

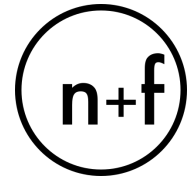
Textiles | A priority material for a circular future in Australia

This paper examines key reasons why textiles should be made a priority material and industrial sector within the Australian Government's Circular Economy commitment.

About the Authors | Now+Future

Now and Future is a collective of experts in Fashion and Textiles across business, industry, creative, education and research. Our aim is to make sustainability knowledge and information more accessible for fashion and textiles consumers, industry and government.

Now and Future recognises the strong and proud Aboriginal history of what we now call Australia. A history dating back tens of thousands of years and appreciated as the oldest living culture in the world. We acknowledge the Traditional Custodians of country throughout Australia and their connections to land, sea and community. We pay our respect to their elders past and present, and extend that respect to all Aboriginal and Torres Strait Islander peoples today.



Executive Summary

This paper examines two key reasons why textiles should be made a priority material and sector within the Australian Government's Circular Economy commitment. The first is the high cost currently associated with processing textile waste streams, the majority of which go straight to landfill. The second is the opportunity that exists to capture significant value, innovation development and create employment from textile materials through the circular economy.

We then describe the changes that are happening in the textiles industry, globally and in Australia, to move towards a circular economy, showing that our problems, in Australia, are not always unique and that strategies in other areas are already demonstrating the immense value that can be created from strategic change. We conclude with our recommendations for the pathway ahead.

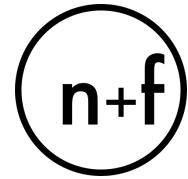
The high cost of Australia's textile waste

Directly (or as contaminant¹) textiles and the fashion industry are a significant contributor to material waste levels in Australia. Although more data is needed to accurately measure and analyse the textile waste stream (including the material make-up of the waste mix) what is clear is that textile waste from households (annually ~247,000 tonnes²) is disposed of and predominantly ends up in landfill, incineration or exported for recycling. Additionally, the material recovery rate for textiles, leather and rubber is one of the lowest in Australia (alongside plastics) at only 26%³ where as as US study found that 'up to 56% of textile waste is suitable for fibre-to-fibre recycling, representing a potential value increase USD \$1.5billion

¹ CSIRO 2020 National circular economy roadmap for plastics, glass, paper and tyres

²<https://www.abs.gov.au/statistics/environment/environmental-management/waste-account-australia-experimental-estimates/latest-release>

³<https://www.abs.gov.au/statistics/environment/environmental-management/waste-account-australia-experimental-estimates/latest-release>



annually⁴. The problem is also getting bigger, with the overall material footprint of Australia rising by more than 30% between just 1990 to 2007⁵.

Australia's more than \$27 billion⁶ dollar textile and fashion industry, made up of more than 90% imported products⁷, generates an estimated 600 million kg of household and non-household textile waste annually. Close to 100 million kg⁸ of this waste is being re-exported to developing nations, often becoming landfill, which leaves around 500 million kg⁹ of leather and textiles ending up in local landfill.

Opportunity to create value: Textiles and a circular economy

Textiles are well suited to circular economy systems. The materials that textiles are made from have high intrinsic value and are suitable for recycling into new products. Textiles are long lasting, durable materials that are designed for long-term use, and are therefore also well suited to the cascading stages of the circular economy; and especially product life extension such as repair, reuse and re-manufacture. Textiles represent both biological (eg cotton and wool) and technical (eg polyester) material groups, connecting them to both agriculture and to materials innovation industries (eg petrochemical, plastics and construction) through material extraction, regeneration and recycling. In practice these two material groups are very often blended (eg polycotton fabric) which poses significant technical and systemic challenges to the development of the sustainable mass recycling of textiles. Solving this problem is an example of the innovation potential in this sector, and is one that has the potential to release significant value into the economy.

⁴ Payne, Alice; Jiang, Xinru; Street, Paige; Leenders, Mark; Nguyen, The Ninh; Pervan, Simon; et al. (2024). Keeping Clothes Out of Landfill: A landscape survey of Australian consumer practices. RMIT University. Report. <https://doi.org/10.25439/rmt.27092239.v2>

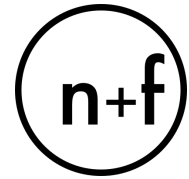
⁵ Raworth, K 2018 Doughnut Economics

⁶ Clothing \$16.5b, footwear \$6b, fibre \$6b, uniforms \$1b, industrial textiles \$1b+ (Ibis, Statista, AWI, Cotton Aus, market intelligence)

⁷ Market intelligence

⁸ <http://www.nacro.org.au/wp-content/uploads/2018/01/NACRO-Fast-facts-for-website.pdf>

⁹ <https://www.abs.gov.au/ausstats/abs@.nsf/Products/4655.0.55.002~2013~Main+Features~Chapter+4+Waste?OpenDocument>



The intrinsic value of the materials that currently go to waste

For every \$1 of material recovered from a textile through recycling an additional \$50 to \$100 can be potentially contributed to the economy by turning it into a new fashion product¹⁰. It follows that the total annual value of recoverable textile materials that are going to landfill around Australia of \$500million¹¹ can contribute up to \$25billion to \$50billion value through the full value chain of the fashion industry. Economic development and job creation has the potential to be achieved across all the stages; recycling, manufacturing, design, production, retail and product stewardship.

Recycling

Within Australia textile materials commercial recycling solutions are in their infancy. Waverley Mills is the only Australian company that is recycling waste textiles back into new textile consumer products, and there are few companies investing in research and development, such as Blocktex¹², Waverley Mills¹³ and Planet Protector¹⁴. Circular recycling industry initiatives exist at scale in other sectors, such as electronic waste¹⁵, demonstrating that through innovation and investment there are economically sustainable solutions to material waste.

Reuse and repair

Overseas, significant value creation has been achieved through new business models that focus on garment repair and reuse (*Rent the Runway*¹⁶ and *The Renewal Workshop*¹⁷). It is estimated that the value of this segment in the US fashion market

¹⁰ Based on the conversion of a recycled PET fibre with market value A\$1.60/kg (fibre2fashion.com) into a finished product that has retail value of \$60 to \$120 per kg (equivalent to a t-shirt that retails for \$12 to \$24 (Kmart t-shirt Mar 2021)).

¹¹ Australia's total amount of textile waste going to landfill is equal to 600 million kg of total textile waste less 100 million kg that is exported to developing nations, based on a base material value of \$1/kg.

¹² <https://www.blocktexx.com/>

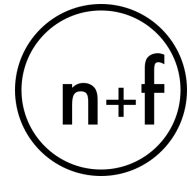
¹³ <https://waverleymills.com/collections/recycled>

¹⁴ <https://planetprotectorpackaging.com/about/>

¹⁵ <https://www.environment.gov.au/protection/waste/consumers/recycling-drop-off>

¹⁶ <https://www.renttherunway.com/>

¹⁷ <https://renewalworkshop.com/>



was US\$28billion in 2019 and it is expected to grow to US\$64billion by 2024¹⁸. In Australia a small number of companies, such as Rntr and GlamCorner, have developed similar business models but they are still few in number and relatively small in scale. This is a part of the industry that has the potential for significant growth in the short to mid-term given the experience overseas.

Value adding to agriculture and the production of fibre

Australia is a major global producer and exporter of premium wool fibre, valued at \$3.6billion¹⁹ in 2021–22. Most of this is destined for luxury fashion products around the world. Very little value is added to this high value fibre before it leaves the country, apart from some scouring and top making. By taking a circular economy approach to the processing of wool, coupled with the modern consumer’s desire for clarity around provenance, new opportunities will emerge to further process this fibre in Australia, such as an increase in top making, scouring, spinning, textile and garment manufacture. Value created by spinning a raw wool fibre into a commercial yarn has a value-add factor of approximately 3.5 times²⁰, increasing to a factor of 30 if the fibre is processed into a garment and then sold. This means that the annual wool clip from Australia has a potential value of \$12.6billion if 100% of it was to be processed locally and sold as yarn, and \$108billion if it were all converted locally to garments.

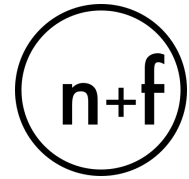
The current context: the textile industry is moving towards a circular economy

In the last decade both the global textile and fashion industry and its consumers have become more aware and engaged in a push toward more sustainable outcomes for its products. We also have the unique example of the world’s longest living culture on the lands of Australia through its First Peoples who have successfully used circular economy practices within communities for more than sixty thousand years.

¹⁸ <https://www.thredup.com/resale/#resale-growth>

¹⁹ <https://www.agriculture.gov.au/agriculture-land/farm-food-drought/meat-wool-dairy/wool#:~:text=Australi a%20is%20one%20of%20the,as%20among%20the%20world's%20best>

²⁰ Based on wool fibre price of A\$13/kg (EMI wk 39 2021), yarn price of \$45/kg (Market) and simple pullover price of \$129 per unit (Country Road wms Mar 2021).



Many companies already demonstrate a commitment and investment in this change and others a readiness to take action²¹. This industry-based momentum aligns with all the aims of a National Circular Economy Framework²² and ReMade in Australia²³, to maximise the value and minimise waste across all stages of the life cycle of materials.

Until recently smaller independent fashion and apparel businesses have been leaders within Australia in the transition to a circular economy. These have included zero waste design and manufacturing techniques²⁴, regenerative farmed materials²⁵, recycling of technical materials, and systems for takeback, repair and reuse of textiles²⁶. These smaller, innovative companies have also played an important role in educating consumers.

In more recent years, through pressure from environmental groups, the media and consumers, the larger volume-driven fashion businesses have started to shift their focus to prioritise environmental outcomes. This is evident from the broader adoption and consideration of lower impact chemical and material inputs²⁷, as well as the increase in availability and uptake of sustainable accreditations and certifications²⁸ through their global supply chains .

Research²⁹ undertaken in 2019 showed that Australia's major fashion brands and retailers are concerned about textile waste volumes and the lack of current available

²¹ <https://worldcirculartextilesday.com/signatories/>

²² <https://minister.dcceew.gov.au/plibersek/media-releases/delivering-future-remade-australia#:~:text=At%20its%20heart%2C%20this%20policy,standards%20for%20products%20and%20materials.>

²³ <https://www.dcceew.gov.au/environment/protection/waste/consumers/remade-in-australia>

²⁴ <https://szn.com.au/collections>

²⁵ <https://www.woolmark.com/fibre/woolgrowers/vic-tiverton/>

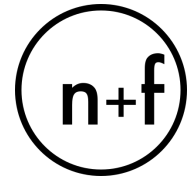
²⁶ <https://abch.world/pages/care-repair-wear-program>

²⁷ <https://www.kmart.com.au/cotton>

²⁸ <https://www.bestandless.com.au/corporate-social-responsibility>

²⁹ Boulton, McCallion, & Curtis 2019

<https://lens.monash.edu/2021/03/31/1382982/coming-full-circle-on-fast-fashion-for-a-sustainable-future>



solutions in the local market. The research also showed that a number of local brands have undertaken significant investment in this area; in knowledge acquisition, relevant training for staff (ie. circular material selection), as well as a commitment to collaborative development through involvement in industry working groups across academic research and government policy teams. Australian universities and research organisations are active across the full spectrum of the textile and fashion ecosystem and all aspects of the circular economy, and they have the local expertise to guide and support the implementation of policy. This includes the fields of agriculture, material and fibre chemistry, all aspects of processing and finishing, textile engineering and manufacture, systems and product design, materials recycling, garment care and repair, re-manufacturing, and consumer behaviour regarding garment ownership.

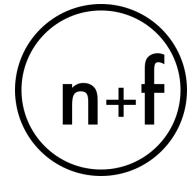
Recommendations

Textiles provide an opportunity for a significant economic boost to Australia through a circular economy approach to their stewardship.

Prioritising textiles in the circular economy can be based on scientific and technological developments, the innovation of new business models, new advanced methods of textile manufacture and through creative ideas and new designs. This growth would be complemented by a reduction in economic and community costs that are currently associated with waste textile materials.

The following recommendations are offered:

1. Prioritise textiles as a target material within the scope of the Australian Government's Circular Economy commitment.
2. Set textile specific targets (beyond apparel to include household-, industrial- and geo-textiles) and staged goals that define the change pathway.



3. Include textiles in relevant strategy development and active programs (eg Remade in Australia³⁰) across Australian government programs including procurement policy development.
4. Develop a roadmap to ban textiles (ie. finished goods) from landfill and incineration.
5. Invest in targeted data on textile waste streams in Australia.
6. Provide a textile focus in the funding of innovation in technology, recycling, manufacturing and business models in the emerging textile circular economy.
7. Include textiles in business and consumer education programs.

Now + Future

www.nowandfuture.com.au

Aleasha McCallion | Dave Giles-Kaye | Kirri-Mae Sampson

³⁰ <https://www.dceew.gov.au/environment/protection/waste/consumers/remade-in-australia>