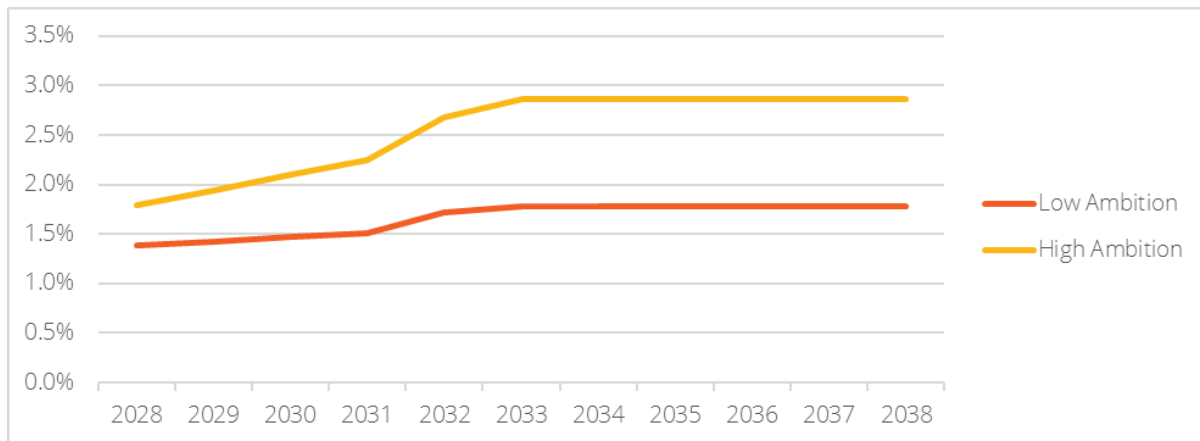
### 4.2.2 Consumer Prices

The costs described in Section 4.2.1 would both be borne by the obligated businesses, which will have the option of passing these costs to consumers. It was assumed that 50% of the cost would be passed on to the consumers in both the low and high ambition scenarios.

The price increase in percentage terms between 2028 and 2038 for both the low and high ambition scenarios is shown below in Figure 4-4.

<sup>68</sup> Note: the proportion of the fee that corresponds to landfilling is very small and therefore not clearly visible in the figure.

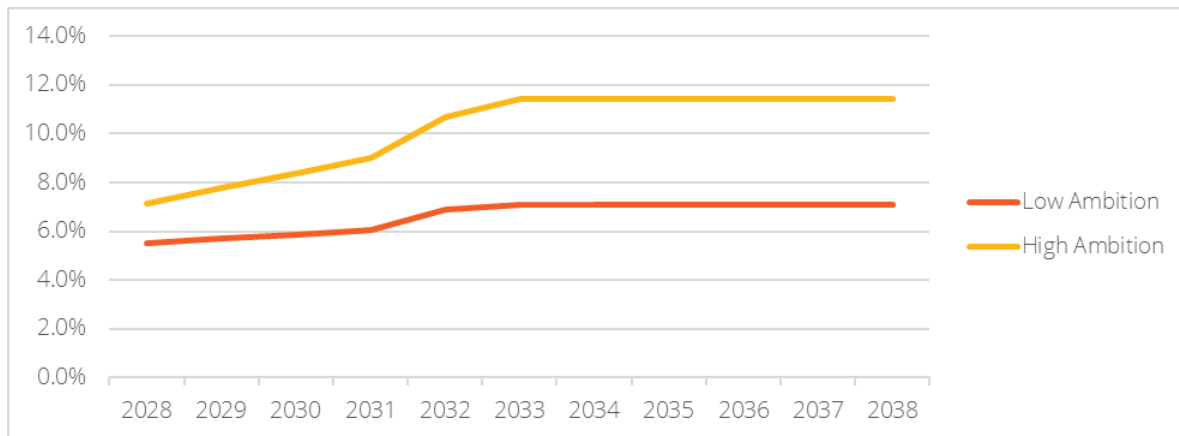
**Figure 4-4: Textile Price Increase per Year for the Low and High Ambition Scenarios (2028-2038)**



It is worth noting that the increase in price does not necessarily mean that consumers will pay, for example, an extra 2% a year for clothing. Supporting measures can bring increased durability standards, meaning that items should last longer, facilitating more uses over their lifetime. Ultimately, consumer purchasing and behaviour will be the key factor in terms of the impact of any cost increases for products.

Due to super-fast fashion products having a lower initial cost, the RPS cost passed on to the consumers would increase the price of super-fast fashion textiles between 5-8% for the low ambition scenario and between 7-12% for the high ambition scenario. This is shown in Figure 4-5. As super-fast fashion textiles were modelled to have a higher demand elasticity (see Section A.3.0), consumption of these textiles will decrease at a higher rate than for regular fashion textiles.

**Figure 4-5: Textile Price Increase for Super-Fast Fashion per Year for the Low and High Ambition Scenarios (2028-2038)**

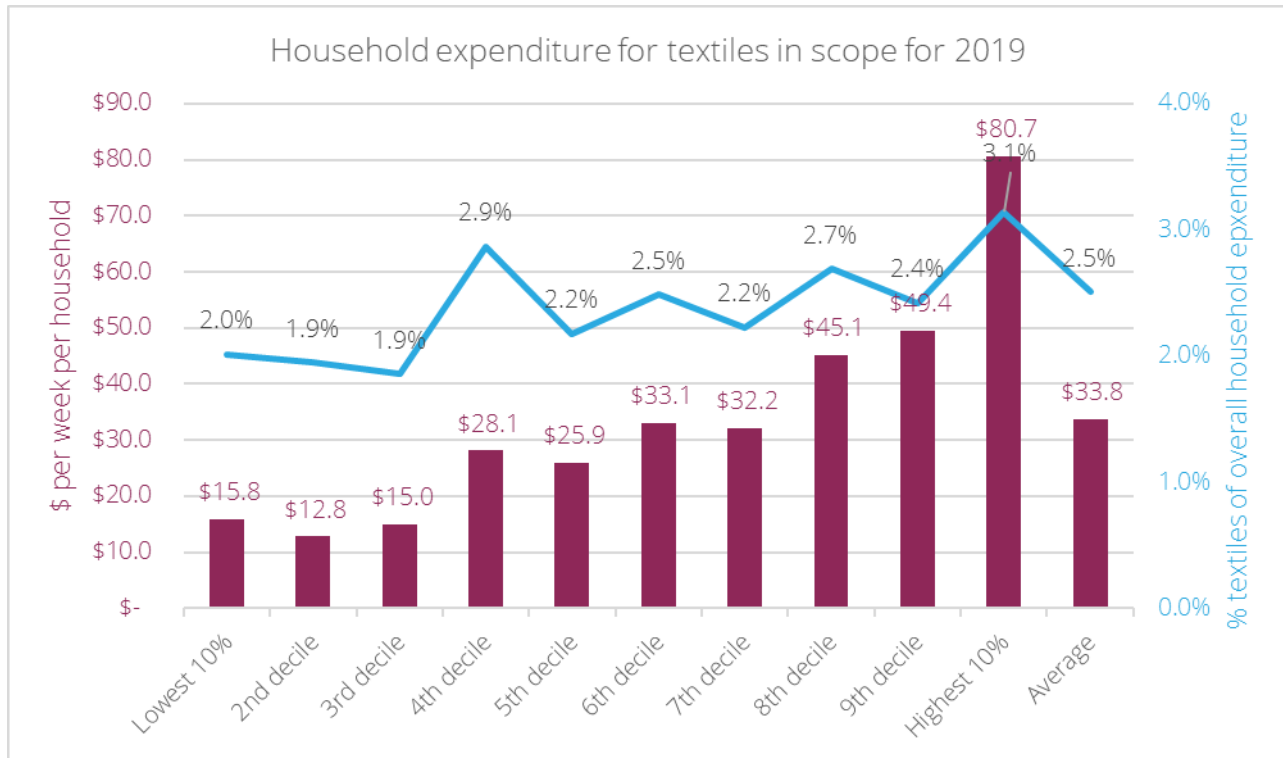


Eco-modulation of fees is also likely to have a greater impact on super-fast fashion than regular fashion (which is likely to be less durable and recyclable for example), increasing the costs of fast fashion further and providing a further disincentive for low-quality, short-lived products.

## Distributional impacts

Data from Aotearoa Data Explorer<sup>69</sup> shows that in 2019 the average household expenditure on textiles was \$33.80 per week, presenting 2.51% of a total expenditure of \$1,348.70 per week. Figure 4-6 shows the expenditure distribution according to the income deciles, ranging from \$15.80 per week for the lowest 10% to \$80.70 per week for the highest 10%.

**Figure 4-6: Household Expenditure on Textiles in Scope (2019)**



As previously described, RPS acts to shift the costs from taxpayers to producers/consumers. These costs are thus ultimately visited on consumers in proportion to the extent they consume, which would allow for a fairer distribution, with those that consume more paying more. Therefore, the extra costs to consumers through the RPS scheme will be allocated to consumers by decile in proportion to the amount that they spend. Under the current situation, without RPS, taxpayers are effectively providing an implicit subsidy to consumers, with those consuming the most receiving the greatest absolute subsidy in terms of end-of-life costs that are not incorporated into the price that they pay.

Importantly, the data shown in Figure represents averages for each decile, so there would be greater disparities when looking at individual cases.

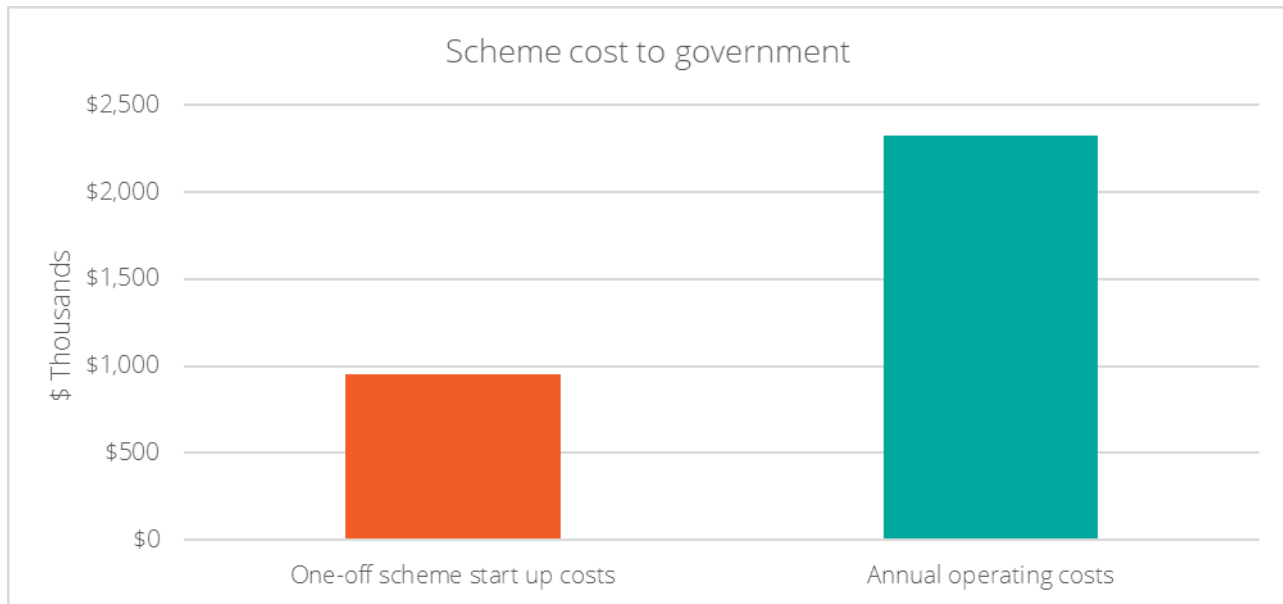
## 4.2.3 Government Costs

An RPS for textiles would involve administrative costs that would be borne by the government in Aotearoa New Zealand, including transition costs for setting up the scheme as well as IT systems, operations, compliance and enforcement, and staff costs. As shown in Figure 4-7 it is estimated that 'start-up' costs would be in the region of just under \$1 million, and the annual operating costs would be in

<sup>69</sup> Aotearoa Data Explorer (2019). Household expenditure for group and subgroup by household income group. Available at: [https://explore.data.stats.govt.nz/vis?fs%5b0%5d=Economy%2C0%7CHousing%23CAT\\_HOUSING%23&pg=0&fc=Economy&bp=true&snb=7&df%5bds%5d=ds-nsiws-disseminate&df%5bid%5d=HES\\_HES\\_003&df%5bag%5d=STATSNZ&df%5bvs%5d=1.0&dq=2019..05\\_2%2B03\\_1.&to%5bTIME%5d=false](https://explore.data.stats.govt.nz/vis?fs%5b0%5d=Economy%2C0%7CHousing%23CAT_HOUSING%23&pg=0&fc=Economy&bp=true&snb=7&df%5bds%5d=ds-nsiws-disseminate&df%5bid%5d=HES_HES_003&df%5bag%5d=STATSNZ&df%5bvs%5d=1.0&dq=2019..05_2%2B03_1.&to%5bTIME%5d=false)

the region of \$2.3 million. Due to a lack of Aotearoa New Zealand specific data, these cost estimates are based on figures derived from UK government data. It should be noted that, while these costs are currently modelled as costs to the Aotearoa New Zealand government, it is possible for the RPS scheme to take the responsibility of monitoring compliance and enforcement, and hence to pass these costs to businesses.

**Figure 4-7: Scheme Costs to Government**



## 4.3 Benefits

The projected increase in costs to obligated businesses and government spending come with substantial environmental, social and other economic benefits. This section outlines these benefits for both the low and high ambition scenarios, in comparison to the baseline, highlighting the broader value of investing in improved waste management and sustainability.

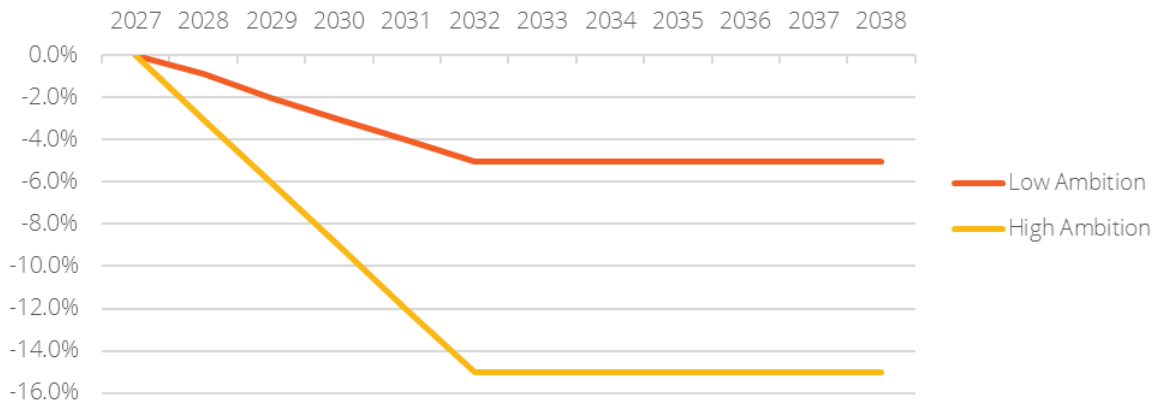
### 4.3.1 Textile Consumption and Waste

#### 4.3.1.1 Consumption reduction

The additional costs that the RPS scheme will place on obligated producers are expected to be partially passed on to the consumers, therefore leading to higher retail prices for textiles. An increase in consumer prices is expected to influence textile demand; when textiles become more expensive, consumer demand typically declines. This relationship between price and consumption is captured by the concept of 'price elasticity of demand' (PED).

Using the PED formula shown in Appendix A.3.0, the expected reduction in textile consumption resulting from price increases was estimated. The modelling results, presented in Figure 4-8, demonstrate how changes in price can influence consumption patterns and contribute to overall waste reduction.

**Figure 4-8: Changes in Textile Consumption for the Low and High Ambition Scenarios Compared to the 2027 Base Year (2028-2038)**



Alongside these price increases, the proposed scenarios could affect consumer purchasing behaviour in other meaningful ways. Both the low and high ambition scenarios include funding for consumer communication initiatives, such as awareness campaigns that highlight the environmental impact of the textile sector and promote the benefits of reuse and recycling.

Both scenarios also support reuse and repair activities, although the high ambition scenario goes further by introducing product labelling and digital product passports (DPPs). These tools can provide consumers with detailed product information, including guidance on the expected number of uses, helping to encourage more sustainable consumption habits.

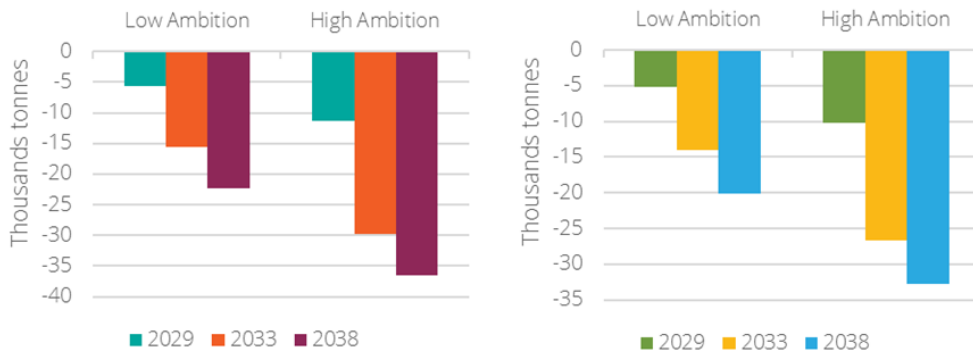
Together, these measures have the potential to reduce consumption through behavioural change, not solely through price signals, but by increasing awareness and promoting more responsible purchasing decisions.

### 4.3.1.2 Waste generation reduction

Consumption has a direct impact on waste generation; when consumption decreases, waste generation follows. In the baseline scenario, it is assumed that approximately 90% of the textiles consumed in a given year will eventually become waste. The remaining 10% is assumed to stay in circulation, either through informal reuse channels or retained by the original purchaser (e.g., kept in wardrobes).

As shown in Figure 4-9 greater reductions in consumption lead to proportionally greater reductions in waste. This highlights the strong correlation between consumption patterns and waste outcomes, reinforcing the importance of demand-side interventions in achieving environmental goals.

**Figure 4-9: Changes in Textile A) Consumption and B) Waste Generation in the Low and High Ambition Scenarios (2029, 2033 and 2038)**



A) Changes in Textile Consumption in the Low and High Ambition Scenarios (2029, 2033 and 2038)

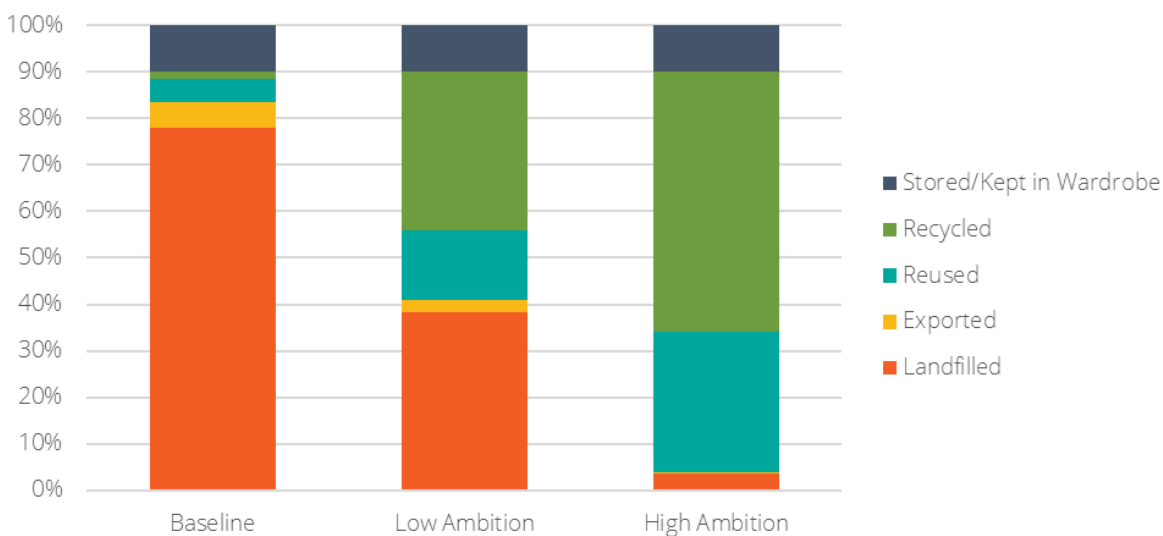
B) Changes in Textile Waste Generation in the Low and High Ambition Scenarios (2029, 2033 and 2038)

### 4.3.1.3 Improved used textile and textile waste management systems

Apart from a reduction in textile consumption and waste generation, the RPS scheme could drastically improve the management of textile waste. Figure 4-10 illustrates the projected final destinations of textiles in 2038 under the baseline and both RPS scenarios, assuming that the proportion of textiles retained in wardrobes remains constant at 10%.

Both RPS scenarios show a marked decline in the share of textiles sent to landfill. The diverted volumes lead to increased rates of reuse and recycling, with the high ambition scenario achieving the strongest performance. Additionally, the quantity of textiles exported decreases, driven by lower overall consumption and a greater emphasis on domestic reuse and recycling.

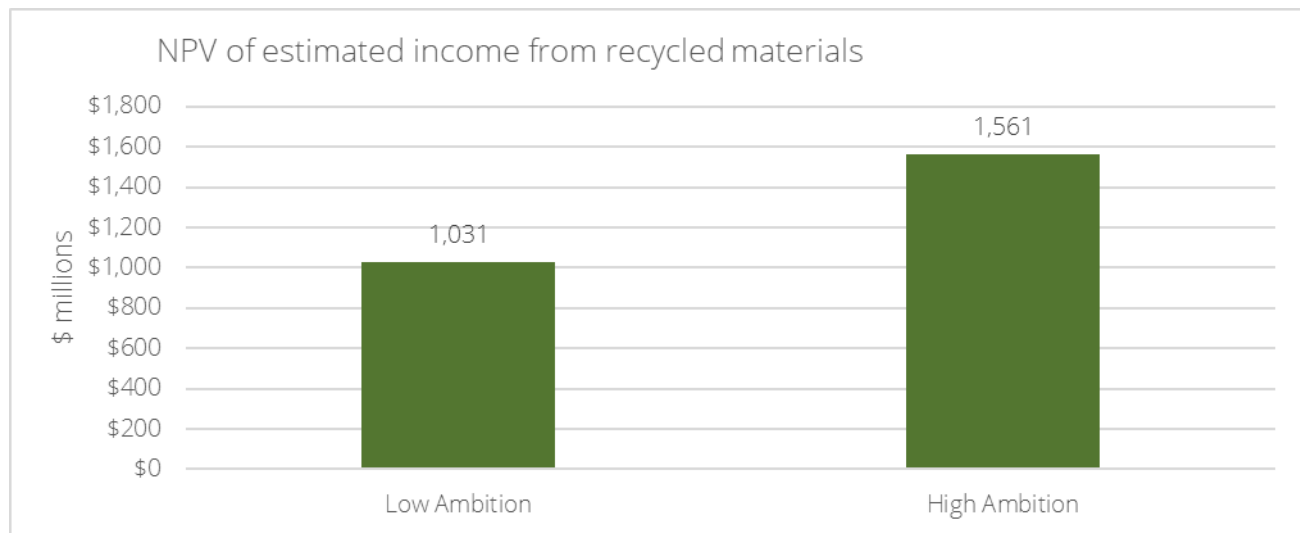
**Figure 4-10: Changes in Final Destinations of Used and Waste Textiles for Each Scenario (2038)**



## 4.3.2 Income from Recycled Materials

In both the low and high ambition RPS scenarios, recycling rates increase. This would increase the demand for sorted textiles not currently suitable for reuse, as the market will need to capture and recycle this material to meet performance targets. Sorters currently receive no revenue from the supply of sorted materials to recyclers, and therefore, no financial benefits are obtained from the sorting of textiles. However, in the future, as recycling infrastructure develops and demand for sorted material increases, income from sorted materials will increase and has been modelled based on industry data, shown in Appendix A.3.2.2.

**Figure 4-11 Scenario NPV Difference Compared to the Baseline (2028-2038)**



In the overall NPV difference compared to the baseline, an income of \$1,031mil of revenue would be created through the sales of recycled textiles in the low ambition scenario, and a \$1,561mil in the high ambition scenario.

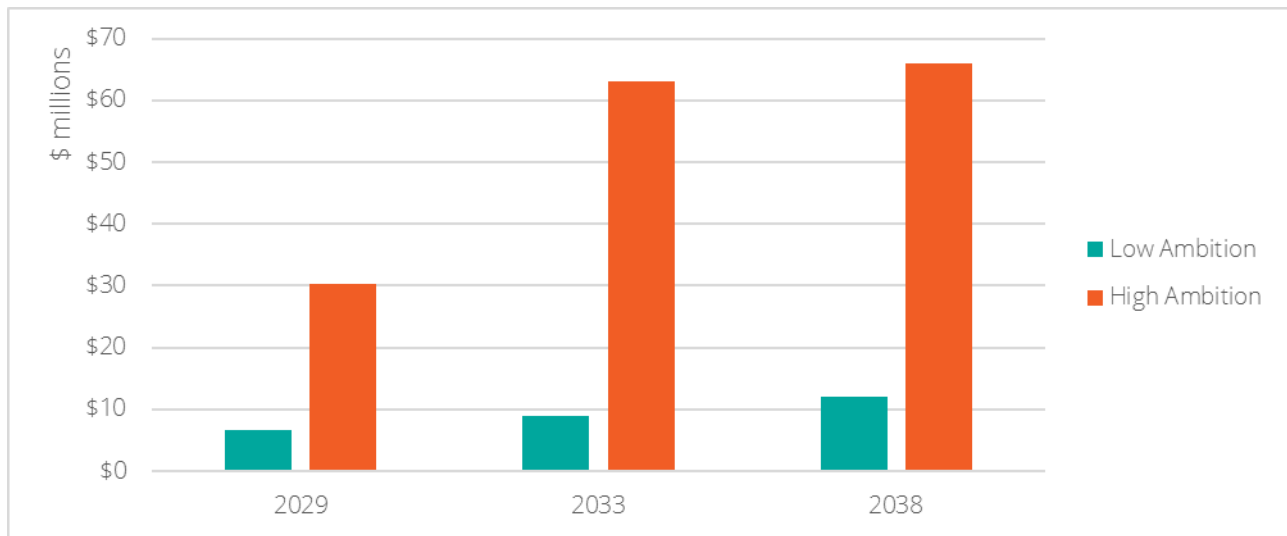
## 4.3.3 Territorial Authority and Household Savings

By shifting the costs of used textiles and textile waste management and resource recovery onto producers through RPS fees, significant cost savings are projected for both local authorities and households. In Aotearoa New Zealand, most households rely on TAs for waste collection services, which are funded through council funding mechanisms such as rates, uniform annual charges, or user-pays fees. However, in many regions private waste collection services also operate; in some cases these can even dominate the market.

This means that while TAs stand to benefit from reduced waste management and resource recovery costs, households using private collectors may also experience savings. For TAs, these savings could be redirected to other public services or used to ease the financial burden on council rate payers. For households with direct user charges, particularly those using private services, lower collection costs could translate into direct financial relief.

Figure 4-12 illustrates the projected waste management and resource recovery cost savings under both low ambition and high ambition scenarios, highlighting the broader economic benefits of implementing the RPS scheme to TAs and households.

**Figure 4-12: Waste Management and Resource Recovery Cost Savings (2029, 2033 and 2038)**



## 4.3.4 Environmental Benefits

### 4.3.4.1 Greenhouse Gas Savings

The GHG savings made across the textile lifecycle are shown in Figure 4-13. The figure shows that the greatest GHG savings are delivered through the decrease of imported textiles (shown as 'foreign production' on the figure). In total, between 2028 and 2038 6.0 million tonnes of CO<sub>2</sub>e are saved in the low ambition scenario and 10.8 million tonnes of CO<sub>2</sub>e are saved in the high ambition scenario, compared to the baseline.

Additional GHG savings are achieved through a reduction in domestic textile production and textile waste landfilling, due to the decrease in the consumption of textiles (as discussed in Section 4.3.1) and the notable increase in the reuse and recycling of textiles. While reductions in production contribute to savings, future scenarios could also include domestic textile manufacturing that leverages cleaner energy sources and shorter, more transparent supply chains.

**Figure 4-13: Changes in GHG Emissions (2029, 2033 and 2038)**

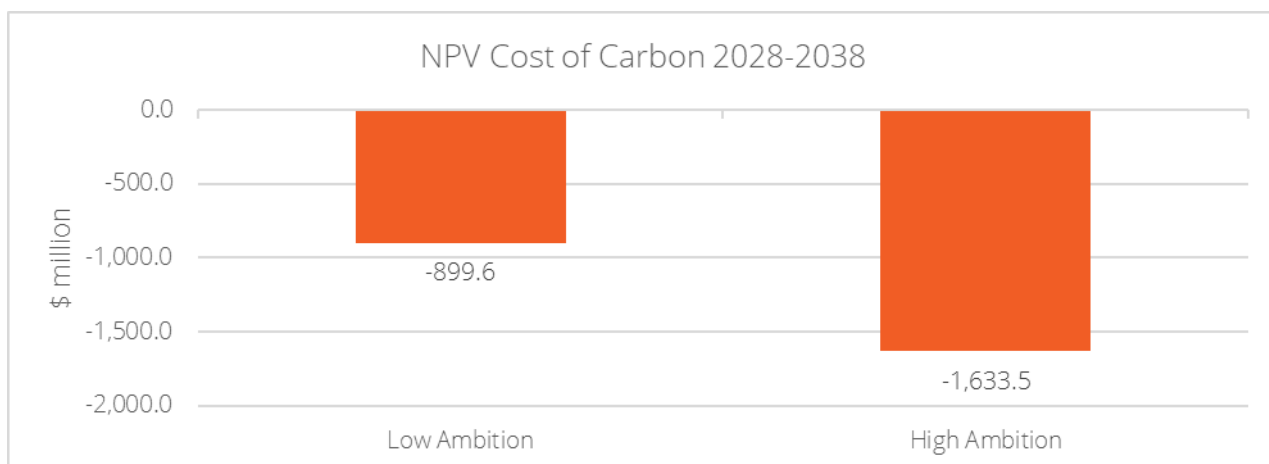


GHGE can be monetised using carbon pricing as outlined in Appendix A.3.0. Figure 4-14 presents the NPV of GHGE between 2028 and 2038, comparing the baseline with the low and high ambition RPS scenarios.

The modelling shows that the RPS scheme could deliver substantial economic benefits in terms of avoided carbon costs. Specifically, the estimated NPV of GHG emissions over the 2028–2038 period is nearly -\$900 million for the low ambition scenario and -\$1,634 million for the high ambition scenario.

In this context, a negative NPV represents a positive economic outcome. It indicates a reduction in future carbon-related costs compared to the baseline. In other words, the implementation of RPS leads to fewer emissions, which translates into lower societal costs associated with climate change, environmental degradation, and regulatory compliance. These avoided costs are a key indicator of the environmental and economic value of the proposed interventions.

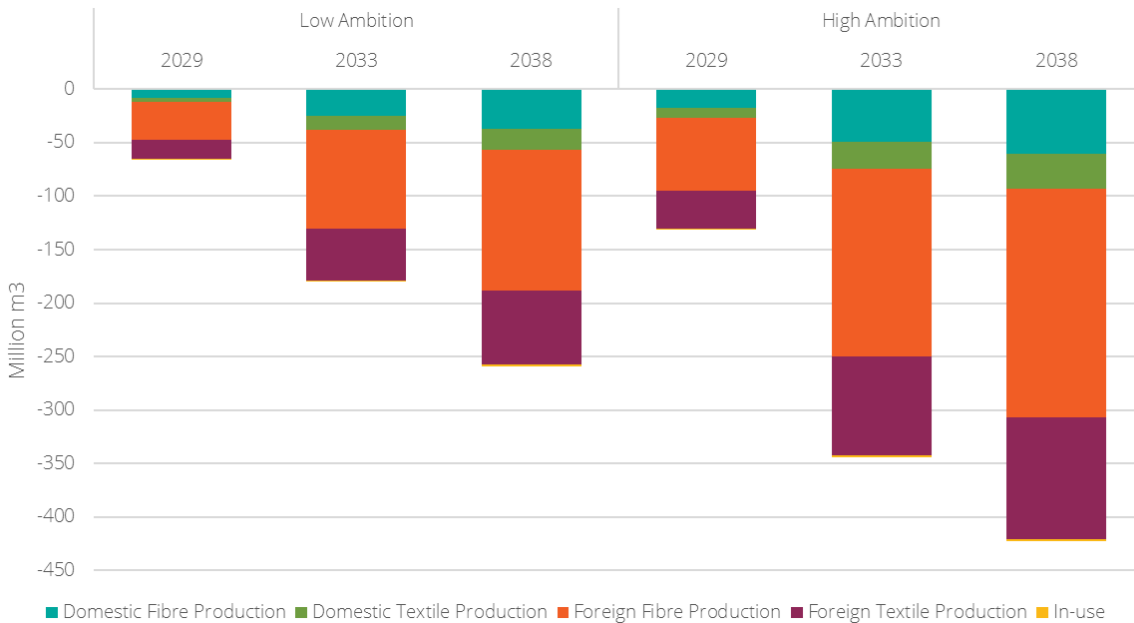
**Figure 4-14: NPV of Carbon Costs (2028-2038)**



### 4.3.4.2 Water usage savings

Figure 4-15 presents the water savings that could be attained by the low and high ambition scenarios. The modelled reductions in consumption lead to substantial water savings, with foreign fibre production presenting the greatest savings.

**Figure 4-15: Changes in Water Consumption (2029, 2033 and 2038)**



### 4.3.5 Employment

In pursuit of circularity, the scenarios proposed also have the goal of enabling increased domestic employment, as well as ensuring Aotearoa New Zealand's textile's sector's continued competitiveness in the global marketplace.

Figure 4-16 illustrates the overall projected employment impacts in Aotearoa New Zealand under both the low and high ambition RPS scenarios, as well as the baseline scenario. In both the low ambition and high ambition scenarios, we assume that production, consumption, and waste generation remain constant from 2032 onwards, once the RPS targets are achieved. This contrasts with the baseline scenario, where these metrics continue to grow year-on-year.

As a result, up to 2032, employment in the RPS scenarios increases relative to the baseline. This is because jobs in waste management (such as jobs in recycling, remanufacturing and preparation for reuse) grow more significantly than the decline in production-related jobs. After 2032, however, employment under the scenarios begins to decline relative to the baseline. Since the baseline assumes continued growth in production and waste tonnages, associated employment continues to rise. In contrast, employment in both scenarios remains flat due to the assumption of constant textile consumption and waste generation levels.

**Figure 4-16: Impact on Aotearoa New Zealand Employment (2029, 2033 and 2038)**

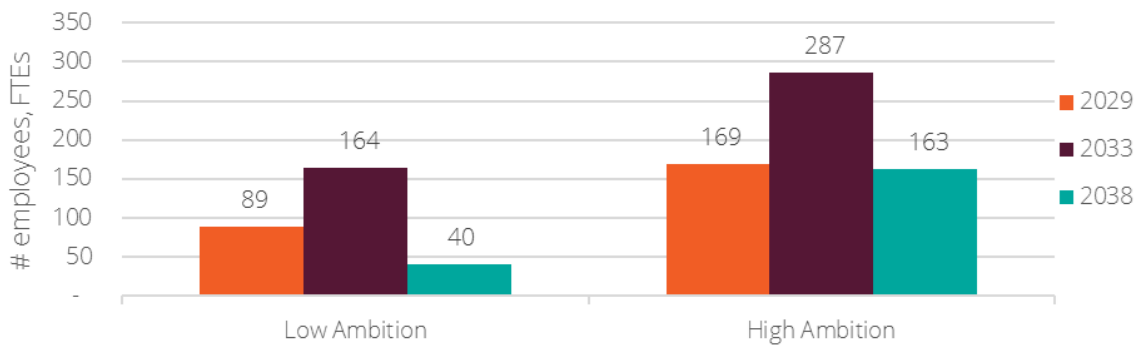
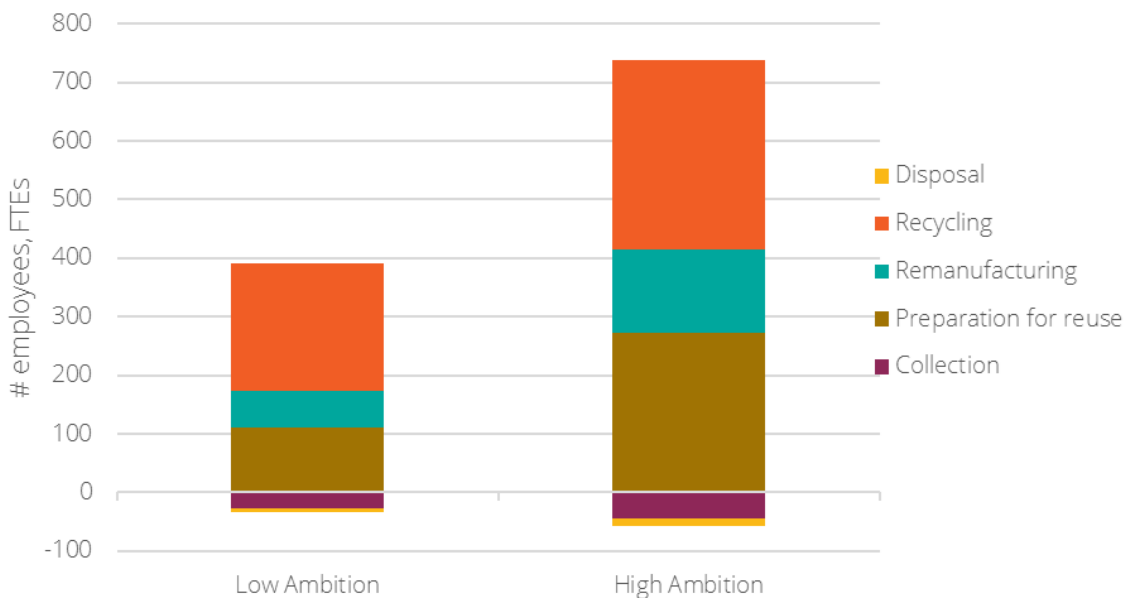


Figure 4-17 shows the projected changes in the domestic waste management sector by 2038 compared to the baseline under the low and high ambition RPS scenarios. The high ambition scenario delivers significantly greater job creation across recycling, remanufacturing, and reuse activities compared to the low ambition scenario and the baseline.

It should be noted that, as there are waste and consumption reduction targets in both RPS scenarios, manufacturing jobs decline relative to the baseline. In contrast, jobs in the waste management sector increase (such as jobs in recycling, remanufacturing and preparation for reuse). As a result, the net job figures in the graphic above, which includes manufacturing, are lower than the waste management-specific job numbers shown in the graphic below.

**Figure 4-17: Changes in Domestic Employment (2038)**



While unable to be modelled due to a lack of data, there is additional employment that will likely be created through:

1. Technology design and implementation: the T2T recycling industry is in an emergent state requiring significant research & innovation to scale technologies.

2. Training and skills development: the transition from current linear systems to a circular textiles industry will need to be supported by efforts in training and upskilling. This will be particularly important with product design, in order to meet eco-design requirements, and within the used and waste textiles industry. It is also important to highlight that the jobs associated with these skills will be in significant demand to ensure actors can meet policy requirements. This could have a positive impact in terms of the salary paid to these employees. Employment generated includes higher-paid roles, such as technology-focused positions involved in developing digital platforms that enable shared-economy activities<sup>70</sup>.
3. Repair services: there is the potential for increased employment in repair services to ensure access for consumers in areas that lack them.
4. Eco-design and labelling requirements: the implementation of eco-design & labelling requirements, as well as standards such as for the export of textiles for reuse and recycling, will require associated due diligence and enforcement systems to be implemented. This would result in increased staffing to manage and deliver the compliance process.

Furthermore, although this was not modelled, there is potential for manufacturing jobs to remain constant and change form, rather than decrease. For example, if domestic companies embraced the transition to a circular textiles industry and met eco-design requirements, while regulations reduced the amount of textiles imported, demand for textiles could potentially be met by local manufacturers.

## 4.4 Sensitivity Analysis

Sensitivity analysis was conducted around two key assumptions: PED and the share of costs passed to the consumer. All changes are reported for 2033. Further details can be found in Appendix A.4.0.

### 4.4.1 Price Elasticity of Demand (PED)

As described in Appendix A.3.2.2, a value of -0.7 has been taken for the PED for regular fashion, and a value of -0.85 for super-fast fashion; this affects how the consumption (demand) changes according to the price increases. Since this is a key assumption, a sensitivity analysis has been undertaken to observe the effects of higher/lower PED.

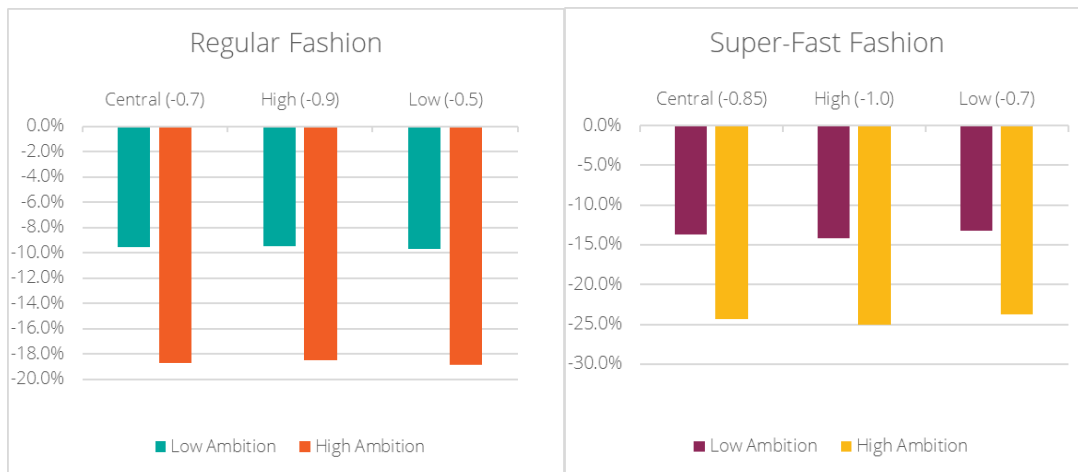
A value of -0.5 would be a very inelastic product, like food or fuel, and it could apply to textiles which are basic necessities. A value of -1.0 refers to unitary elasticity, which would be applicable for more price-sensitive products where increasing the price would decrease the demand at the same rate.

Regular fashion was tested at -0.7, -0.9 and -0.5 PED ("central", "high" and "low", respectively) and super-fast fashion was tested at -0.85, -1.0 and -0.7 PED, looking at the percentage change in the consumption of textiles. The percentage change in consumption for regular fashion remained largely constant (around -9.6% for the low ambition scenario and -18.7% for the high ambition scenario) while the percentage change in consumption for super-fast fashion is shown in Figure 4-18.

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<sup>70</sup> Impacts of circular approaches on emissions, jobs, and other factors. Ministry for Business and Innovation, 2024. Available at: <https://www.mbie.govt.nz/business-and-employment/economic-growth/circular-economy-and-bioeconomy/impacts-of-circular-approaches-on-emissions-jobs-and-other-factors>

**Figure 4-18: Sensitivity Analysis PED - % Change in Consumption**



Changes in consumption are minimal for both regular and super-fast fashion, with the impacts slightly more prominent for super-fast fashion. As expected for super-fast fashion, consumption decreases more under a high elasticity scenario and less under a low elasticity scenario. Under a high elasticity scenario, the price of products has a larger impact on consumption. Therefore, as the price of textiles increases due to the RPS, consumption is reduced more compared to the central scenario. The reverse is true for the low elasticity scenario (the price of the product is less elastic, meaning the price does not influence consumption as much, so when prices increase because of RPS, consumption is less affected compared to the central scenario). Super-fast fashion is assumed to be more price elastic (due to the low price of the textile items).

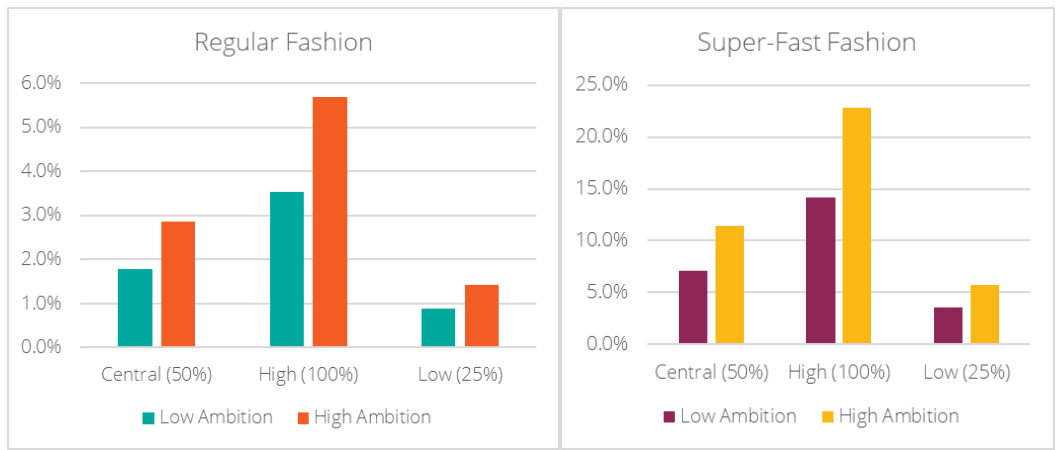
As described in previous sections, the changes in consumption drive the rest of the impacts: waste generation, environmental and social impacts. Consequently, for such limited change in consumption, the resulting impacts on waste generation, environment, and employment should be minimal.

### 4.4.2 Share of Costs Passed to the Consumers

Another key assumption, as described in Section 4.2, is the percentage of costs assumed to be passed on to the consumers. If a higher share of the cost increases (driven by EPR fees and costs of supporting measures) were to be passed on to the consumers by producers, then the consumption of textiles would be further reduced, and vice versa. In the central scenario, it has been assumed that 50% of the costs are passed on to consumers, while in the high scenario, 100% of the costs are passed on, and in the low scenario, 25% are passed on. The corresponding percentage change in price and percentage change in consumption was modelled for both regular and super-fast fashion, and is shown in Figure 4-19 and Figure 4-20.

The price of textiles increases as the percentage cost passed to consumers increases. For super-fast fashion, the increase is much higher than for regular fashion. This is because the price of super-fast fashion items is much lower, and the RPS costs passed on to the consumer are about the same value for both regular and super-fast fashion items. Therefore, the overall impact on the super-fast fashion items is much greater due to RPS costs being a higher proportion of the cost of the item. For example, an increase of \$5 on a \$100 item would be 5% but it would be 50% for a \$15 item.

**Figure 4-19: Sensitivity Analysis for the Share of Costs Passed to the Consumers - % Change in Price for Regular and Super-Fast Fashion**



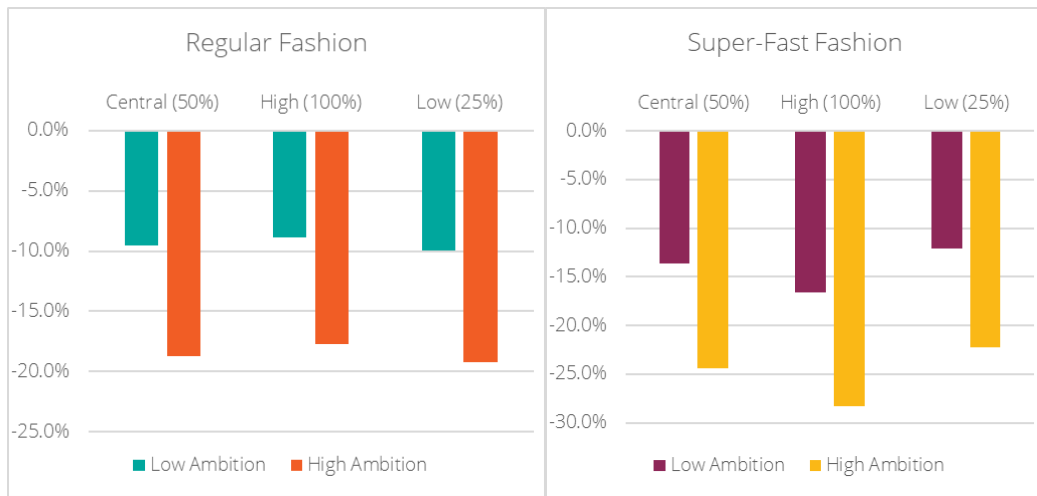
The assumed reduction in consumption under the low and high ambition RPS scenarios is 5% and 15% respectively (as modelled). These reductions are quite ambitious and higher than what could be achieved simply by textile product price increases. Therefore, changing the cost passed to consumers does not change the overall consumption under each scenario, because the overall consumption is dictated from the reduction targets and not from the price of textiles. What changes, however, is the relative consumption between regular and super-fast fashion compared to the central scenario, driven by the price differential between the two product categories.

More specifically, under the high cost pass-through scenario, the price of super-fast fashion increases by a higher rate compared to the price of regular fashion (as explained above) compared to the central scenario. As a result, consumers are likely to switch to regular fashion, the price of which does not go up as significantly compared to the central scenario, and reduce their consumption of super-fast fashion, the price of which goes up substantially compared to the central scenario.

Therefore, although the reduction in overall textile consumption remains the same (due to the overall textile reduction targets), the consumption of regular textiles increases relative to super-fast fashion. This is positive for local producers and for the reduction in the consumption of super-fast fashion generally.

The opposite is true for the low cost pass-through scenario. As there is a lower impact on the price of super-fast fashion compared to the central scenario, consumption of super-fast fashion is higher compared to the central scenario. The difference in consumption rate between regular fashion and super-fast fashion is driven by the differential in their PEDs.

**Figure 4-20: Sensitivity Analysis for the Share of Costs Passed to the Consumers - % Change in Consumption**



The data tables for both sensitivity tests are found in appendix A.4.0.

## 4.5 Wider Impacts

Wider impacts that could not be quantified as part of this study can be grouped into economic (see section 4.5.1), environmental (see section 4.5.2) and social (see section 4.5.3) impacts.

### 4.5.1 Wider Economic Impacts

**International competitiveness:** Policy harmonisation with both the UK and EU streamlines administrative requirements and eliminates the need to navigate multiple separate regulatory frameworks. This reduction in duplication strengthens the global standing of the textiles sector, making exporters more agile and price-competitive in key markets.

**Aotearoa New Zealand Brand.** If an RPS is structured appropriately to be inclusive of a te ao Māori perspective and recognises products made using indigenous techniques, this could enhance perceptions of 'made in Aotearoa New Zealand' and add value to these products, enabling them to be exported at a premium.

**Improved Resilience.** A stronger local circular textiles economy would make the sector less dependent on the global economy, meaning that communities and businesses and the textiles economy would be less exposed to global factors like shipping delays, price swings or trade disruptions like those experienced during the global pandemic. At the same time, support for local jobs and sustainable production makes it easier to respond to demand and environmental conditions, improving domestic resilience.

**Additional Costs to Businesses:** While harmonisation drives competitiveness, it also introduces new compliance obligations. These can impact businesses in the following ways:

- 1. Familiarisation costs:** All textile producers will incur a one-off time investment to understand the RPS requirements in detail. These familiarisation costs - covering staff training and procedural updates - are expected to arise predominantly in the first year.
- 2. Impact on micro and small businesses:** Beyond the initial learning curve, ongoing eco-design mandates - such as requirements for durability, and clear labelling - translate into higher material, manufacturing, and printing expenses. Smaller firms, lacking the economies of scale of larger

competitors, may struggle to absorb these costs, risking narrower margins or higher end-user prices. However, micro and small businesses can also leverage their inherent agility: closer supplier relationships and leaner operations may ease the transition to transparent supply chains and new reporting protocols. By quickly adapting processes and technology, they may ultimately turn compliance into a competitive edge.

## 4.5.2 Wider Environmental Impacts

**Reduced use of virgin materials:** A key impact driver for the textiles sector is the high levels of raw material consumption in the production of new textile products. This is due to increasing levels of consumption, combined with a lack of recycled materials suitable for use in new textile products. RPS can support further exploration in to textile-to-textile recycling (which is not currently available at scale to manage the volumes of textiles being discarded), and if recycled material costs (and quality) are similar to virgin material, this will reduce virgin material use and the industry's reliance on open-loop recycled materials (e.g. recycled polyester fibre from polyethylene bottles). This will, in turn, reduce the impacts associated with raw material extraction.

**Reduce water pollution:** Fibre and textile production requires high levels of chemical consumption; for example, the use of textile dyes and coatings during textile processing. If not properly captured and treated, these chemicals will enter water systems and cause pollution, reducing water quality. However, the modelled decrease in water consumption under the low and high ambition scenarios (due to reduced consumption of textiles) would be expected to lead to a proportional reduction in water pollutants from textiles.

## 4.5.3 Wider Social & Cultural Impacts

**Protected characteristics:** In Aotearoa New Zealand, there are 13 protected characteristics listed in the Human Rights Act.<sup>71</sup> Out of the 13 protected characteristics, two could be adversely impacted by the RPS scheme: family status and age. Due to the purchase of maternity clothes whilst pregnant, those who are pregnant may face higher costs due to the need to buy additional clothing. Similarly, the characteristic of age can be impacted due to the need for parents or guardians to purchase clothing more frequently for their growing children. Some of this cost may be offset by the increased durability of clothing, meaning products are less likely to be disposed of solely due to damage, but this does not address the issue of increased turnover due to a child's growth. RPS will support the reuse of these products to an extent, supporting increased capacity to sort products for resale. Alternative forms of consumption, such as rental and swap shops, can further mitigate potential cost increases.

**Socio-economic impacts.** One of the impacts of the RPS scheme is to raise the cost of new textiles provided into the market, as the cost of the end-of-life management is built into the purchase price. This is calculated to drive a reduction in overall textiles consumption, and (in the high ambition scenario) through eco-modulation fees favouring durability to reduce the consumption of lower quality 'fast fashion' items. This could have a disproportionate impact on lower-income households, who have less purchasing power and are more likely to purchase cheaper goods. One of the intentions of the RPS, however, is to increase the durability of goods; which, if achieved, could offset these impacts by reducing the number of items that need to be purchased and increasing the availability and quality of cheaper second-hand goods.

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<sup>71</sup> Human Rights Act 1993. Available at: <https://www.legislation.govt.nz/act/public/1993/0082/latest/DLM304212.html>

**Impacts on Tangata Whenua.**<sup>72</sup> The connections that iwi Māori have to the natural world through whakapapa and mātauranga Māori place them in a unique position of understanding and kaitiaki. There are opportunities to deliver distributive economic resilience for Māori in balance with the environment. For example, The Te Ōhanga Māori report<sup>73</sup> saw significant growth in the Māori economy so that by 2023, 8.9 per cent of the national GDP was led by tangata whenua (up from 6.5% in 2018).

Potential impacts on tangata whenua, both positive and negative, could result from the introduction of an RPS in Aotearoa New Zealand. These are discussed in detail in Appendix A.1.0. Some of the key impacts could include the following:

- As with society in general, there may be small cost increases for new textiles, which will require a sustained and intensive programme of education and engagement to understand the purpose and outcome of changes to product pricing. Some of these impacts would be mitigated by the introduction of more durable textiles and the availability of higher quality second hand products.
- There is potential for exploration of plant-based fibre economies, such as research and development around harakeke, as pathways for economic and cultural development and environmental restoration.
- There is potential opportunity to hypothecate RPS fees towards fostering innovation and improving the connection between fibre production and nature-based solutions. Funding models can enable equitable access for hapū/iwi and Māori enterprises to develop infrastructure, innovate, and train aligned with environmental and cultural goals.
- Administrative and cost burdens might disproportionately affect Māori enterprises, which tend to be smaller to medium in size; however, with careful fee structuring, programme support and scheme design, this could be managed and mitigated.

**Consumer benefits:** There are a number of consumer benefits to be realised through the implementation of the RPS scheme.

1. Through both the low and high ambition scenarios, consumers will receive regular targeted communications to support education in sustainable consumption and supporting industry circularity (such as the benefits of reduced consumption, or how to reduce their environmental footprint).
2. RPS will also ensure a fairer distribution of costs, by reducing the cost to citizens of municipal collection and disposal, and reallocating it (through producers) to consumers (the costs paid directly in relation to their levels of consumption).

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<sup>72</sup> This section of the report was drafted in collaboration with the Textiles Advisory Group (TAG)

<sup>73</sup> [te-ohanga-maori-2023-report.pdf](#)

## 5.0 Conclusions

In Aotearoa New Zealand, the production and consumption of textiles result in large and increasing amounts of used textiles and textile waste, and very low levels of circularity are currently achieved. The analysis confirms that introducing an RPS scheme for textiles in Aotearoa New Zealand would deliver substantial economic, environmental, and social benefits compared to the current linear system. In a business-as-usual scenario, the costs associated with current textile consumption trends in Aotearoa New Zealand will continue to be externalised onto both people and land.

The modelling predicts a number of benefits for both scenarios, shown in Table 5-1 below, compared to the baseline business-as-usual approach:

**Table 5-1: Benefits of RPS Scenarios (Modelled to 2038)**

	Low ambition scenario	High ambition scenario
Textiles consumption (t) reductions (particularly in super-fast fashion) through consumer education, reuse and repair activities, and (in the high ambition scenario) product labelling and digital product passports	Reduces by <b>14%</b> (down to 134,119 tonnes)	Reduces by <b>23%</b> (down to 119,982 tonnes)
Textiles reused or recycled (%)	49% (an increase of <b>43%</b> )	86% (an increase of <b>80%</b> )
Waste management and resource recovery cost savings to territorial authorities	\$11,947,443	\$66,057,246
GHG emissions (t) through reduction in imports, some reduction in domestic production, and reduction in landfilling textile waste <sup>74</sup>	Reduces by <b>16%</b> (4,271,354 tonnes of CO <sub>2</sub> e) – NPV of \$900 million	Reduces by <b>27%</b> (3,734,768 tonnes of CO <sub>2</sub> e) – NPV of \$1,634 million
Water consumption (m <sup>3</sup> ) due to reduced consumption of textiles – experienced domestically and internationally	Reduces by <b>14%</b> (1,529,417,248 m <sup>3</sup> )	Reduces by <b>23%</b> (1,386,323,377 m <sup>3</sup> )
Increased domestic employment <sup>75</sup> in recycling, remanufacturing and preparation for reuse (to an extent, balanced against a reduction in production-related employment)	A <b>1%</b> increase in employment (2,889 jobs)	A <b>6%</b> increase in employment (3,012 jobs)
Increased revenue from the sale of recycled textile products	An increase of \$1,030,542,191	An increase of \$1,561,449,878

While both the low and high ambition scenarios improve outcomes, the high ambition scenario provides the greatest overall benefit. It achieves greater reductions in textile consumption and waste, significantly higher reuse and recycling rates, and the most pronounced environmental gains, including a 27% cut in

<sup>74</sup> NPV calculated using

<sup>75</sup> Includes textile manufacturing and waste collection and management. Excludes fibre production and retail.

greenhouse gas emissions and a 23% reduction in water use by 2038. It also creates more income from recycled textile sales, jobs in circular economy sectors and offers stronger alignment with international best practice, positioning Aotearoa New Zealand to meet emerging trade and sustainability obligations.

The reduction in demand for low quality and fast-moving textiles demonstrated by the modelling translate into lower waste generation, given the strong correlation between consumption and end-of-life outcomes. At the same time, improved collection, reuse, and recycling systems under both RPS scenarios would substantially reduce the volume of used textiles sent to landfill or exported offshore, strengthening domestic circular infrastructure and keeping materials in use for longer within Aotearoa New Zealand. Circular activities could include a second-hand market, repair and reuse markets as well as higher quality domestic production of textiles.

These benefits do come at a higher cost to producers, with RPS fees estimated at \$2,713 per tonne under the high ambition scenario versus \$1,556 per tonne for the low ambition scenario. Consumer prices would rise modestly for regular textiles and more sharply for super-fast fashion, reinforcing the polluter pays principle and discouraging low-quality, short-lived products. Despite these costs; the societal benefits (including avoided carbon costs of up to \$1.6 billion, reduced landfill reliance<sup>76</sup>, and savings for TAs) make a compelling case for action.

The modelling shows that an RPS scheme would deliver further economic value through emerging markets for recycled textiles and reduced waste management and resource recovery costs. Income from recycled materials has been quantified as an increase of \$1,031mil in the low ambition scenario and \$1,561mil in high ambition scenario. Recycling targets under both scenarios are expected to stimulate demand for sorted textiles that are currently uneconomic to process.

Shifting the cost of managing used textiles and textile waste onto the producer or user will also reduce pressure on the cost of the waste system.

The modelling also highlights additional environmental and employment benefits associated with the transition to a more circular textiles system. Greenhouse gas emissions reductions are achieved primarily through lower levels of imported textile production, alongside reduced landfilling and increased reuse and recycling, delivering avoided carbon costs of up to \$1.6 billion in net present value under the high ambition scenario. From an employment perspective, both RPS scenarios support job growth in recycling, remanufacturing, reuse, and related services.

To maximise the effectiveness of an RPS scheme, supporting policies are essential. International experience, particularly in the European Union, demonstrates that RPS alone cannot deliver full circularity. Complementary measures such as the eco-design mandates included in the Eco-design for Sustainable Products Regulation, recycled content targets, repair incentives, and robust labelling requirements will be critical to drive systemic change. These policies should be integrated with the RPS framework to ensure durability, reparability, and transparency across the textile lifecycle.

Through stakeholder engagement, players in the Aotearoa New Zealand market generally agreed that for RPS to work it must be carefully designed to avoid unintended consequences. There was a desire reflected for funds to be reinvested into infrastructure, R&D, and practical recycling solutions rather than being absorbed by compliance or administration. Stakeholders also highlighted the importance of avoiding risks in the early stages, as poor design could create perverse outcomes such as stockpiling, cost burdens falling disproportionately on smaller players, or greenwashing by larger companies. Comparatively, a well-designed scheme would ensure fair cost-sharing, build local processing capacity, foster collaboration between brands, recyclers, and charities, and include consumer education.

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<sup>76</sup> As covered in section 4 broadly, and 4.3.4 reduced landfill reliance is a desirable environmental outcome.

Wider implications of a textiles RPS in Aotearoa New Zealand include socio-economic aspects and impacts for tangata whenua. Embedding te ao Māori principles within scheme governance and design offers additional cultural and social benefits, ensuring that stewardship embodies kaitiakitanga and supports opportunities for indigenous fibre innovation, equitable employment, and community wellbeing. The inclusion of te ao Māori and mātauranga Māori in design and governance will provide a unique aspect to a textiles RPS scheme for Aotearoa New Zealand. The findings from the modelling reinforce the role of an RPS scheme not only as a waste management tool, but as a demand-side intervention capable of delivering lasting reductions in environmental impacts across the textile lifecycle. This aligns with the Māori worldview which emphasises personal responsibility across the lifecycle of anything that is consumed; and therefore supports an RPS scheme that is designed to make shifts across the whole life cycle rather than just looking to manage waste.

In conclusion, a well-designed RPS scheme, supported by complementary policies and robust governance, represents a transformative opportunity for Aotearoa New Zealand to shift towards a circular textiles economy. This shift would provide economic benefits, reduce environmental harm, and strengthen its international competitiveness while recognising and enabling tino rangatiratanga for Māori by reflecting te ao Māori and including mana whenua in governance. Further engagement and collaboration with stakeholders across the life cycle of the textiles industry in Aotearoa New Zealand will be a critical element of designing a successful policy framework for an RPS scheme and other supporting policies and targets.

# Appendices

# A.1.0 Detail of Stakeholder Engagement Undertaken

The stakeholder engagement consisted of three workshops, a survey, and a series of one-one interviews.

## A.1.1 Workshops

Two workshops were focused on the design of the RPS scheme to be modelled and the third focused on a te ao Māori view on textiles RPS in Aotearoa New Zealand.

### Te Ao Māori Workshop

**Attendees:**

Duncan Wilson – Director (Eunomia)

Katy Chamley – Consultant (Eunomia) engagement

Tanzir Chowdhury – Technical Lead in Economics (Eunomia)

Sarah Pritchett – TAG, Te Whatu Ora, previously WasteMINZ

Alex Kirkham – TAG, Climate Project Innovation Lead – Energy (Climate connect Aotearoa)

Meredith Dawson Lawry, Director - Sustainability Innovation, Corporate Responsibility (Deloitte), chair of a TAG panel

Bernadette Casey – TAG, Co-Founder and Chief Executive (UsedFULLY)

Bry Kopu – Co-Founder and Chief Vision Officer (Rautapatu)

Glen Skipper – Co-Founder and Chief Vision Officer (Rautapatu)

Steve Bagshaw – Chief Scientist (UsedFULLY)

Matthew Scobie – Associate Professor (University of Canterbury)

Cornell Tukiri – Climate Innovation Lead – Māori (Climate Connect Aotearoa)

## A.1.2 Survey

The survey was sent out to TAG members for participation only, the survey questions and results guided the design of the low and high ambition scenarios.

## A.2.0 Detailed RPS Scenarios Modelled

This section outlines in more detail the scenarios modelled as part of this project. These scenarios have been developed using feedback and input gathered from two workshops which have involved the Steering Group and Expert Advisory Committee (EAC).

### A.2.1 Product Scope

The Steering Group and EAC reviewed which products should be included in an Aotearoa New Zealand RPS scheme, categorising them into within scope and out-of-scope, as summarised in the Table A-5-2 below.

**Table A-5-2: Product Scope**

In scope	Out of scope
<ul style="list-style-type: none"> <li>• <b>Clothing textiles:</b> Household and corporate clothing including items such as coats, jackets, suits, trousers, shirts and articles of apparel and clothing accessories, gloves, scarves, socks, hats and other headgear, cloth nappies and underwear, pantyhose and wired and non-wired bras including PVC or leather items.</li> <li>• <b>Household textiles:</b> Items such as household linen i.e., bedding, bathroom textiles and curtains and blankets and travelling-rugs and clothes.</li> <li>• <b>Corporate textiles:</b> Items such as 2D bedding, bathroom textiles, purchased fabrics for use in commercial settings e.g., hotels, restaurants etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Duvets</li> <li>• Mattresses</li> <li>• Mattress protectors</li> <li>• Pillows and cushions</li> <li>• Carpet</li> <li>• Footwear</li> </ul>

The guiding principles for defining the product scope in the Aotearoa New Zealand Textiles RPS scheme, as outlined in the workshop slides, are based on a structured and pragmatic approach.

The scope was developed by reviewing:

- TAG's original proposed scope and definitions.
- Existing Aotearoa New Zealand schemes and what they currently collect.
- EU legislation, particularly the Waste Framework Directive (July 2023).
- Schemes in Australia and France, to understand international best practices.
- Key markets outside Aotearoa New Zealand, to assess what is practical to process and recycle.

This means including items that:

- Have existing collection and processing infrastructure.
- Are feasible to recycle or reuse.
- Align with international schemes and local capabilities.

The products in scope include:

- Brand new products being placed on the market; and
- Used/vintage products imported from outside Aotearoa New Zealand and placed on the market.

This is to ensure the distinction between new product consumption and reused product consumption for which used textiles and textile waste management and resource recovery fees have already been paid (if the new product was placed on the market in Aotearoa New Zealand). It is for this reason that used/vintage products imported from outside of Aotearoa New Zealand should pay a fee, as they are “new” to the Aotearoa New Zealand market and, therefore, the management costs have yet to be paid for by the producer. There is the potential for this to impact reuse systems that rely on used and vintage products from international sources. As such, ideally, there is a harmonised approach with other EPR and RPS schemes, notably those in the EU/Europe and Australia, where fees paid when products are placed on the market can transfer to the country in which products are reused to ensure there is no double counting of costs. The opposite scenario of used textiles from Aotearoa New Zealand being imported by other nations is just as crucial to consider.

## A.2.2 Obligated Parties

The Steering Group and EAC agreed that the obligation should be placed on the brand owner. In the case where there is not an entity in the country that can pick up the brand owner responsibility, then it would fall to the first to place it on the market in Aotearoa New Zealand (for example, the importer, manufacturer, retailer or wholesaler/ distributor).

For the purpose of this study, brand owners who are obligated was defined as *“the organisation that designs, specifies or selects products, and thereby is in the best place to influence those placed on the market”*.

This, as a minimum, would include:

- Brands selling products through their own bricks and mortar stores;
- Multi-brand retailers selling products through bricks and mortar stores;
- Brands selling products through their own ‘brand.com’ websites or platforms;
- Multi-brand retailers selling products through ‘retailer.com’ websites or platforms; and
- Imported second-hand clothing is in scope, as they are entering the market for the first time.

Online marketplace platforms should also be obligated under the scheme (e.g. taking on responsibility for sellers on their website that are not registered with the Aotearoa New Zealand scheme). Where there is no legal entity in Aotearoa New Zealand (e.g. overseas sellers selling direct or via an online marketplace platform), it could be a requirement for there to be an ‘authorised representative’ in the country, without which a business would not be allowed to trade. It was clarified during the second workshop that online/international sellers (e.g., Amazon, Temu, Shein) should have an authorised representative in Aotearoa New Zealand.

The Steering Group also agreed that exemptions (e.g. simplified admin / lower costs) should apply to small businesses that sell new items, and charities that sell used textiles. Additionally, it was emphasised that the scheme should aim to minimise the regulatory and financial burden on Aotearoa New Zealand textile manufacturers if they can demonstrate that they are compliant with the environmental and social obligations of the scheme.

On design and preparation for the implementation of RPS, this definition will need to be refined and agreed upon. Some examples for further consideration include:

- Whether there should be de-minus thresholds for small businesses.
- Whether costs should be allowed to be cascaded down to the consumer (normally something left to the business in question).

However, for the purposes of this project and the modelling this does not need to be defined at this point.

All obligated producers will be legally required to contribute to the scheme. However, the scheme could allow producers to take some individual responsibility for the management of their branded used textiles. These systems would be funded by the producer, and the producer will also receive the proceeds from the sale of products for reuse or recycling, and in doing so keep products out of residual waste. Where producers do so, they would receive a reduction in their fees. However, all products will ultimately return to the used textiles and textile waste management system, and producers are unlikely to collect used and waste textiles in equal quantities to new products they place on the market. As such, the producer will still be responsible for a proportion of scheme costs.

## A.2.3 Cost Coverage

In terms of cost coverage for the RPS, the Steering Group and EAC agreed with following split for the low ambition and high ambition scenarios (see Table A-5-3).

**Table A-5-3: Cost Coverage**

	Low ambition	High ambition
<b>Infrastructure (general)</b>		
Increasing capacity – collection, sorting, treatment	100% of respective CAPEX/ OPEX costs covered.	100% of respective CAPEX/ OPEX costs covered. Higher levels of investment to deliver higher levels of recovery.
Operational costs – day-to-day labour, energy, transport, etc.	Yes.	Yes.
<b>Collection and sorting</b>		
Collection	Drop off sites, plus return to retailer and donations to charities.	As per low ambition, plus kerbside collections <sup>77</sup> .

<sup>77</sup> Occasional collection events in rural areas were not modelled separately because cost data were not available at this level of granularity.

	Low ambition	High ambition
Used textile sorting	Yes, domestic and international, with improved sorting infrastructure in Aotearoa New Zealand.	Yes, domestic and international, with improved sorting infrastructure in Aotearoa New Zealand. Although not explicitly modelled due to the uncertainty around collected textile quality, appetite from private investors, and demand for sorted textiles, the increased separate collection of textiles could instigate investment in automated systems (camera/AI) to help handle larger volumes more efficiently.
<b>Treatment</b>		
Support for Repair, Reuse/Preparing for Reuse (e.g. post ownership repair and remanufacture), and other CEBMs (rental, lease)	Yes, through cost coverage of takeback schemes.	Yes, though cost coverage of takeback and repair schemes.
Recycling	Yes, domestic and international, to meet lower ambition target.	Yes, domestic and international, to meet high ambition target. Although not explicitly modelled due to the broader scope of the analysis, this could be realised through a particular focus on improving domestic wool reprocessing, given the importance of the wool industry in Aotearoa New Zealand.
Disposal	Yes.	Yes <sup>78</sup> .
<b>Other aspects</b>		
Consumer Communications	Simple national communication campaigns and simple product labelling.	Advanced national communication campaigns and eco-modulation labelling plus DPP's.
Management and Administrative costs (including reporting, and compliance)	Yes.	Yes.

<sup>78</sup> The low ambition scenario was designed to cover both domestic and international disposal, with the high ambition scenario covering only domestic disposal. However, no reliable data were available regarding the disposal destination of waste textiles, and it is understood that the quantities of exported textiles for disposal are minimal and unlikely to impact on the modelling outputs. Therefore, the model did not explicitly distinguish between domestic and international disposal, and instead assumed both were covered by both RPS scenarios.

	Low ambition	High ambition
Research & Innovation (in relation to design, collection, sorting, treatment)	No.	Yes.
Market Development for used and low-carbon materials (national and international)	No.	Yes <sup>79</sup> .

The used textiles and textile waste management system is composed of a wide variety of commercial, not-for-profit and municipal actors:

- Commercial entities (private collectors, sorters, recyclers etc.) exist on a for-profit basis, funding existing operations through the sale of outputs. As such, funding should be focused on enhancing capacity and optimal function (for example, optimised collection systems, higher throughput sorting systems for recycling, etc.), improving how materials are handled and the capacity of these organisations to meet specified targets.
- Not-for-profit organisations such as charities provide an important part of textile reuse through collection, sorting for reuse, and resale. The Steering Group and EAC highlighted that care must be taken that the development of the RPS scheme does not negatively impact their function, ensuring funding supports their continued operation and optimisation.
- Councils are typically involved in collection services (kerbside, household waste and recycling centres etc.), with the funding of these services ultimately borne by taxpayers. RPS schemes, and by extension producers, are not obliged to simply pay all of the costs that municipalities incur on such collections, but they should cover the 'necessary costs' – i.e. the costs that are necessary to provide a cost-effective service. Municipalities would need to appropriately evidence these costs to secure funding.

### Minimum standards

In theory, all those actors in the used and waste textile management system that are delivering services within the scope of RPS cost coverage (collectors, sorters etc.) should be paid for delivering a safe and cost-effective service, from the perspective of necessary costs. However, kerbside collection services can delay product return for reuse and do not preserve product quality for reuse (due to, for example, water damage). It should also be noted that cost coverage of kerbside collection services may attract citizens to deposit clothing through these collection routes in preference to donation because it is more convenient for consumers to do so.

This reinforces the necessity for industry-agreed standards or processes to safeguard materials to be developed. For example, minimum requirements for kerbside collections (e.g. how collections must be delivered to maintain the quality of products); and/or partnership agreements with charities/reuse organisations to support the reuse of collected products. Eligibility for funding should be contingent on compliance with these standards for safe, optimised collection and treatment systems. This will ensure that products are only collected and managed through systems that maintain item quality to maximise reuse. Where items are unsuitable for reuse, sorting for recycling standards should also be utilized, to ensure items at high risk of contaminating recycling processes are removed from the system. Standards

<sup>79</sup> No reliable data were identified to allow the explicit modelling of the development of the market for used and low-carbon materials in terms of wider economic benefits, however, the model estimated the growth in gross value added as a result of market growth in reuse and recycling systems.

will need to be developed and agreed upon by the Producer Responsibility Organisation (PRO), in conjunction with the government and actors within the used textile and textile waste industry, to ensure they are appropriate. This will need to be accompanied by the appropriate due diligence systems.

**When designing the scheme, the following should also be considered:**

- **Minimum standards for export both for products going for reuse and recycling.** This is to ensure products are of the appropriate quality and so avoid unregulated waste exports. This will require a stringent verification and enforcement system, likely in conjunction with customs, to systematically tackle waste colonialism. This will only increase in importance as greater quantities of material are initially collected, as it provides the potential for textile waste to be inappropriately exported under the label of 'used textiles' for reuse, necessitating other countries to manage it. This should be supported through cost coverage of international sorting and recycling.
- **Level of funding.** The level of funding provided to organisations will likely change over time, depending on the value gleaned from the materials collected and treated to ensure: 1) The continued operation and development of the actors facilitating reuse; and 2) The development of alternative end markets for the material unsuitable for reuse. The distribution of funding between the different elements of used textile and textile waste management, and the different actors within these elements, will be the responsibility of the PRO to evaluate and agree on.

However, for the purposes of this project and the modelling this does not need to be defined at this point.

**Further information on the costs to be covered**

- **Reduction measures:** Support for rental, lease and other circular business models (CEBMs), as well as repair, is an important route that offers the potential to reduce the consumption of textiles, and in particular, fashion items, school clothing etc. Note that product design issues, such as durability and use of natural materials or recycled content, which may go hand-in-hand with CEBMs, are best covered through eco-modulation of fees, not how fees are distributed to fund things, which is more about the operational aspects and infrastructure (as covered here).
- **Collection:** Cost coverage should include funding of separate collections, which may differentiate between directly reusable (e.g. wearable) and unusable (waste). This is to support collection operators (covering municipal, not for profit and commercial operators) to ensure systems are optimised to meet agreed standards, increase collection capacity, and ensure improved access to collection for citizens by addressing geographical collection disparities. This excludes costs for producers implementing individual producer responsibility systems. For the purposes of this project kerbside collections are excluded from the low ambition scenario but included in the high ambition scenario.
- **Sorting:** Cost coverage should include funding to support domestic sorting operators, both commercial and not-for-profit. Activities include both sorting of used textiles (reuse sorting) and waste textiles (preparation for reuse and recycling). This will be a necessity to ensure that the greater volumes of material collected can be appropriately sorted to identify all items suitable for reuse (so that wherever possible they are directed to reuse systems) and make sorting for recycling on a larger scale economically viable, in accordance with the waste hierarchy. RPS fees should accompany items exported for sorting. Where international sorting facilities can demonstrate compliance with sorting standards, this cost coverage should not be inhibited. This is particularly relevant given sorting for reuse in developing countries is significant. However, tracking material flows may be complex for some sorting systems to accurately verify costs and compliance with standards. Where this is the case, international development funding should be

utilised. In addition, although not explicitly modelled due to the uncertainty around collected textile quality, appetite from private investors, and demand for sorted textiles, the Steering Group recognised that RPS funding should be used to improve automated AI sorting systems in Aotearoa New Zealand, and highlighted the possible need for DPP and/or labelling to support this.

- **Reuse and Preparing for Reuse.** Supporting reuse and preparing for reuse activities is one key to reducing the generation of textiles waste and improving circularity. For example, under the French AGEC Law, textile producers must allocate 5% of their Extended Producer Responsibility (EPR) fees to reuse initiatives and up to 10% to a repair fund that helps subsidize consumer repairs. As of 2025, this bonus can cover up to 25% to 60% of the repair cost, depending on the type of item and the nature of the repair. Remanufacturing could also be included here.
- **Recycling:** Cost coverage should include funding to support existing recycling, and the development of recycling infrastructure to meet closed-loop recycling targets. This should both be for both domestic and international recycling, provided facilities can demonstrate compliance with standards and provide appropriate and verifiable cost evidence for materials received from Aotearoa New Zealand. Where this is not possible, international developing funding should be utilized. The lack of commercial scale textile-to-textile recycling systems means that significant strategic capital investment is required. While the market may be able to provide sufficient recycling capacity in time to meet targets, the RPS scheme should have a role in ensuring there is sufficient capacity to process textile waste, and sufficient quantities of material to process. This will create a supply of high-quality, recycled materials to meet demand from producers and so replace virgin resources. While continued innovation is positive, there is great uncertainty regarding the economic and environmental viability of some of these technologies on a commercial scale in the long term. For this reason, funding from the RPS scheme should be contingent on technologies working with the RPS scheme to demonstrate that the technology is viable and suitable for commercialisation, and therefore able to contribute to meeting the RPS scheme's goals. Recyclers should also be required to provide evidence with regard to the environmental impact of the recycling process. Although not explicitly modelled due to the broader fibre scope of the analysis, the Steering Group noted that there should be a particular focus on wool reprocessing in Aotearoa New Zealand.
- **Recovery & disposal:** Cost coverage should include domestic recovery and disposal (landfill or incineration if developed), constituting the gate fee for recovery/disposal, based on the proportion of residual waste made up of products in scope of the RPS scheme. This will be informed through composition studies, funded through the PRO. Cost coverage should also include all costs associated with the transport and production of Refuse Derived Fuel (RDF), either domestically or internationally. It is recommended that the total cost will be distributed to whichever actors in the territorial area are currently paying for the cost of textile recovery/disposal. Distribution should be on a per capita basis e.g. municipalities receive payments based on the number of people in the Authority Area. For the avoidance of doubt, this includes both the costs for incineration and landfill.
- **Communications.** Communicating with the public and businesses is a key aspect of driving better behaviours (e.g. avoiding fast fashion) and choices. This includes both national campaigns to encourage reduction, reuse and recycling, and in regard to labelling of items (and product passports) to inform consumers (on the impact of their choices, and care requirements to increase life) and recyclers (e.g. to guide them on materials present, processes required). Ideally there would be full transparency around why a product may be attracting a higher upfront fee, which could be done through a colour-coded label which reflects the eco-modulation score.

- **Research & Innovation.** Research and development support can be used to drive a wide variety of activities, from better design, e.g. using durable natural fibres, via CEBMs (e.g. rental models), to better waste textile management, such as fibre identification to support sorting (a key issue highlighted by stakeholders). Costs coverage could include:
  - Approved R&I projects;
  - Monitoring of and reporting on the projects;
  - Maintaining a library of projects funded; and
  - Sharing of project outputs and other feedback for producers including outcomes of the research.
- **Market Development Funding.** This could be utilized to support improved textiles management in countries importing large quantities of textiles from Aotearoa New Zealand for reuse and/or recycling, i.e. to encourage closed loop recycling into new textiles, as well as market development activities for 'better fibres' in Aotearoa New Zealand and overseas. This will require minimum export standards (and associated regulation and enforcement) to ensure that export markets get useable materials, and to prevent the dumping of poor-quality textiles waste overseas.
- **Management and administrative costs** including:
  - Governance and Admin Costs. It is recommended that the scheme consists of three levels of governance and administration: Oversight, Strategic Management and Day-to-Day Management.
  - Data gathering and Reporting
  - Due Diligence, Compliance and Enforcement (e.g. of producers, exporters, service providers in Aotearoa New Zealand)

## A.2.4 Producer fees

### Fee structure

In an optimal scenario, the fees paid by a producer are reflective of the actual costs of management of the individual items placed on the market. However, the complexity of products, an issue that's particularly relevant for textiles, means that the fee structure must typically utilise proxy values at the outset.

The French EPR scheme estimates an overall tonnage placed on the market based on the type of item. Initially, this would likely be a requirement for an RPS scheme in Aotearoa New Zealand. However, ideally, it would be a requirement that items placed on the market have a unit weight associated with them, to avoid the need for a proxy value. Equally, as the scheme evolves, increasing levels of data will be captured concerning varying management costs (such as the processing costs for different fibre types). In this way, over time the fees charged can become increasingly granular and more reflective of the actual costs of dealing with specific items. This transition has already been seen in some packaging EPR examples, with fees for PET bottles in Belgium evolving from a single fee for all colours, to different fees based on colour, and opacity, with an increasing divergence between the cheapest fees (for clear PET) and those for coloured (varying by colour) and opaque, reflecting the different net costs of recycling them.<sup>80</sup>

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<sup>80</sup> Fostplus (2025) The Green Dot rates, available at <https://www.fostplus.be/en/members/green-dot-rates>

## Eco-modulation

A key principle for RPS is that producers are provided with incentives to design (or specify or select) products that reduce environmental impact. One means to achieve this can be the modulation of fees for new textiles placed on the market. Used textiles would potentially attract no fee.

The Steering Group and EAC agreed to adopt the following criteria as a baseline for the **low ambition scenario**, focusing on durability.

For the **high ambition scenario**, the Steering Group and EAC agreed to explore additional criteria, such as:

- The requirement for an ecolabel
- Reparability

Bonuses or penalties (maluses) would be applied based on performance against these criteria in both scenarios.

## A.2.5 Performance Targets

Table A-5-4 outlines the detailed performance targets included in the model. As the EU Waste Framework Directive currently does not specify quantitative targets for textile waste, the proposed figures are informed by existing EPR schemes in France and the Netherlands.

All targets presented below are assumed to be achieved 5 years after the RPS scheme becomes operational. The modelling assumes that the RPS scheme becomes operational in 2028, with targets therefore achieved in 2032.

**Table A-5-4: Detailed Performance Targets**

Type of Target	Low Ambition	High Ambition	Context
Reduction targets	5% reduction in textile waste generated	15% reduction in textile waste generated	The French National Waste Management Plan states that they are targeting to reduce the quantity of household and similar waste produced per capita by 15% by 2030.
Collection	60% of textiles placed on the market collected separately	97% of textiles placed on the market collected separately	The French EPR scheme has implemented a target to collect 60% of used textiles, household linen and footwear by 2028.  In the Netherlands, the Decree on EPR for textiles states that 90% of textile products placed on the market should be collected by 2025, and 100% should be collected by 2030.

Sorting and reuse/ preparing for reuse	15% of collected textiles prepared for reuse	30% reuse rate for collected textiles, with incentives for domestic reuse channels	<p>The French EPR schemes aims to sort 120,000 tonnes of used textiles, household linen, and footwear for reuse in 2024. Additionally, by 2028, 15% of these items should be reused within 1,500 km of their collection point.</p> <p>In the Netherlands, the Decree on EPR for textiles states that 25% of textile products placed on the market should be reused (15% domestically, and 10% internationally)</p>
Recycling	40% recycling rate for textile waste in scope that is not suitable for reuse	80% recycling rate for textile waste in scope that is not suitable for reuse	The French EPR scheme sets a target to recycle 80% of used textiles, household linen, and footwear that are not suitable for reuse by 2027.

## A.3.0 CBA Methodology

This section sets out to further detail the data sources and assumptions used in the CBA model.

### A.3.1 Baseline Scenario

The import, export and production data for clothing in scope was estimated using consumption and waste flows in Auckland, scaled up to national level using population figures.<sup>81</sup> The import, export and production data for household textiles in scope was estimated using Aotearoa New Zealand trade data, broken down by HS codes for in scope materials. HS codes are used for classifying traded products and determining tariff rates. However, this data was provided in as values (\$) rather than weight in kg, so further calculations and comparisons to other sources were required to estimate total import, export and production weight. The import, export and production data enabled calculation of the domestic consumption of products in scope. It was assumed for modelling purposes that 50% of the clothes imported into Aotearoa New Zealand are super-fast fashion. This was tested in the sensitivity analysis in Section **Error! Reference source not found.**

#### Equation 1: Determination of Aotearoa New Zealand consumption quantities

$$NZ\ production + Imports - Exports = NZ\ consumption$$

## A.3.2 Impact Parameters

### A.3.2.1 Textiles

As described earlier, the main data source for quantities of textiles are the Sapere report (Davies et al., 2023) and Aotearoa New Zealand trade data. Further to the textile quantities, the types of fibres need to be considered, as these will affect the environmental impacts. Table A-5-5 below shows the assumptions of fibre groups for clothing and household textiles.

**Table A-5-5: Fibre Contents per Type of Item<sup>82</sup>**

Fibre group	Main fibre type	Garments	Household textiles
Cotton	Cotton	48.3%	55.2%
	Polyester	26.9%	19.3%
	Acrylic	2.6%	4.6%
Plastic-based	Polyamide/nylon	5.8%	6.3%
	Polyurethane/Polypropylene/ Elastane	2.9%	2.1%
	Wool	0.9%	0.9%

<sup>81</sup> Davies, P., Laing, R., O'Hare, J. and Woock, K., 2023. *Fashion clothing consumption and waste flows in the Auckland region: Towards understanding textile waste and consumption streams*. Sapere Research Group for Auckland City Council. Available at: [link](#)

<sup>82</sup> SCAP 2018 Report, household textiles is an average from the Impro Textiles Report 2014. Available at: <https://publications.jrc.ec.europa.eu/repository/handle/JRC85895>

Silk	0.1%	0.0%
Flax/Linen	1.1%	1.6%
Regenerated Cellulosics	10.5%	10.0%
Other	0.9%	0.0%

This table has been further condensed, for ease of calculations and to fit the model structure.

**Table A-5-6: Fibre Contents per Type of Item (Condensed)**

Main fibre type	Clothing	Household textiles
Cotton	48.3%	55.2%
Plastic-Based	38.2%	32.3%
Others	13.5%	12.5%

## A.3.2.2 Economic Impacts

The average retail price of textiles in has been converted from the average retail price of textiles in the UK in 2020.<sup>83</sup> This figure was calculated by averaging three data sources of the average spend on textiles, and dividing by the amount of textiles placed on the market. The three sources are:

£74,000 million, from UKFT<sup>84</sup>

£61,000 million from BFT<sup>85</sup>

£45,000 million from Statista<sup>86</sup>

This has yielded an average UK retail price of £34,090.55 per tonne of textile, or an average Aotearoa New Zealand retail price of \$84,433.20.

It was assumed, for modelling purposes, that super-fast fashion textiles are 25% the price of 'regular' textiles, costing \$21,108.30 per tonne of textile.

**Price Elasticity of Demand (PED)** is a key parameter which determines how demand for a certain product/service changes due to changes in price. The calculation is shown in Equation 2. For a normal good the value of price elasticity is negative given the inverse relationship between the demand and the price of a good. Absolute values lower than 1 are considered to be inelastic (i.e., relative change in

<sup>83</sup> WRAP, 2022, Textiles Policy CBA, Prepared by Eunomia Research and Consulting Ltd. Available at:

[https://www.wrap.ngo/sites/default/files/2023-03/2023\\_03\\_20\\_Textiles\\_CBA\\_-\\_Final\\_Report.pdf](https://www.wrap.ngo/sites/default/files/2023-03/2023_03_20_Textiles_CBA_-_Final_Report.pdf)

<sup>84</sup> Ukfr (n.d). About the UK fashion and textiles industry. Available at: <https://www.ukft.org/business-advice/industry-reports-and-stats/>

<sup>85</sup> BFTT (2021). Mapping the UK Fashion, Textiles and Technology Ecosystem. Available at [https://bftt.org.uk/wp-content/uploads/2021/08/BFTT\\_Mapping-the-UK-Fashion-Textiles-and-Technology-Ecosystem\\_2021.pdf](https://bftt.org.uk/wp-content/uploads/2021/08/BFTT_Mapping-the-UK-Fashion-Textiles-and-Technology-Ecosystem_2021.pdf)

<sup>86</sup> Statista (2025). Consumer spending on clothing in the United Kingdom (UK) from 2005 to 2023. Available at: <https://www.statista.com/statistics/289999/consumer-spending-on-clothing-in-the-united-kingdom-uk/>

demand is lower than the relative change in price), while absolute values higher than 1 are considered elastic (i.e., relative change in demand is higher than the relative change in price).

Whether the demand is elastic or inelastic, depends on availability of substitute goods. The higher the availability of substitutes, the more price elastic demand will be. Thus, luxury items tend to be price elastic, whereas necessities tend to be price inelastic. Based on a brief literature review, it was found that demand for clothing tends to be price inelastic, as clothing is considered a necessity. However, demand for clothing tends to be less inelastic compared to some other necessities like food, and fuel, for example. A study comparing price and income elasticities of demand for clothing, education, medical care, and recreation in low-, medium- and high-income countries estimated the price elasticity of demand for clothing in high income countries as -0.7, which was used in the model.<sup>87</sup> It was assumed that price elasticity for super-fast fashion textiles would be more elastic than 'regular' textiles, as this type of clothing tends to be consumed due to the low price, rather than out of necessity. The price elasticity for super-fast fashion was therefore set at -0.85.

### Equation 2: Price Elasticity of Demand

$$PED = \frac{\Delta D/D}{\Delta P/P}$$

The **social discount rate** has been taken at 2% as per the Aotearoa New Zealand Treasury<sup>88</sup> and it is used to calculate the Net Present Value (NPV).

The assumptions around **carbon value** will help monetise the GHG savings. The 2024 values have been taken from the Aotearoa New Zealand government values for policy appraisal<sup>89</sup>, and presented in Table A-5-7 below are the central values which have been used in the model.

**Table A-5-7: Carbon Values (\$/tCO<sub>2</sub>e)**

Year	Carbon value	Year	Carbon value
2025	120	2033	194
2026	132	2034	200
2027	143	2035	206
2028	155	2036	212

<sup>87</sup> Sabatelli L (2016) Correction: Relationship between the Uncompensated Price Elasticity and the Income Elasticity of Demand under Conditions of Additive Preferences. PLOS ONE 11 (4): e0154487. <https://doi.org/10.1371/journal.pone.0154487>

<sup>88</sup> The Treasury New Zealand (2024). Discount Rates. Available at: <https://www.treasury.govt.nz/information-and-services/public-sector-leadership/guidance/reporting-financial/discount-rates>

<sup>89</sup> The Treasury New Zealand (2024). Assessing climate change and environmental impacts in the CBAX tool. Available at: <https://www.treasury.govt.nz/sites/default/files/2024-10/cbax-tool-climate-environmental-impacts-oct24.pdf>

2029	166
2030	178
2031	183
2032	189

2036	212
2036	212
2037	219
2038	225

With regards to inflation, the model uses real values which are adjusted for inflation and show prices at a constant level. Real values enable the comparison of prices or quantities and present a more accurate picture of the costs/benefits.

Several cost estimates have been gathered for the different activities across the value chain.

**Collection costs** come from a UK stakeholder questionnaire for the Wrap textile CBA<sup>90</sup>, converted to \$ for this model:

- Territorial Authority collection (\$/t) 509
- Refuse Transfer Station Collection (\$/t) 492
- Charity shop (\$/t) 993
- Textile bank (\$/t) 740
- Refuse Transfer Station recycling (\$/t) 492

**Disposal costs** have been gathered from NZ team and the Aotearoa New Zealand Government rates<sup>91</sup>:

- Landfill gate fee (\$/t) 103
- Landfill levy (\$/t) 60 in 2024, rising to 75 by 2027
- Emissions Trading Scheme (ETS) fee (\$/t) 20<sup>92</sup>

The **preparation for reuse** costs also come from the UK stakeholder questionnaire, except for the operational expenditure (op-ex) datapoint, and have been converted to \$:

- o Warehousing costs (\$/year) 20,923
- o Sorting cost (\$/t) 664
- o Op-ex (\$/t) 1,031
- o Waste disposal costs (\$/t) 343

<sup>90</sup> WRAP, 2022, Textiles Policy CBA, Prepared by Eunomia Research and Consulting Ltd. Available at:

[https://www.wrap.ngo/sites/default/files/2023-03/2023\\_03\\_20\\_Textiles\\_CBA\\_-\\_Final\\_Report.pdf](https://www.wrap.ngo/sites/default/files/2023-03/2023_03_20_Textiles_CBA_-_Final_Report.pdf)

<sup>91</sup> New Zealand Government. 2025. New Zealand's Greenhouse Gas Inventory. Available at:

<https://environment.govt.nz/assets/publications/GhG-Inventory/GHG-Inventory-2025/Volume-1-GHG-Inventory-2025-ME1885.pdf>

<sup>92</sup> This figure was obtained from combining estimates on the cost per tonne of carbon credits in New Zealand (\$55-60), the assumed tCO<sub>2e</sub> emissions per tonne of waste landfilled (1.023), and the average gas capture rate in New Zealand landfills (60-65%).

Most of the **recycling costs** have been gathered from WRAP's Fibre to Fibre Recycling report<sup>93</sup> and converted to \$, except for the op-ex datapoint and capex costs, which has been provided by a French stakeholder, have been annualised assuming a 10% interest rate over 15 years:

**Table A-5-8: Summary of Recycling Costs**

Recycling costs	Value
Facility capacity (Chemical recycling) (t/year)	62,500
Funding cost per facility (Chemical recycling) (\$)	\$40,152,700
Facility capacity (Mechanical sorting) (t/year)	30,000
Funding cost per facility (Mechanical sorting) (\$)	\$21,133,000
Op-ex (\$/t) <sup>94</sup>	\$214
Annualised Capex costs (Chemical recycling) (\$/t)	\$115.92
Annualised Capex costs (Mechanical recycling) (\$/t)	\$92.61

The **RPS fees** are a fixed component of the costs, which has been estimated from a combination of inputs of other EPR/ RPS schemes (UK and international), stakeholder inputs and other sources, converted from GBP to NZD.

Income from recycled materials has been modelled based on various data points provided in confidence by industry; assuming a variety of material inputs, product outputs, and market values.

**Table A-5-9: RPS Costs for Low Ambition and High Ambition Scenarios**

	Low Ambition	High Ambition
Operating Costs	NZ \$2,212,068	NZ \$2,212,068
Compliance costs	NZ \$99,311	NZ \$99,311
Additional Communication Costs		NZ \$346,363
Takeback scheme handling cost	NZ \$1,019,600	NZ \$1,019,600
Monitoring costs	NZ \$691,271	NZ \$691,271
R&D		NZ \$579,793
Repair		NZ \$579,793

<sup>93</sup> WRAP (2019), Fibre to fibre recycling: An economic & financial sustainability assessment, available at: <https://wrap.org.uk/resources/guide/fibre-fibre-recycling-economic-financial-sustainability-assessment>

<sup>94</sup> Source is: ECO TLC report

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**Total PRO Costs (\$/year)****NZ \$4,022,250****NZ \$5,528,198**

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### A.3.2.3 Environmental Impacts

In order to determine the **greenhouse gas (GHG) emissions** and **water usage**, each stage of the lifecycle needs to be analysed separately. With regards to production, differentiation needs to be made according to the type of fibre. Table A-5-10 shows the carbon and water footprint of fibre production, use and disposal. The values for the *plastic-based* and *other* fibre groups are averages of the fibre types within the group.

**Table A-5-10: Carbon and Water Footprint of Production, Use and End-of-Life per Fibre Group**

Lifecycle stage	Sub-type	GHG footprint [tonnes of CO <sub>2</sub> e per tonne]	Water footprint [m3 of water per tonne]
Fibre production	Cotton	6.00	8,800
	Plastic-based	8.75	43.75
	Other	44.00	21,155
Textile production <sup>95</sup>	All types	12.20	3,876
In-use <sup>96</sup>	All types	50.00	50
End-of-life <sup>97, 98</sup>	Landfilling	0.532	0
	Recycling	-0.86	0
	Reuse	-2.34	0

The impacts for the in-use phase have been assumed to correspond to the impacts of washing, and the impacts of transport are considered to be similar to the UK and therefore, negligible.<sup>100</sup>

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<sup>95</sup> Yarn production, dyeing, weaving, knitting

<sup>96</sup> WRAP (2020), *Valuing our Clothes: the cost of UK fashion*, available at [https://wrap.org.uk/sites/default/files/2020-10/WRAP-valuing-our-clothes-the-cost-of-uk-fashion\\_WRAP.pdf](https://wrap.org.uk/sites/default/files/2020-10/WRAP-valuing-our-clothes-the-cost-of-uk-fashion_WRAP.pdf)

<sup>97</sup> End of life CO<sub>2</sub> (equivalent) figures from: Payet, J. Assessment of Carbon Footprint for the Textile Sector in France. *Sustainability* 2021, 13, 2422. <https://doi.org/10.3390/su13052422>

<sup>98</sup> Payet, J. Assessment of Carbon Footprint for the Textile Sector in France. *Sustainability* 2021, 13, 2422. <https://doi.org/10.3390/su13052422>

<sup>99</sup> End of life CO<sub>2</sub> (equivalent) figures from: Payet, J. Assessment of Carbon Footprint for the Textile Sector in France. *Sustainability* 2021, 13, 2422. <https://doi.org/10.3390/su13052422>

<sup>100</sup> WRAP (2017), *Valuing our Clothes: the cost of UK fashion*, Available at: [https://wrap.org.uk/sites/default/files/2020-10/WRAP-valuing-our-clothes-the-cost-of-uk-fashion\\_WRAP.pdf](https://wrap.org.uk/sites/default/files/2020-10/WRAP-valuing-our-clothes-the-cost-of-uk-fashion_WRAP.pdf)

## A.3.2.4 Social Impacts

The data for historical<sup>101</sup> and projected<sup>102</sup> Aotearoa New Zealand population has been extracted from the Stats NZ. This results in a range of annual growths between 0.8% to 1.0%, with an average growth of 0.9% over the period 2025 to 2041.

In order to determine the employment impacts, the CBA model uses **employee intensity factors**, i.e. how many full-time equivalent (FTE) jobs are required to process (produce/ collect/ recycle/ etc.) a tonne of textile. These factors are displayed in Table A-5-11, the production figure has been determined from data reported by Stats NZ<sup>103</sup> and the waste management figures originate from Suez in the UK.<sup>104</sup>

**Table A-5-11: Employee Intensity Factors Used in the CBA Model**

	Employment intensity (FTEs per ton)
Production	0.06290
Collection	0.00136
Prep for Reuse (including sorting)	0.00500
Remanufacturing	0.00500
Recycling	0.00500
Disposal	0.00010

<sup>101</sup> Stats NZ (2024). Population. Available at: <https://www.stats.govt.nz/topics/population/>

<sup>102</sup> Stats NZ (2024). Population estimates and projections. Available at: <https://www.stats.govt.nz/topics/population-estimates-and-projections/>

<sup>103</sup> Stats NZ (2024). Enterprises by industry 2000-2024. Available at: [link](#)

<sup>104</sup> SUEZ, A vision for England's long-term resources and waste strategy. Available at: <https://www.suez.co.uk/-/media/suez-uk/files/publication/suez-resourcesandwastestrategyvision-2018529.pdf>

## A.4.0 Sensitivity Analysis

We have undertaken sensitivity analysis around key assumptions and modelling parameters to identify how the CBA results would change. For ease of readability, all changes will be compared to year 5 after implementation, namely 2033.

### A.4.1 Price Elasticity of Demand (PED)

Table A-5-12 shows how the same price increases result in different changes in consumption reduction for regular fashion, and Table A-5-13 shows the same for super-fast fashion.

**Table A-5-12: Sensitivity Analysis for Price Elasticity of Demand (PED) - Regular Fashion**

	%change in price 2033		%change in consumption 2033		
	PED value	Low Ambition	High Ambition	Low Ambition	High Ambition
<b>Central</b>	-0.70	1.8%	2.9%	-9.6%	-18.7%
<b>High</b>	-0.90	1.8%	2.9%	-9.5%	-18.5%
<b>Low</b>	-0.50	1.8%	2.9%	-9.7%	-18.8%

**Table A-5-13: Sensitivity Analysis for Price Elasticity of Demand (PED) - Super-Fast Fashion**

	%change in price 2033		%change in consumption 2033		
	PED value	Low Ambition	High Ambition	Low Ambition	High Ambition
<b>Central</b>	-0.85	7.1%	11.5%	-13.7%	-24.4%
<b>High</b>	-1.00	7.1%	11.4%	-14.1%	-25.1%
<b>Low</b>	-0.70	7.1%	11.5%	-13.2%	-23.7%

The consumption of regular fashion has very limited response with the range of PED values between -0.5 and -0.9. However, as expected, the consumption of super-fast fashion changes with different PED values, within a range of -13.2% to -25.1% for PED values of -0.7 to 1.0.

### A.4.2 Share of Costs Passed to the Consumers

Table A-5-14 below presents the results of a High and Low scenario, with 100% and 25% of the costs passed on to consumers, respectively, for regular fashion and Table A-5-15 shows the same for super-fast fashion.

Table A

**Table A-5-14: Sensitivity Analysis for the Share of Costs Passed on to the Consumers (Regular Fashion)**

		% change in price 2033		% change in consumption 2033	
	% costs	Low Ambition	High Ambition	Low Ambition	High Ambition
<b>Central</b>	50%	1.8%	2.9%	-9.6%	-18.7%
<b>High</b>	100%	3.5%	5.7%	-8.9%	-17.8%
<b>Low</b>	25%	0.9%	1.4%	-10.0%	-19.2%

**Table A-5-15: Sensitivity Analysis for the Share of Costs Passed on to the Consumers (Super-Fast Fashion)**

		% change in price 2033		% change in consumption 2033	
	% costs	Low Ambition	High Ambition	Low Ambition	High Ambition
<b>Central</b>	50%	7.1%	11.5%	-13.7%	-24.4%
<b>High</b>	100%	14.1%	22.8%	-16.6%	-28.2%
<b>Low</b>	25%	3.6%	5.7%	-12.1%	-22.2%

There is a range of possible changes in consumption from -8.9% to -19.2% for regular fashion and -12.1% to -28.2% for super-fast fashion.

It is worth noting that the increase in price does not necessarily mean that consumers will pay, for example, an extra 2.9% per year for regular fashion under the high ambition scenario. The 2.9% was calculated by taking the EPR fee and cost of supporting measures (in \$/tonne of textile) added to the average price of a tonne of textile. The average price per tonne of was calculated by converting the UK average price per tonne (£34,000)<sup>105</sup> to \$ and divided by the average amount of textiles consumed a year from the baseline data (splitting regular and super-fast fashion). This provides us with an average price for regular fashion of \$84,000 per tonne of textile and it was assumed that super-fast fashion is 25% cheaper, at \$21,000 per tonne.

<sup>105</sup> WRAP (2022). Textiles Policy CBA. Available at: <https://www.wrap.ngo/sites/default/files/2023-03/2023%2003%2020%20Textiles%20CBA%20-%20Final%20Report.pdf>

