GLOBAL CIRCULAR NETWORK SUBMISSION FOR THE PRODUCTIVITY COMMISSION INQUIRY INTO AUSTRALIA'S OPPORTUNITIES IN THE CIRCULAR ECONOMY

To Department of Climate Change, Energy, the Environment and Water.

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BACKGROUND.

Further to two previous detailed presentations in 2024 to Minister Plibersek, Department of Climate Change, Energy, the Environment and Water and John Thwaites, Climate Works Australia I am submitting information on the Australian-made circular economy solution for textile-based products along with recommendations.

On 27 February 2025 I made a submission to the Statutory Review of the Recycling and Waste Reduction Act 2020 (The Review) to the Department of Climate Change, Energy, the Environment and Water.

The Review included formal submissions into a range of inquiries on waste and resource recovery, feedback and reports provided to the department, and engagement with the Circular Economy Ministerial Advisory Group.

GLOBAL CIRCULAR NETWORK. CIRCULAR ECONOMY SYSTEMS

In 2023, approximately 924 million pieces of unwanted clothing in Australia ended up in domestic landfills, with around 36 million clothing items disposed of in landfills outside Australia. In 2020, I launched Australia's first *Circular Textile Waste Service* through a NSW EPA grant. We were unable to continue due to a lack of support and expertise understanding of circular economy systems specifically for textile-based products. This highlighted the necessity of regulations and a Digital Product Passport (DPP).

Subsequently the EU Commission has moved in this direction. Starting in 2024, the European Union will implement a regulation requiring nearly all products sold in the EU to feature a Digital Product Passport. This initiative, part of the *Ecodesign for Sustainable Products Regulation*, aims to enhance transparency across product value chains by providing comprehensive information about each product's origin, materials, environmental impact, and disposal recommendations.

CIRPASS-2 is an Innovation Action project funded by the European Commission's *Digital Europe Programme* creating a community of DPP stakeholders to facilitate deployment across different product sectors throughout Europe and beyond.

I actively participate in three Cirpass-2 *Expert Working Groups* led by the EU Commission, establishing standards for DPPs to meet regulations including to collect Life Cycle Assessment (LCA) data throughout a product's lifecycle.

CIRCULAR ECONOMY SOLUTIONS IN AUSTRALIA.

Government regulations in Australia are essential for managing waste at scale, reducing pollution, and creating equitable Extended Producer Responsibility (EPR) systems. These steps would connect and alleviate financial burdens on siloed councils, charities, and recyclers. Industries contributing to significant emissions and pollution must be held accountable through robust regulatory frameworks.

As a business owner collaborating with global partners, the Global Circular Network offers the world's first washable, bulk-scanning RFID thread DPP connected to a cloud-based app, and QR Code ID with NFC capabilities.

Please see below my four recommendations to the Australian government to integrate DPPs to connect government policies including the *National Circular Economy Framework*, the *National Kerbside Collections Roadmap*, and the *Recycling and Waste Reduction Act 2020*.

The aim is to improve materials productivity and efficiency in ways that benefit the economy and environment. The CSIRO estimates Australia's circularity rate at approximately 4.6%, lower than the global average of around 7%.

CIRCULAR ECONOMY SOLUTIONS

This submission recommends that the Australian government establish a dedicated Committee of experts for textile-based products to connect the supply chain with reverse logistics value chains.

Textiles require a specific, whole-systems circular economy strategy to address their impact on waste, pollution, and emissions.

A specialised Committee would determine how textiles intersect with and impact key national policies, including:

- *Recycling and Waste Reduction Act*
- *National Circular Economy Framework*
- *National Kerbside Collections Roadmap*
- *National Environmental Management Plan on PFAS*
- *National Plastics Plan (addressing microplastic filters in washing machines)*
- *Low-Value Import Tax Threshold*

Additional recommendations include integrating and regulating voluntary *Product Stewardship Schemes* to include all textile-based products such as apparel, uniforms/workwear, PPE, footwear, bedding, interiors, furniture, and vinyl.

GOVERNMENT REGULATIONS

Without regulations, the textile and waste industries operate largely unchecked. Clothing manufacturing is the third-largest contributor to emissions, and both sectors significantly impact pollution.

Government regulations incorporating DPPs are essential to managing the complexity of textile waste and improving efficiency. Washable RFID bulk-scan DPPs capable of staying with the product throughout its entire lifecycle are the only smart tech solutions capable of scaling textile waste management while ensuring a financially sustainable, data-driven circular economy.

The *2020 National Product Stewardship Investment Fund* allocated $10.5 million to establish 24 schemes, with 10 focused on textile-based products. Unfortunately, they remain unregulated and prioritise recycling over Extended Producer Responsibility (EPR). The use of DPPs would integrate EPR schemes using smart tech to support an increase in repair, redesign and remake initiatives to exponentially increase emissions mitigation, local profits and collect full lifecycle data. EPR systems achieve far greater emissions reductions than landfill diversion alone.

Current solutions put forward by the existing policies do not address circular economy systems nor use of smart tech solutions as we see being used in the EU. This oversight puts Australia at a disadvantage and unable to meet environmental, financial and circular targets. Without regulation and DPPs, there is no

effective strategy to curb the influx of products, connect products to EPR, correspond with waste-diversion, or address "forever chemicals" which pose long-term environmental and health risks.

4 KEY STRATEGY RECOMMENDATIONS

1. **Unifying Committee**.

Establish a new "umbrella" committee to unify existing policies and Product Stewardship Schemes in order to oversee textile-specific circular economy systems including resource pathways, measurable mitigation of emissions and pollution and financial reporting.

Policy Alignment and circular economy integration. Unify regulations to integrate textiles into a coordinated Circular Economy (CE) framework.

2. **New committee Appointment**.

Appoint the *Product Stewardship Centre for Excellence* alongside additional textile specific circular economy experts including the Global Circular Network, as an independent governing body to coordinate policies.

3. Mandatory DPPs

- Support the *Global Circular Network* to integrate washable RFID thread DPPs for B2B network connectivity along with providing QR Codes for B2C communication, marketing, social media.
- Require DPPs for textile-based imports and exports to track materials, product lifecycle, and for EPR through the R-Cycling sectors before accurate sorting for safer recycling (domestic and offshore).
- Align with global best practices, including EU Commission and California's standards, to ensure compliance and transparency.

4. Regulatory Oversight and Accountability

- Committee to include connection to IT systems through a “digital bridge” including CSIRO Data61 to provide measurable metrics and “feed” AI LLMs.
- Implement strict monitoring for exporters (companies, NFPs, and charities) to ensure quality control and EPR commitments.
- Require exporters of recycled material and “waste” to provide external data verification on offshore sales, recycling, final disposal.

Regulation & Compliance

- Apply DPPs to monitor products from design, import, EPR, waste reduction & recycling. Integrate strategies with the *Circular Economy Framework* and *National Kerbside Collections Roadmap*, align policies for circular pathways.
- Enforce traceability, repairability, longevity, and circularity in product life cycles.
- Use DPPs to sort and divert PFAS, ensuring safer recycling processes.

Smart Tech for Waste & Product Tracking

- Use RFID THREADS® DPP technology to improve supply chain visibility, enhance sorting, and create safer recycled feedstock.
- Optimise recycling, repair, and remanufacturing using accurate, real-time data.
- Integrate AI to analyse whole-systems for textile-based products including circular design, export metrics and determine best-case circular pathways.

HOW AUSTRALIA TAKES RESPONSIBILITY FOR ITS WASTE

- Create financially sustainable CE model connected through DPPs
- Use smart tech to support brands to increase ROI plus circulate products through local EPR networks to increase jobs and profits. Support local recycling initiatives.
- Collect verifiable data from stakeholders + regulate imports and exports
- Collect taxes from verified data, monitor stakeholders, offer rebates to SMEs, NFPs, charities

In 2024, the *Australia Institute* named Australia “world's largest per capita consumer of textiles, with an average of 56 new clothing items purchased per person each year, equating to over 300,000 tonnes of clothing sent to landfill or exported annually”.

The Victorian government reports that "around 95% of clothes sent to landfills could be reused or recycled." However, a recent RMIT University study found that "many donated garments are of such poor quality that they hold little financial benefit for charities."

CREATING A CIRCULAR ECONOMY

Every product already connects with various stakeholders and has multiple 'owners'. By adding a single smart RFID THREADS® thread, it can connect supply chains, consumers, and resource recovery reverse logistics value chains as it moves throughout a circular economy.

Import and Export Efficiency. RFID DPPs enable efficient bulk scanning for imports and exports:

- Creates a collaborative, affordable, and equitable reporting system for real-time data collection
- App connects via a digital bridge with brands' SCM systems
- Open source to all stakeholders ensuring automated, machine-readable per-product data

The DPP is a Product Passport, not a People Passport. Data collected will support:

a. Brands (add EPR to increase jobs/profits, increase brands ROI, capture efficient, verifiable data for compliance reporting)

b. Provide accurate government metrics (council, state, federal, global)

c. Sorting for safer recycled feedstock (divert hazardous chemicals)

d. Supporting AI, designing out waste and pollution, helping brands support best-case circular solutions based on metrics

PROTECTING HUMAN AND ENVIRONMENTAL HEALTH.

Regulations on Hazardous Chemicals

- Update the *National Environmental Management Plan on PFAS* to mandate DPPs for tracking and EPR strategies to detect PFAS and hazardous chemicals in local & imported textile products eg. uniforms, workwear, activewear, outerwear, interiors, furniture.
- Mandatory DPPs should track and help mitigate over 4,000 "forever chemicals"
- DPPs can detect and divert hazardous chemicals in bulk, ensuring safer recycled feedstock

Accelerating Microfibre Pollution Controls

Update the National Plastics Plan to fast-track mandatory microfibre filters in washing machines ahead of the current 2030 timeline. Europe has already implemented this regulation in 2025

Regulating Ultra-Fast Fashion

Close *Low-Value Import Tax Threshold* tax loophole for ultra-fast fashion brands to curb unregulated imports, protect local markets, and prevent excessive landfill waste

CIRCULAR ECONOMY EXAMPLE: THE *JEANS REDESIGN PROJECT*

The Jeans Redesign project by the *Ellen MacArthur Foundation* demonstrated how denim jeans can be designed and manufactured for circularity. Between 2019 and 2023, the initiative led to 1.5 million pairs of jeans being produced using circular design principles.

Key circular features include: Rivet elimination to improve recyclability, Safer chemicals (which will soon be tracked via washable DPPs), 87% post-consumer recycled content.

Adding an RFID thread to denim allows for extended product life and prevents waste from ending up in landfills. This simple affordable addition has significant environmental benefits:

- Avoiding landfill for 1.5 million jeans prevents 4,500 metric tons of CO_2e emissions
- Reselling or reusing these jeans avoids an additional 50,100 metric tons of CO_2e
- Total carbon offset: 54,600 metric tons CO_2e
- roughly equivalent to removing **11,869 petrol cars** from the road for a year.

Taking the 2 billion pairs of jeans produced annually worldwide and applying the same circular economy principles at scale could result in:

- 6 million metric tons of CO_2e emissions avoided from landfill
- However this extends to 72.8 million metric tons of CO_2e offset through ***both*** reuse and landfill avoidance
- roughly equivalent to removing **15,826,087 petrol cars** from the road for a year

DPPs ADD FULL EPR. It's crucial to note that beyond landfill diversion, through resale or reuse, product life extension offers an enormous 1,113% increase in emissions mitigation. By adding a washable RFID DPP we increase mitigation through, to-date, uncalculated efforts achieved from repair, redesign, remake and reuse strategies all before recycling.

CREATING WHOLE SYSTEMS NETWORKS

Implementing washable RFID technology can enable large-scale traceability, waste tracking, data collection, and coordination throughout the product lifecycle, significantly enhancing waste management, resource recovery, and cost efficiency.

Many textile-based manufacturers prioritise the lowest-cost options, leading to misconceptions that QR codes and NFC tags suffice for circularity and reporting. However, printed QR codes are unlikely to remain intact with a product throughout its lifecycle. They are inefficient and ineffective as they require direct visual scanning, cannot be bulk-scanned, and do not facilitate ongoing data collection. This is the same with NFC that may or may not be connected to a consumer's bank account. RFID systems remain separate from consumer connection for security.

Collaboration across sectors; include all textile-based Product Stewardship Schemes such as Bedding, Footwear, Furniture and Seamless along with the Australian Fashion Council request for a fashion DPP pilot. By connecting PSS we link the networks, especially interconnected resource recovery sectors that currently operate in silos alongside disparate councils and State governments and offshore providers.

Using smart tech tools is essential to connecting networks, collecting accurate metrics and enabling groundbreaking AI tools. This includes directing emissions reduction strategies and identifying environmental hotspots, such as integrating renewables in high-emission manufacturing and transport sectors.

COST-EFFECTIVE MECHANISMS

RFID for B2B: Business, NFPs, charities can access *Global Circular Network* App via affordable and accessible hand held and fixed RFID readers to bulk read and add new data to products:

- Design teams add traceable materials info, certification, mitigation strategies
- Manufacturers/factories
- R-Cyclers (rent, resell, repair, redesign, remake)
- Sorters (reporting, clean feedstocks)
- Recyclers (bio, chemical, mechanical)
- Transport (design, factories, ports, sorting/recycling centres, laundromats) plus robotics
- Data and metrics (databases, marketing, AI, IoT, robotics)

DPPs provide a cost-effective mechanism to focus on the 'upstream' stages of a product (design, import, and manufacturing) plus connect the downstream resource recovery value chain (EPR, recycling and export).

COMPLIANCE AND ENFORCEMENT

Use of RFID DPP connected to IT systems for monitoring and supporting compliance reporting, receiving measurable metrics for change. Enforcing compliance is an important function of any regulated scheme. Many circular economy experts including the Product Stewardship Centre for Excellence have stated that greater regulations are required.

The EU Commission's enforceable regulations under the *2020 Circular Economy Action Plan* ensure compliance, prevent greenwashing, and verify environmental targets through DPPs to support whole-systems, especially for SMEs, which make up 99.8% of the fashion sector. Australia can adopt similar measures, providing long lead times to implement regulations based on best-case metrics through DPPs.

RECOMMENDATIONS TO SUPPORT CIRCULAR ECONOMY IN AUSTRALIA

I recommend that the new Committee collaborate with government policymakers and all textile-based product sectors plus smart tech operators to connect with RFID DPPs and QR Code ID. Partner with government and industry, including CSIRO and Data 61, to support accurate metrics and develop groundbreaking AI tools.

Combat greenwashing, enforce regulations, create equitable, affordable, inclusive circular economy systems. The only effective way to stop greenwashing and restore consumer trust in sustainability claims is by collecting accurate data throughout a product's entire lifecycle. DPPs offer traceability, repairability, usability, recyclability, and full circularity for the cost of a few cents.

Australian brands selling in the EU will soon be required to implement DPPs and submit compliance data. Actively implementing EPR strategies with the assistance of smart tech helps quantify progress towards the government's goal to reduce greenhouse gas emissions by 43% below 2005 levels by 2030.

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