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Submission to the Productivity Enquiry: Circular Economy Opportunities in Australia

Focus: Textiles and Clothing

Overview

The textile industry is often viewed through the lens of fashion, yet it fundamentally impacts health, hygiene, and safety everyday for all Australians. With over 800,000 tonnes of textiles discarded annually in Australia, the sector significantly contributes to waste. This submission responds to the Productivity Commission's enquiry into the opportunities and challenges for transitioning to a Circular Economy, with a focus on the textile sector. A shift toward circular practices is crucial to sustainably managing resources and mitigating landfill dependency.

Drawing on over 25 years of manufacturing and supply chain expertise, as well as insights from a recent Winston Churchill Trust Fellowship on zero-waste textile practices working at scale now, this submission covers observations and opportunities for Australia to recognise this sector as part of our pivot to a circular economy. Including leveraging its sustainable cotton and wool production capabilities, and capitalising on our natural advantages to become a leader in textile circularity, combining on-shore and offshore opportunity. Establishing a robust circular economy policy is essential for driving sustainable transformation within the textile industry and the broader economy.

The inquiry documents note the focus on 'mining, construction, manufacturing, agriculture and waste management' as key categories for action, identified in the CSIRO report as the largest opportunity for impact, but they are activities, not product or ingredient categories.

Circularity happens in ingredient categories, eg. glass, metal, plastics, organics (food, beverage) timber, paper, natural fibre, etc. If we truly are more circular in 20 years, we will be mining our waste, not virgin earth, construction and manufacturing sectors will be using ingredients of all these categories, to make products from designed for disassembly and reclamation. These ingredients; timber, metal, glass, plastic, natural fibre, etc. may be coming from a combination of novel circular processes, and in some cases, regenerative agriculture, they will be used in systems designed in such a way that resource recovery is much easier and more efficient than it is now. We need to know the volumes of the ingredients and understand the industrial process commonalities to identify the logical start points for circular economy infrastructure development.

[1] www.fullcirclefibres.com
[2] see www.sdc.co.uk
[3] For Contributions to work on antipathogenic medical gown research with Western Health, UoM and Doherty Institute
[4] Textile Circularity, what's working now at scale, and what could work in Australia. Report available late November 2024.

The Role of Textiles in the Economy

Textiles, spanning an almost infinite array of designs, fibres, prints, accessories, and uses, epitomize the complexity of a consumption-based economy. Retailers such as Bunnings or Kmart showcase thousands of products: plastic, paper, electronic, metal, timber, textile etc sourced from intricate, complex, global supply chains. Successfully transitioning to a circular economy where these items are recovered and repurposed to retain material value, will require equally complex and varied networks of processing, logistics, and service providers. Textiles, of all fibre types, from natural to synthetic and high performance, are used day in day out, in a myriad of ways in each of the sectors of focus for this enquiry; mining, construction, manufacturing, agriculture and waste management.

Simply categorizing waste into broad industrial streams could lead to continued downcycling, incineration, and disposal rather than high-value resource recovery.
This submission calls for detailed, multi-tiered approaches to understanding, reducing, managing and remaking from our waste. While the recent CSIRO Report on national stocks and flows provides a foundation, it lacks the granularity needed to develop actionable business cases, or even to see the potential in many sectors. A fantastic example of the level of work we need to do was recently completed by InvestNL[5]. See Fig. 1 from their report.

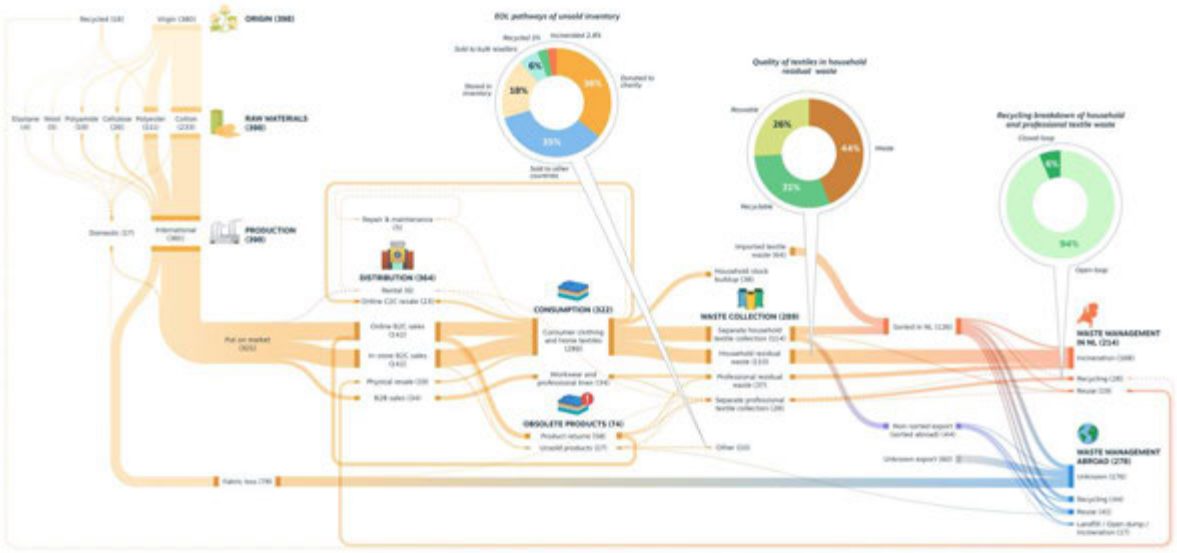

Figure 1 Invest NL Textile Stocks and Flows

The Australian equivalent of this diagram, with the total volumes represented in this entire diagram show up as barely visible lines on those in the CSIRO report. See Fig 2.

[5] https://www.metabolic.nl/projects/data-driven-impact-investment-opportunities-in-circular-textiles/

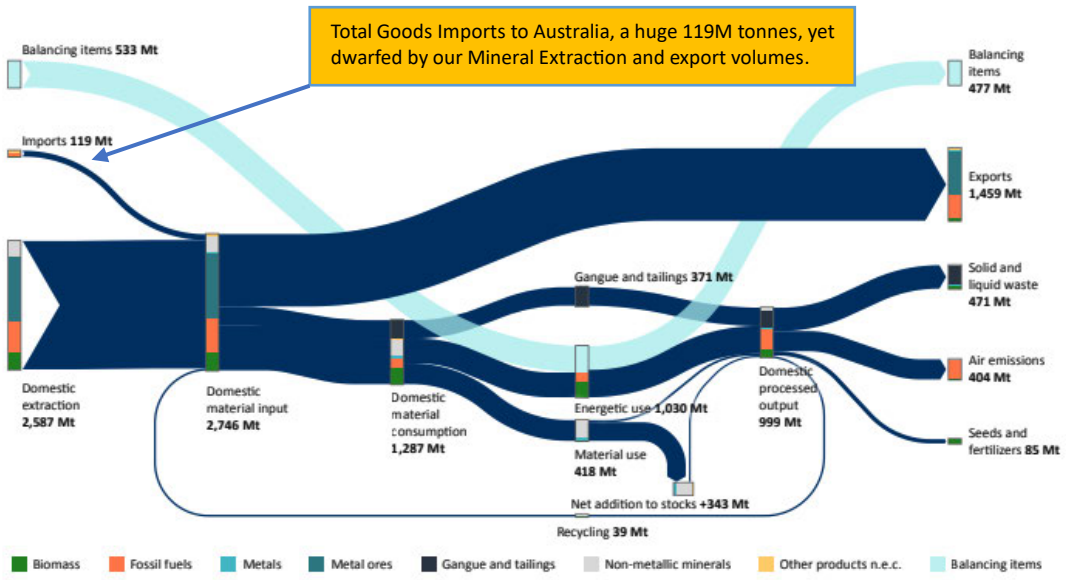

Figure 2 – Material flows through the Australian economy in 2019. The displayed units are million metric tons (Mt).

Figure 2 Australian total Stocks and Flows, CSIRO Circularity Report

We are not policy making with an eye on the detail, and if we can't be bothered to look closer than a high level view, we are missing the rich variety of real practical opportunities to activate the circular economy.

Retail is Detail – so is circularity.

Enterprises processing as little as little as 500kg through to 500,000 tonnes annually could make a prosperous impact, especially in small and medium-sized enterprises (SMEs), which often process in manageable volumes, of 1000-5000 tonnes p.a. Employing dozens or maybe hundreds.
It's going to take all sorts. The goal is to build an ecosystem of enterprises that create high-value, regularly used products to make it worth recovering feedstocks rather than focusing solely on processing costs and hoping a market can be found for some low value grey mush.

Currently, we have some understanding of our textile flows in apparel, from the work done to inform the development of Seamless[6], see Fig. 3.

[6] https://www.seamlessaustralia.com/news/roadmap-to-clothing-circularity

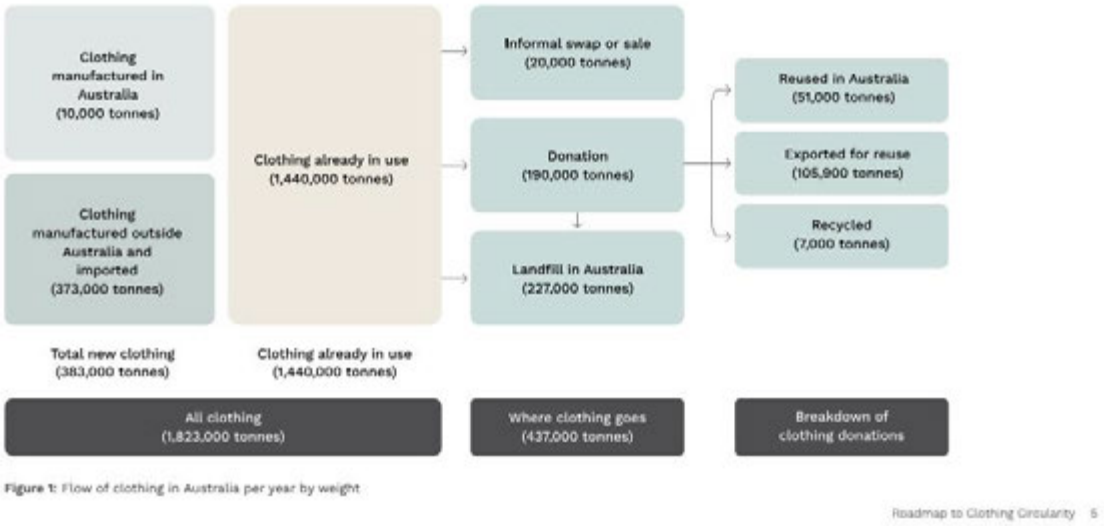

Figure 3 Australia's Apparel Flows, 2019.

However the detail of what fibres, combinations, and market categories these are in, are still fragmented by market segment not product type when we look at policy level. Builders buy timber stud, and nails, whether they are building homes or offices. The same goes for cloth in garments. There are common ingredients, which can be commonly managed and aggregated in circular material flows. Policy making must recognise this if we are to be effective.

These figures in Fig 3 may not mean much. 227,000 tonnes currently heading to landfill is the equivalent of 908 Million T-shirts. That is not nothing, or not worth bothering with, just because we mine and export resources in millions of tonnes instead of thousands of tonnes. It's still huge volumes to landfill, and there are viable opportunities in tackling them no matter their share of the problem.

Pathways to a Circular Economy in Textiles

1. Rethinking Product Lifecycle

Circular economy strategies can be structured around the 9Rs framework, with each "R" addressing a different stage of the product lifecycle:

- **Refuse**: Design products to reduce need.
- **Rethink**: Design for versatility and longevity.
- **Reduce**: Drive efficiency to lessen demand.
- **Reuse**: Encourage rental and multi-use products.
- **Repair**: Promote product alteration, repair, and adjustment.
- **Refurbish**: Repurpose and upcycle existing materials.
- **Remanufacture**: Enable textile-to-textile recycling to recover valuable ingredients.
- **Repurpose**: Downcycle items for alternative uses, such as insulation.
- **Recycle**: Convert textiles back to feedstock for new fibre creation.

Government support is vital for developing enterprises across these stages, whether sector-specific or cross-sector. A zero-waste, circular system will more likely resemble a network of

localized, diverse organizations than a few large processors. This approach requires shifting from consumption toward custodianship of resources. It's also critical to realise government, or government funded services are the most regular and reliable users and procurers of textiles, and therefore producers of textile waste too. Health, aged care, emergency services, emergency response, school uniform.

Fantastic examples of local recycling and upcycling solutions are:

- Substation 33 in Logan, QLD. Or;
- Homie in Melbourne, Victoria.

2. Opportunities in Textile Circularity

A. Expanding Circular Practices Across Sectors

Circular business models, such as repair, reuse, rental, and recycling, thrive among SMEs globally and present significant potential in Australia, especially in high-value niches. Fostering these models could catalyse long-life, zero-waste systems in the Australian textile industry.

B. Developing Domestic and Export Markets

Australia's sustainable cotton and wool production provides an advantage in adding value through recycling and fibre blending. Creating an onshore recycling loop, for some of our textile waste, while fostering partnerships, for example, in South Asia and India could establish a market for verified, sustainable Australian-made and remade textiles.

C. Integrating Circular Economy with Manufacturing

Circular Economy opportunities and policy are inextricably linked to manufacturing policy. In short:

there is no Re-Manufacturing without Manufacturing.

Achieving textile circularity requires strategic manufacturing infrastructure, much of which is the same for the linear and circular economy, weaving cloth is the same whether the yarn has virgin or recycled content.

Policy needs to support local production systems designed for reuse and recycling. Current innovations, globally, in textile circularity and sustainability, are led by SMEs producing 1,000-5,000 tonnes per year, which may seem minor when looking at our waste pile, but represent the foundation of a viable onshore circular economy. This potential must be prioritized by policy and infrastructure support. They often won't show up as patents registered, or VC raised, or spin offs from Universities, they'll show up as solutions in action on the ground. Industry gradually evolving and adapting.

Identifying opportunities to get textile circularity scaling here, sits with understanding our underlying civic textile demand, in addition to the Invest NL example, NYC Council published

a study completed of their procurement across all departments of textiles. Published and shared as a playbook for all.[7]
This report noted how much they don't know about their supply chains, and that to tackle their own government procured textile waste alone, will require industrial strategies, funding and support to get local circularity started. No-one is going to invest in infrastructure that serves retail and fashion alone, as it's still very profitable to be selling stuff that ends up in landfill. Consumer goods markets are far too ephemeral, and the product is always changing, so it's so much harder to actually tackle and create value from too.

Key Barriers to a Circular Textile Economy

1. Complex Recycling Processes

Textile recycling options are often limited and challenging for consumers. Yet we actually have a very engaged population, keen to do the right thing, exemplified in the volume that is donated to charity or for resale, the engagement with container schemes like COEX, and the popularity of Redcycle. However, policies should accept this technical complexity, and design policies to support many SMEs rather than a few huge projects. Collection and sorting is already established in networks that gather sort, sell locally, and offshore a lot of textile waste. This part of the market is now being covered by the Seamless EPR, the scope of this organisation needs to and expand schemes to cover all apparel categories, uniform, government & corporate. They are all garments, their suitability and value for recycling is related to their ingredients, assembly and design rather than market segment.

Noting – nothing needs inventing for textiles to be circular now. Technology both old and new can be applied to a vast portion of the waste we create. This is a systems innovation challenge (paperwork) of implementation not invention.

2. Regulatory Challenges

This falls into 2 categories
B2C imports: Fragmented regulations have hindered comprehensive waste processing, and the rise of global online shopping often circumvents regulatory frameworks. Policies, such as a weight-based tax on low-value imports, no matter the customs class, could mitigate these impacts, supporting local businesses and responsible purchasing.

Environmental Management:
Waste definitions : rules around defining genuinely hazardous or dirty waste v clean feedstock. The certification and regulation about storing and managing waste, can end up clumsily capturing businesses that are dealing with clean garments or linen that is beyond use, no different to what's been sat in your wardrobe for years. The challenges vary across jurisdictions.

Composting and bio-digestion innovation: Rules around municipal composting vary region to region and state to state. The pace of change in designing for biological circularity means we need to be able to tackle this with an innovative attitude to those working in this space. Some things are just not going to be re-sold, like underwear, if we don't want it to go to

[7] NYC Report download link https://a860-gpp.nyc.gov/concern/nyc_government_publications/j098zg04d?locale=en

landfill, or incineration, we need to be design it for composting, or some sort of nutrient recapture. We have to be able to work from fundamental first principles. Rules are in place to prevent poor practice, but we have to find ways to facilitate novel best practice too.

A group of us have been contributing to the development of a world first. A standard for compostible textiles. Australian Standards are hosting the process, Deakin IFM have researchers investigating the impact of natural fibre breakdown on soil health, and several of us from industry, micro businesses, are contributing, pro bono, as best we can to assist the first iteration, to be usable by industry as a start point. We need mechanisms to support this work financially.

3. Insufficient Government Understanding for (re)Manufacturing SMEs.
The high costs of real estate, compliance, and multiple social and product certification can stymie SME growth. Putting a few tick boxes in a procurement specification is not going to drive change. You have to engineer the system to be in balance, product and process engineers and designers need to be at the heart of this if we are going to foster change.

We can't procure our way to a new industry the way we currently go about it. The way we procure textile items in general for public sector use embeds bare minimum compliance rather than leading best practice. We need to be prepared to innovate on the processes we use to procure. We have to be prepared to engage and work with industry experts, rather than the management theory of reducing everything to a sanitised arms length process 'anyone' could manage.

Australia's manufacturing sector must be viewed as a promising field rather than dismissed due to labour costs, which now play a much smaller role in many manufacturing operations. So much of textiles production and many sectors are now high tech and very low labour, the same goes for being able to work with re-manufacturing. This doesn't mean we'll be suddenly making everything for ourselves, it does mean we can be pragmatic and responsive to opportunities as they come. We need to be agile enough to recognise them on their merits and the outcomes of reducing our waste and climate footprint. Combinations of local, regional and global collaborations are going to deliver the circular economy in practice. I've lost count of the number of times I hear 'we don't make anything' or 'we can't do that.' What a ridiculous state of affairs to be in, how did we allow this to become our degault narrative? We can, and do, make amazing products all the time, we're just blinded by the mega tonnes of fossil fuels, minerals, and staple food and fibre we export, clouding our perception.

We need to face the fact we make investing in manufacturing infrastructure and businesses a lot less appealing than other asset classes, like real estate and tech. The Risk to Reward ratios need to make it first choice not last choice. Manufacturing is not suited to VC, and much PE, it scales in a linear way, you have to make more if you want to sell more. It needs investors with a mindset in decades not years, who love being part of making great products.

It's infrastructure, but often needs to be projects in the $5-50M space not the >$100M which means it's too small to bother with for traditional institutional infrastructure investors. We could be building recycling and re-manufacturing capability at viable scale for

the price of a feasibility study in their world. Indeed, we could have several textile to textile recycling facilities for what's been spent just setting up the NRF!

4. Co-benefits of Textile to Textile recycling and closing the loop re-manufacturing on-shore.

Essential Supply chains:

We currently can't even make a bandage, or sand bag from scratch in this country. We have nearly all the processes here, we're missing yarn spinning.

The Productivity Commission report into essential supply chains, briefly noted PPE, which is a tiny fraction of the textiles that keep the country running, clean and healthy every day. It missed entire categories of essential textiles our communities and industries would come to a halt without very quickly.

These items are low value per unit, until they aren't there. Ask what a bag of saline is worth right now to a hospital having to postpone surgeons and elective operating lists?
Closing the loop for textiles would also give us some contingency capability that could pivot to critical product uses too.
We have to be able to be a bit more sophisticated when we value the capability we want to have, come what may. Global supply chains are being disrupted more often from weather & war. What's been reliable in the past may not be in the future. It's not a question of just the price per unit, but the cost of the consequences of completely running out.

Value Adding to Virgin Cotton and Wool Fibre:

Spinning yarn from our home grown fibre is currently limited to a few small scale wool spinners. This can be done more comprehensively with the same capability we could use to spin recycled fibres into yarn again. The opportunity to blend with our virgin fibre is a competitive advantage in this category. We have the waste and the virgin natural fibre in the same place.

The scale which would make sense, would be fractional in comparison to the volumes we export as raw fibre. This opportunity is about targeted capability to be agile, responsive and innovative, in complement to our fibre export sector, not huge commodity virgin fibre spinning to displace it.

Policy Recommendations and Strategic Actions

1. Establish a Comprehensive Regulatory Framework

A unified policy approach across material categories will encourage local recycling efforts. Clear regulations on textile imports, especially in B2C packages, are essential to level the playing field.
The Commonwealth is in denial if it doesn't see this needs to be tackled. The rise of Shein, Temu, Amazon and more means the locally based businesses, whether they make locally or source overseas, are losing market share, this challenge is growing. This isn't just a waste product issue, it's a packaging compliance issue and a product safety issue, whether textiles, plastic, batteries and more.

The UK charges VAT (20%) on every B2C satchel arriving, no minimum value. There are estimates 22% of Germany's imported garments now arrive in B2C satchels. The US is reviewing its De-minimis import legislation having identified $100Ms lost sales tax revenue due to this shifting market structure.

2. Strategic Placement of Infrastructure
Investments in waste management infrastructure within and near urban centres would ensure efficient processing. Policy changes should also ease regulatory barriers for reprocessing facilities, particularly for clean waste streams and small scale community based enterprises collecting, sorting , repairing and upcyling.

3. Develop New Metrics for Circular Economy Success
Traditional productivity metrics do not reflect the benefits of circular practices. New indicators, such as reduced landfill waste and enhanced community resourcefulness, could provide a more accurate measure of circular economy effectiveness. The circular economy working well, will likely show up as a drop in traditional GDP. Which really could be better described as Gross Domestic Extraction, given the access to landfill required for it to keep growing in our current consumer driven economy.

4. Skill Development for Repair and Reuse
Expanding training in repair and alteration, both as community initiatives and job pipelines, could foster a culture of repair, reducing the demand for disposable goods. We need to decouple thinking that all trade skill training needs to lead to a paid work. Most of the materially productive mending, especially with apparel, happens in the home, between friends or community groups. It won't show up as GDP, it'll show up in lower sales.

Do we really pay attention to the value lots of skilled manufacturing SMEs bring to our economy?

A study[8] over 5 years conducted by University of South Australia looking at the artisan and expert manufacturing skills in our 'craft' economy found this:

"The project found that in 2021 Australia's craft economy employed 116,538 people (1.1% of the total workforce) and generated $AU19.2 billion gross value added (1.0% of the total). By comparison, Australia's craft economy is slightly larger in size and impact than the sports economy, which in 2016–17 supported 128,000 jobs and contributed $AU14.5 billion to gross domestic product (KPMG 2020)."

How many would imagine that our sport economy delivers less to GDP that our expert makers? – the devil, or delight, is in the detail. We must be prepared to look, or we'll let golden opportunities trickle away. If we are to look for our opportunity for prosperity beyond selling raw materials and ingredients, this is where we need to pay attention. It won't be all big projects, with a few big stakeholders, it'll be hundreds, even thousands of small and medium scale place based solutions.

[8] https://www.unisa.edu.au/research/creative-people-products-places/research-projects/the-value-of-craft-skills-to-the-future-of-making-in-australia/

What would our capability look like if we spent on master craftsmanship training and skills development what we spend on subsidising stadiums and sports events and mega events? When we look to what this means for the circular economy, the more refined and clever uses of small amounts of waste upcycling into lovely items, the higher the skill required to take those left overs and make something beautiful and valuable.

Yet this ability to create beauty from waste is in all our heritage, a beautiful patchwork quilt, a sashiko jacket, a shaker style table, a fair isle border pattern on a sweater. A gorgeous handbag from left over leather.

5. Implement Mandatory Extended Producer Responsibility (EPR)
A comprehensive EPR scheme for end-of-life textile management is essential, long term.

Voluntary schemes, such as "Seamless," and the ABSC (Australian bedding stewardship scheme) are positive beginnings, mandatory coverage would ensure all apparel products are addressed. Noting the structure of both Seamless, and ABSC are such that as they become established, the learning of what's effective could be pivoted into regulation.

There's no doubt mandatory regulation will need to happen eventually. Globally every single business in product and retail knows that voluntary 'anything' for sustainability gets trimmed back, or slowed down with economic downturns. In this global market, there is always someone somewhere in the race to the bottom, they are the competition. Since tariffs and quotas came down globally in 2000, the idea of unlimited trade sharing wealth, has also unleashed unlimited exploitation of people and planet in vast parts of textiles and clothing supply chains. We are in a structural textile waste deficit, our circular economy initiatives are not keeping pace with the increase in overall volumes consumed, and modern slavery is a bigger problem than it was 25 years ago when brands were first being shamed. This applies as much to the items procured for public and corporate use as it does for fashion.

Proposed Action Plan

1. **National Textile Analysis**: Conduct a detailed national textile stocks-and-flows analysis to identify high-impact circularity opportunities. (see Fig 1)
2. **Cross-Sector Circular Economy Framework**: Integrate circular principles across various material categories to support cohesive recycling and reuse strategies.
3. **Border Regulations for Low Value Imports**: Introduce a tax on low-value B2C imports to strengthen local recycling efforts and reduce the environmental impact of global e-commerce. GST and perhaps a weight based waste levy too, needs to apply to ALL goods coming in, not just clothing and textiles.
4. **Urban Planning for Circular Economy**: Encourage urban planning initiatives that permit and embed circular economy infrastructure where people are. Eg. COEX in QLD.

5. **New Metrics for Circular Economy**: Develop and use alternative success metrics to guide policy adjustments. GDP is too clumsy and out of date for working towards a world in balance. Volumes to landfill, volumes of unwearable waste exported, emissions reduction.
6. **Overlay Circular Economy opportunities with essential supply chain contingency capability**. Where can we look to use agile set ups to serve both?
7. **Skills Mastery, for Manufacturing and Re-manufacturing.** Vocational education and fostering community skills sharing, needs a re-think if we are to foster excellence and mastery in 'thin markets.' It's a national investment in resilience, agility and systems change.

Conclusion

To lead globally in circular textile practices, Australia must invest in coordinated actions, regulatory reforms, and strategic infrastructure and skills training. With strong support, the Australian textile industry can evolve into an innovative, zero-waste economy that leverages natural advantages and meets global environmental standards. The question is not whether Australia will embrace this transformation, but when and how decisively it will capitalize on the associated opportunities.