

Evaluating product stewardship benefits and effectiveness

SUMMARY REPORT















UTS, ISF and the Product Stewardship
Centre of Excellence acknowledge the
Gadigal People of the Eora Nation, the
Boorooberongal people of the Dharug
Nation, the Bidiagal people and the Gamaygal
people upon whose ancestral lands our
university stands. We would also like to pay
respect to the Elders both past and present,
acknowledging them as the traditional
custodians of knowledge for these lands.

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What is product stewardship and why do we need it



Product stewardship aims to manage and reduce the environmental and human health impacts of products and materials throughout their lifecycle. This aligns with the core principles of a circular economy – design-out waste and pollution, keep products and materials in use and regenerate natural systems.

Addressing impacts across all elements of the product lifecycle – design, manufacturing, usage, and post-consumption (as outlined in Figure 1 below) – is key to meeting the objectives of the Australian Government's Recycling and Waste Reduction Act 2020 (RAWR Act).

Everyone who designs, makes, sells, and uses a product has a role to play, however, the primary responsibility for managing impacts across the product's lifecycle rests with those placing products onto the market. This includes brands, importers, and retailers.

Product stewardship includes extended producer responsibility (EPR)¹. EPR looks to extend a producer's financial responsibilities to the collection, recycling, and safe disposal of products at the post-consumption stage of the lifecycle.

This research shows how product stewardship action is effective in reducing the environmental and human health impacts of products and materials. It also found that there is limited awareness and understanding of the concepts among businesses and the general population, and sub-optimal engagement².

This highlights the need for increased efforts to explain concepts and demonstrate how product stewardship action can create positive environmental, social, and economic benefits.

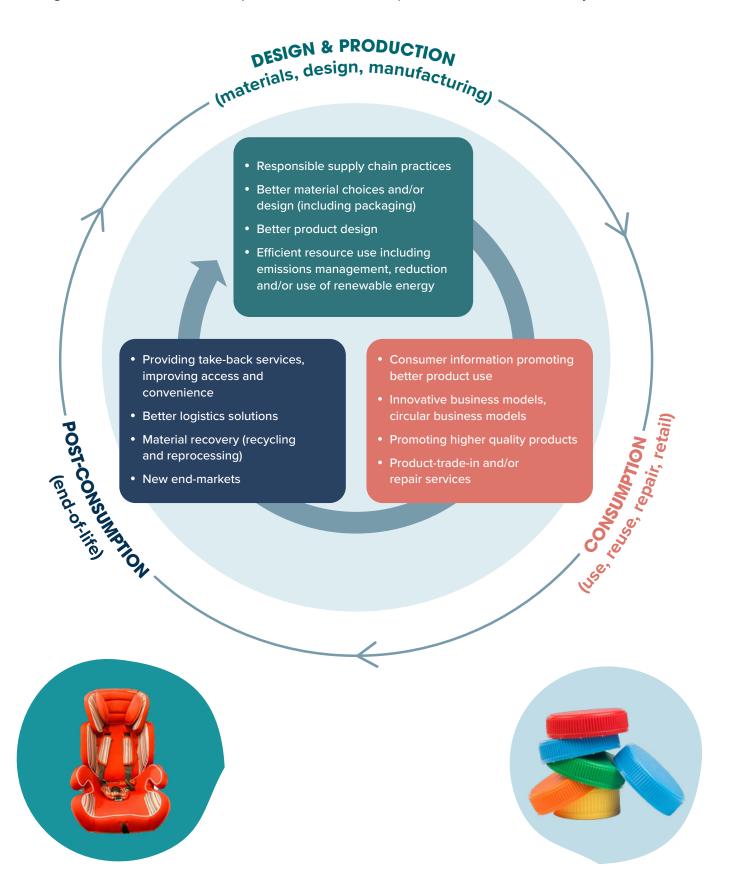
Coupled with the right policy settings and financial incentives, there is an opportunity to increase business and the general population engagement with product stewardship. This is essential for the transition to a circular economy.



¹ OECD (2016), Extended Producer Responsibility: Updated Guidance for Efficient Waste Management, OECD Publishing, Paris.

² For businesses, engagement relates to either participating as members of collective schemes, as champions of individual business activity, or as users of product stewardship services. The general population engages as users of product stewardship services, e.g. dropping off discarded products or packaging at designated collection points.

Figure 1. Product stewardship activities across the product and material life-cycle





This is the first comprehensive evaluation of product stewardship and EPR activity in Australia.

The project delivers against the *National Waste Policy Action Plan 2019* commitment 3.3: Evaluate the effectiveness of product stewardship and extended producer responsibility activities across the country, to help inform future efforts.

Effectiveness is defined as how well product stewardship initiatives are meeting their objectives to minimise the environmental and human health impacts of products, packaging, and materials. This has been assessed by evaluating the environmental, social, and economic outcomes, or benefits, delivered by various product stewardship initiatives and comparing these to the initiatives' stated objectives.

Federal Product Stewardship Legislation

The Recycling and Waste Reduction Act 2020 (RAWR Act) creates a framework for reducing the human and environmental health impact of products. The act aims to:

- reduce the impact of human and environmental health of products
- realise the community and economic benefits of taking responsibility for products
- develop a circular economy
- contribute to Australia meeting relevant international obligations.

To achieve these objectives, the RAWR Act allows for the regulation of the export of waste. It also allows for three regimes relating to product stewardship. These are designed to encourage or require manufacturers, importers, distributors, and other persons to take responsibility for products. The product stewardship regimes are:

Voluntary arrangements – The Australian
 Government can accredit arrangements that
 further the objects of the RAWR Act. This includes
 arrangements that effectively manage the
 negative environmental impacts of products

- throughout their life. Accreditation provides authorisation to use the Commonwealth's product stewardship logo. B-cycle is an example of an accredited arrangement.
- Co-regulatory arrangements Co-regulation allows industry to administer its own arrangements. The government provides legislative backing to enable the arrangements to be enforced. The National Television and Computer Recycling Scheme (NTCRS) is an example of a co-regulatory arrangement.
- Mandatory arrangements Mandatory arrangements refer to legislation that requires industry to act in a certain way. This includes the Product Stewardship for Oil Program.

Under the Act, the Minister must publish an annual priority list. The list signals products and materials the Minister is considering regulating. Rules for co-regulatory and mandatory arrangements cannot be put in place until a product has been on the list for at least 12 months.



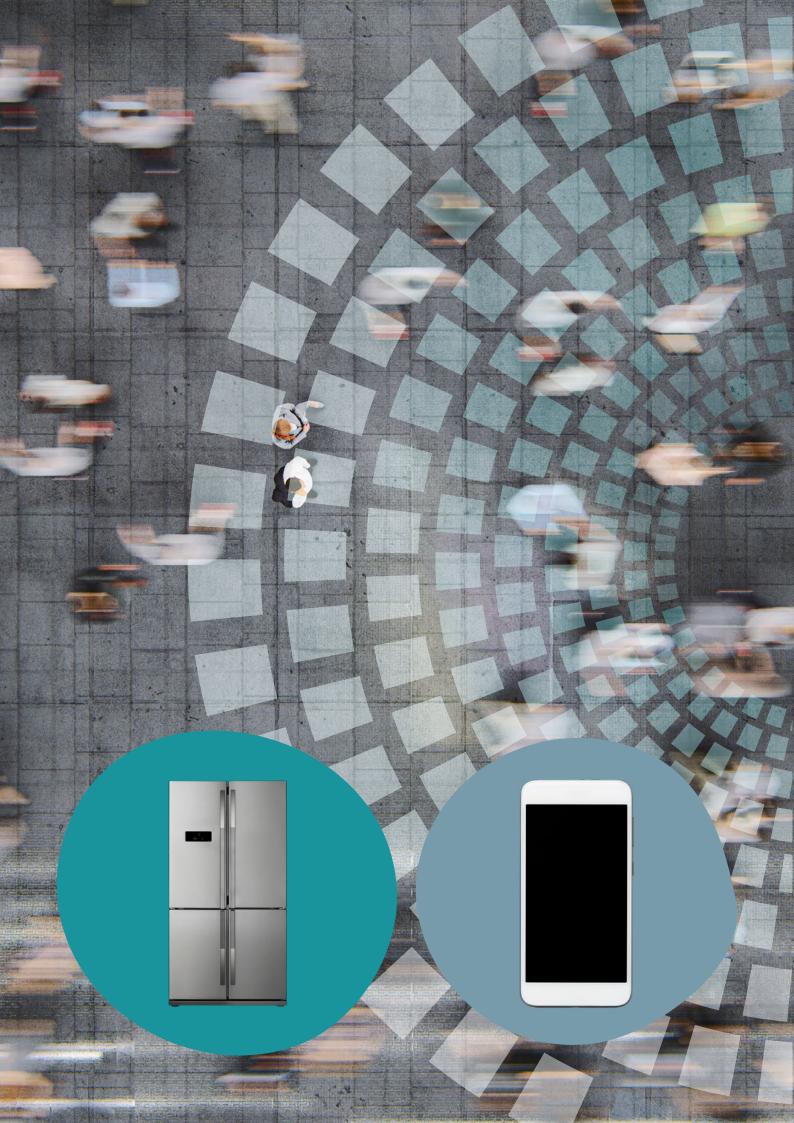
Methodology

To evaluate product stewardship benefits and effectiveness, the research:

- Compiled and analysed data on product stewardship initiatives, stakeholder awareness and engagement in Australia (see data sets below)
- Designed a classification system and framework for evaluating the benefits and effectiveness of product stewardship initiatives

Five new data sets informed the analysis:

- 1. Publicly reported objectives and environmental, social and economic performance data for 106 product stewardship collective schemes and individual business initiatives (which can be viewed online at the Product Stewardship Gateway www.gateway.stewardshipexcellence.com.au (Environmental, social and economic benefits of product stewardship initiatives in Australia).
- 2. Survey of 601 Australian businesses to assess awareness and understanding of product stewardship, and how and why businesses are implementing or engaging in initiatives as a participant in the value chain, or users of services (Product stewardship benefits assessment 2022: Business report).
- **3.** Survey of 1001 Australian residents to assess awareness and understanding of product stewardship and gauge the effectiveness of product stewardship initiatives in communicating and engaging with the public as users of services (**Product stewardship benefits assessment 2022: General population report**).
- **4.** Survey of 89 local government staff to assess awareness and understanding of product stewardship among staff and assess the nature of their engagement with product stewardship initiatives as a key actor (**Product stewardship benefits assessment 2022: Local Government report**).
- **5.** Interviews with 60 product stewardship actors and experts (i.e., those involved in or influencing scheme design and operation) to inform the evaluation of effectiveness and help determine how product stewardship can become more effective (Effectiveness and Benefits of Product Stewardship: Themes from 60 qualitative interviews).



Benefits and effectiveness of product stewardship



Product stewardship intiatives are delivering a wide variety of benefits including:

- Environmental eliminating hazardous materials, conserving resources and materials, preventing and reducing waste, and reducing greenhouse gas emissions
- Social improving workers' health and safety across the supply chain, and increasing accessibility to repair services or collection points for recycling
- Economic job creation, upskilling, reskilling, and creating new markets for recovered materials

The analysis of annual performance data and the survey findings found that high levels of industry or business investment and participation were essential for realising these benefits. For collective schemes, this ensured fair sharing of costs by industry. For individual business initiatives, this ensured sufficient allocation of internal resources. For most of the collective schemes assessed, regulation was viewed as necessary to achieve high levels of participation and investment.

Interview findings suggested that voluntary schemes can be more flexible in addressing changing market conditions, or the needs of members. Interviewees suggested that legislation can be less flexible owing to fixed income, operations, and targets. There is an opportunity to introduce greater flexibility and responsiveness in regulatory approaches for collective schemes.

Several interviewees expressed a pragmatic acceptance that regulation was the best solution for ensuring high levels of industry investment and participation.

Four additional characteristics of effective product stewardship were identified:

- Clearly defined objectives Measurable environmental, social, and economic performance indicators demonstrate benefits and allow for continual assessment of the effectiveness
- Good governance —This includes well-defined roles and responsibilities and ensures transparency through public reporting
- Use of financial incentives —to drive behaviour change of businesses, consumers, repairers, collectors, sorters, and recyclers
- Effective marketing —leading to high awareness and increased user participation

The analysis also identified several factors limiting effective product stewardship including:

- Low awareness and understanding of product stewardship
- · Inconsistency in reporting
- Overemphasis on end-of-life interventions
- Low rates of investment and participation in industry-led collective schemes

Product stewardship benefits



366,000 tonnes

19 initiatives collected more than 366,000 tonnes of used televisions, computers, mobile phones, tyres, hospital PVC, paint, beverage, and agricultural containers, batteries, sports shoes, and cosmetics



12,000

33 initiatives established over 12,000 collection and drop-off points for various products

2022

Product stewardship assessment framework



The framework for assessing the benefits and effectiveness of product stewardship was developed and refined through the process of compiling publicly reported environmental, social and economic performance data. The framework consists of 33 distinct performance indicators. These align with circular economy principles, the UNEP Sustainable Development Goals, and cover actions across the whole product lifecycle. The 33 indicators reflect the environmental, social and economic benefits of initiatives and are listed in *Tables 1, 2 and 3*.

Given the inconsistency and gaps in data collection and reporting, only a few of annual performance indicators could be aggregated. There were also limitations in assessing how effective initiatives are performing. For example, tonnes of waste products collected for recovery and materials recovered were not always reported in the context of total waste arising. Without this data, it is difficult to determine how effective the initiative has been in increasing recovery or diverting waste from landfill.

Table 1. Environmental performance indicators

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Environmental			
MATERIALS	Use of recycled content or materials	This indicator captures the use of recycled content in products and packaging, with the aim of reducing virgin material use, waste to landfill and to support expansion of markets for secondary materials	
	Use of renewable materials	This indicator captures the use of renewable materials in products and packaging (e.g. biomass-based) to reduce dependence on virgin materials	
	Eliminating the use of hazardous materials	This indicator captures actions related to the elimination of hazardous materials in product and packaging design, and the promotion of sound management of chemicals and hazardous wastes throughout the product lifecycle	
EFFICIENCY	Dematerialisation and improved efficiency	This indicator relates to improvements in the use of materials for production or use, including cleaner production and industrial symbiosis activities	
DESIGN & PACKAGING	Product, packaging and/or process design change	This indicator relates to product, packaging and/or process design changes for circularity, waste avoidance or reduction, resource recovery	
	Product longevity and durability	This indicator relates to product or packaging design changes to increase the average lifespan of products and components, to promote repair, reuse, component replacement	
	Sustainability information and labelling	This indicator relates to the provision of information and labelling; e.g. about the use of recycled materials, energy savings, product impacts across the supply chain, guidance on proper use or disposal	

Table 1. Environmental performance indicators continued

Environmental		
ENERGY, WATER, EMISSIONS	Energy use savings	This indicator refers to the energy savings as a result of efficiency improvements, changes in production, processes and product use, including efficient transport
場	Renewable energy	This indicator records the use of renewable energy in production, processes, facilities, retail locations, transport
	Water use savings	This indicator refers to the water savings as a result of efficiency improvements, changes in production, processes and product use
	Water recycling	This indicator refers to the use of recycled water or the adoption of technologies to recycle water before disposal
	Emissions reduction	This indicator relates to actions for carbon avoidance, sequestration, reduction or mitigation of GHG emissions, particulate matter and others
WASTE & RECYCLING	Waste collection volume	This indicator relates to the quantity (volume) of waste products, packaging or materials collected for recovery. Note: for Container Deposit Schemes, collection volume has been recorded as the volume redeemed or volume returned
	Collection rate	This indicator is defined as products, packaging or materials collected for recovery as a percentage of total products, packaging or materials entering the waste stream
	Waste diversion volume	This indicator relates to the quantity (volume) of waste diverted from landfill as a result of activities such as recovery, reprocessing, recycling, composting
	Recovery rate	This indicator includes material, nutrient or energy recovery as a percentage of products, packaging or materials entering the waste stream
ORGANISATIONAL POLICY, PROCESS & COMPLIANCE	Sustainable procurement	This indicator relates to sustainable procurement policies and actions of schemes or individual business initiatives, including contractual terms, supplier participation and providing sustainable products to clients and third parties
	Environmental risk management	This indicator relates to policies and actions designed to reduce exposure to climate change risk and extreme weather events, divestment from fossil fuels, reducing CO_2 footprint across supply chains











Table 2. Social performance indicators

Social		
ORGANISATIONAL POLICY & PROCESSES	Worker health and safety	This indicator records the organisational practices related to occupational and worker health and safety, such as OWH&S policies, training, partner and sub-contractor processes
	Governance, audit, monitoring and compliance	This indicator refers to codes of conduct and practices related to organisational governance, auditing, monitoring and compliance
	Sustainable supply chains	This indicator refers to supply chain practices such as standards to ensure health and safety of those working in supply chains, certifications, national and international regulations and practices for sustainable supply chains
POLICY ACTIONS	Actions to increase engagement with government for policy impact	This indicator considers specific actions by industry to engage with government for policy impact such as updates to legal and regulatory frameworks, standards, codes of practice and advocacy
PHYSICAL COVERAGE	Number of collection, drop-off points	This indicator relates to the number of collection and drop-off points for products and/or packaging
COMMUNITY OUTREACH	Engagement with Indigenous communities	This indicator considers actions to increase engagement with Indigenous communities through collaboration and awareness building
ÁS ÁS AS AS AS AS AS AS AS AS AS AS AS AS AS	Increasing accessibility in remote and regional areas	This indicator reports on the activities for increasing accessibility to product stewardship initiatives in remote and regional areas. Accessibility can be measured in terms of % of population covered, distance to collection points, number of collection points per population, or events conducted in regional and remote areas. Accessibility targets are set forth in the National Waste Policy Action Plan (2019) and through coregulatory initiatives such as APCO and the NTCRS
	Local recycling	This indicator refers to activities and technologies to promote local processing or recycling economies to manage waste locally and to support local employment in recycling, e.g. through social enterprises
	Community education and marketing	This indicator reports on awareness generation through community engagement, education, marketing and market research
	Equity and diversity in employment	This indicator relates to policies and actions for increasing indigenous employment and training, gender diversity, local job creation, working with or becoming a social enterprise

Table 3. Economic performance indicators

Economic		
INNOVATION	Research and development	This indicator measures Research and Development (R&D) activity through investment in R&D, number of projects undertaking new R&D, share of spending on R&D, funding of research programs and students
JOB CREATION	Direct employment	This indicator reports on the number of full-time equivalent (FTE) jobs created directly owing to the activities of the initiative
	Indirect employment	This indicator reports on the number of full-time equivalent (FTE) jobs created through the activities of partners, sub-contractors and supply chain actors associated with the initiative
INDUSTRY ENGAGEMENT	Market share, participation from producers, retailers	This indicator is a measure of the responsible entities actively engaged through the initiative relative to the total number of market operators, it can be expressed as percentage share of the market covered by participating entities
NEW MARKET CREATION	Creating new end-markets	This indicator relates to activities that contribute to the creation of new end-markets, e.g. by building demand for recycled products and materials and the expansion of markets for secondary materials







Diversity of product stewardship activity in Australia

To understand the breadth and maturity of product stewardship activity in Australia, a classification system was established to characterise product stewardship initiatives with respect to organisation type, regulatory and funding status, product focus, and lifecycle stage and objectives (environmental, social and economic).

Just over half of the 106 initiatives assessed were collective schemes with the remaining being individual business initiatives, with most being voluntary.

Types of product stewardship initiatives

Collective schemes

Multiple businesses placing similar products on the market work collaboratively to deliver product stewardship solutions that address industry-wide challenges. Collective schemes can be led by an industry association, a product stewardship organisation (PSO), or an industry collective. For example, MobileMuster provides a free mobile phone recycling program. The program is voluntarily funded by all major handset manufacturers and network carriers. Mobile Muster is managed by the Australian Mobile Telecommunications Association on behalf of industry participants.

Individual business initiatives

Led by a single business or brand, these are often managed internally and may involve other supply chain actors. They can include activities such as designing for circularity and providing opportunities for repair, reuse, sharing and takeback. Examples include Fairview's Ecoloop aluminium cladding recycling initiative and the Conscious Koala children's clothing subscription and rental service.

Product stewardship initiatives in 2022

99 initiatives were active, or in various stages of planning and development.

46 were individual business initiatives³ (all operating at time of assessment).

53 were collective schemes (37 in operation and 16 in development).

Most initiatives are voluntary.

14 initiatives are regulated – eight at a national level (i.e., Oil Product Stewardship, Refrigerant Reclaim Australia, NEPM Used Packaging, five individual approved arrangements under the NTCRS), six at a state or territory level (i.e., container deposit schemes).

Seven initiatives are governmentaccredited (two individual business and five collective schemes).

³ The list of businesses chosen for review was not exhaustive nor representative of all product classes or industries. The intention of including individual business action was to investigate the breadth and diversity of product stewardship activity by businesses across product and material classes, and lifecycle stages.

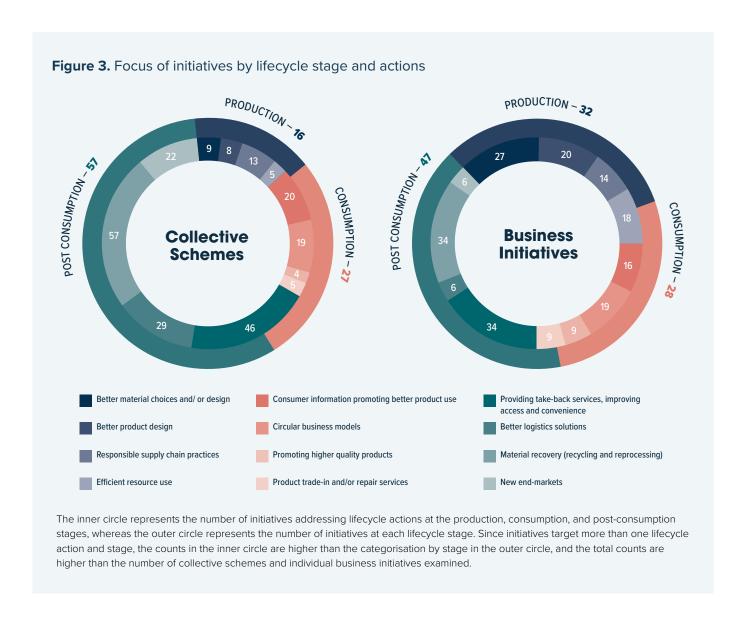
The product stewardship initiatives assessed encompass 31 product or material classes, with a major focus on packaging (28), electrical or electronic products (17), clothing textiles (9), furniture (6) and plastics (4). *Figure 2* provides a full breakdown.



Most initiatives focus on reducing impacts at the product's post-consumption stage by offering collection services and material recovery. Only one-third of these initiatives are active across all three stages of the product lifecycle.

Collective schemes were most active at the post-consumption stage. Individual business initiatives were more active at the design and production and consumption stages, focusing on better material choices, eliminating hazardous materials, and innovation in product and packaging design (see Figure 3).

An overemphasis on end-of-life interventions limits the opportunity to reduce environmental and human health impacts of products and materials across the whole lifecycle.







Individual businesses play an important role in driving innovation in product and packaging design to reduce the impact on environmental and human health



There is an opportunity for collective schemes to expand their activities **to prevent** waste generation at the production and consumption lifecycle stages

Limited awareness and understanding of product stewardship

Surveyed businesses and members of the general population were unfamiliar with the concept of product stewardship and circular economy. Businesses are more familiar with the terminology and concepts of sustainable product design and product take-back (See *Table 4*).

The general population expressed interest in sustainability and reducing environmental impacts of products. However, they had a limited understanding of product stewardship and related concepts. Only 11% of those surveyed indicated that they understand product stewardship somewhat or very well. This understanding is framed by traditional concepts of recycling and responsible disposal. Of those surveyed, the general population viewed consumers and local government as responsible for the disposal of products.

In contrast, local governments have a strong recognition of the terminology of product stewardship. This reflected high levels of engagement, however the focus of product stewardship for those surveyed was on end-of-life with only 30% associating the term with all lifecycle stages.

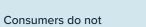
Table 4. Awareness and understanding of the concept of product stewardship

Key area		General population	Business	Local Government
Awareness of the term 'Product Stewardship'	% aware (heard of it to very well understood)	49%	50%	98%
Understand the concept of 'Product Stewardship' well	% who understand it 'somewhat well' + 'very well'	11%	19%	79%
Other concepts understood by the audiences	% who understand other terms 'somewhat well' + 'very well'	Sustainable product design – 33% Product take back – 22%	Sustainable product design – 44% Environmental Social Governance – 30%	Circular economy – 85% Sustainable product design – 81%

Opportunities to increase product stewardship activity



The low level of knowledge among businesses about product stewardship concepts and initiatives is limiting engagement both as actors and as users of services

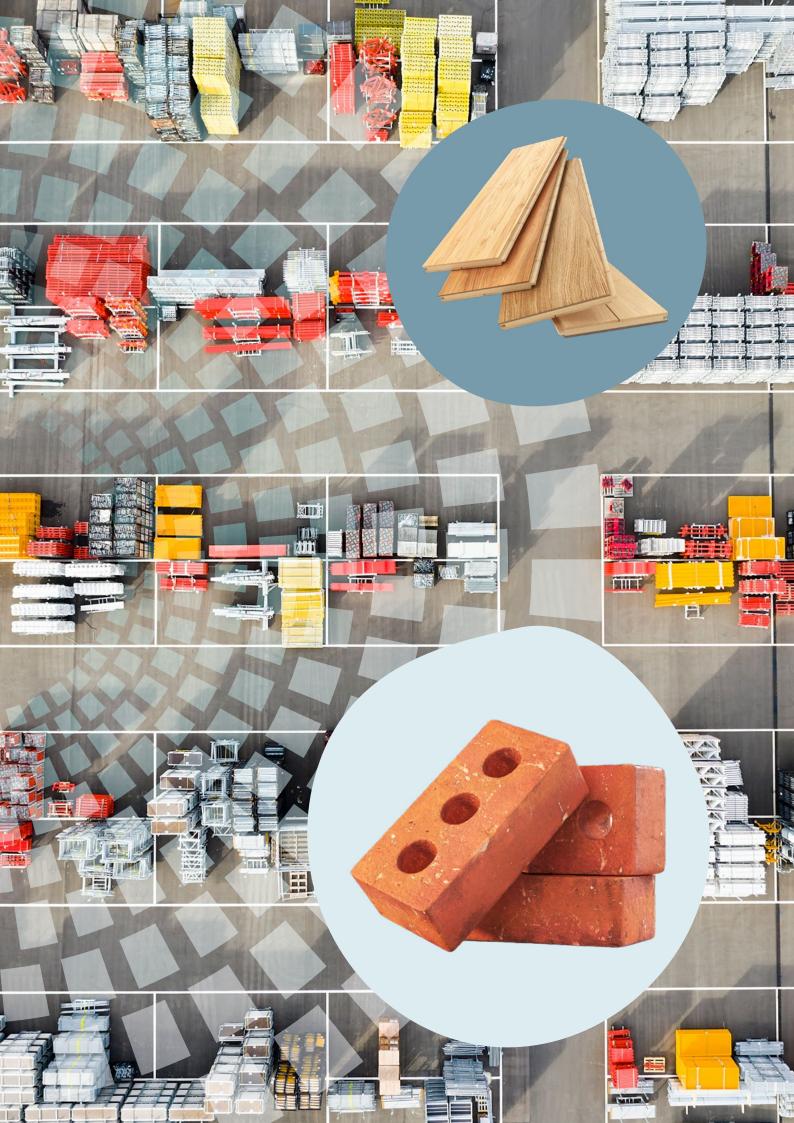


necessarily need to understand terminology to engage in a meaningful way



There is an opportunity to improve awareness and understanding across all three audiences

Connecting product stewardship and circular economy to the terminology of sustainable product design will likely ensure the message is more relevant to businesses and the public



Varied levels of engagement in product stewardship

The three audiences' engagement in product stewardship varies, reflecting their different roles and responsibilities (as seen in *Table 5*). As noted previously, businesses can engage as members of collective schemes, as champions of individual business initiatives or as service users. The general population engages as service users and local government as service providers, e.g., providing information to consumers or hosting collection points.

General population

Most (87%) of the general population have undertaken at least one product stewardship action by either recycling a used product or reusing items. Just over half report purchasing products designed to be more durable. Three quarters have engaged with at least one existing product stewardship initiative, with an average of three initiatives per person.

Engagement in specific product stewardship initiatives is most common with initiatives that are either well promoted, offer a financial incentive, or have good accessibility, especially those linked to other consumer interactions such as retail.

Businesses

Business-led product stewardship activity focuses on the design and production stage of the product lifecycle. Emphasis is on improving material choices and responsible supply chain practices.

Business involvement in product stewardship action is driven by economic reasons. This includes desire for financial sustainability, competitive advantage, or striving for good business practices. Other factors include consumer expectations, and internal company values.

Two-thirds of businesses have engaged with an existing external initiative. On average businesses engage with 1.5 product stewardship initiatives. Many businesses currently engaging in product stewardship do not perceive a direct benefit to their business. Changing this perception is important to increase engagement. This finding highlights a need to improve reporting on benefits particularly those aligned with best practice operations, brand reputation and consumer expectations.

Local government

Of those surveyed, local government engagement with product stewardship initiatives is much higher. This is because it aligns with their role in waste management and recycling of products and packaging. Local government staff participate in an average of seven product stewardship initiatives and play an important role in both promoting and facilitating consumer engagement.



 Table 5. Engagement with product stewardship

Key area		General population	Business	Local Government
Exhibit any engagement with product stewardship actions	Incidental or deliberate engagement as identified across a number of prompted questions	87%	96%	100%
Product stewardship actions commonly taken	Top actions consciously taken	75% have engaged with an initiative 66% reuse disposable items 56% purchase products that are designed to be durable	72% consider improved material choices 69% conduct responsible supply chain practices 64% have engaged with an initiative	98% have engaged with an initiative including 76% hosting collection points and 67% promoting 82% provide kerbside recycling 76% provide recycling and collection sites
Have engaged with an established product stewardship initiative	% who state they have 'engaged with' a prompted list of initiatives	75%	64%	98%
Barriers or reasons restricting engagement with product stewardship generally	Top barriers, negative factors or outcomes	51% cite lack of awareness of the concept of product stewardship. Awareness of existing initiatives is also lacking. 58% consider manufacturer/ producer and 43% say brand owners are far more responsible for managing product than their level of influence (16%)	50% had never heard of product stewardship. The concept is less understood compared to Sustainable product design and Environmental Social Governance (ESG) 26% say lack of knowledge is the key reason for not being involved 20% cite time and staff resources 18% say cost considerations are a barrier 44% that engage are unable to identify direct benefits to their organisation	Additional LG resources required (61%) Administrative burdens (59%) Financial impact (56%) especially associated ongoing or set up costs (28%) 29% cite accessibility issues being remote/ regional 21% say service does not exist in their area 19% point to Lack of support or buy in from stakeholders

Opportunities to increase product stewardship activity



For businesses, a lack of knowledge, resourcing concerns and cost considerations are key barriers that need to be specifically addressed. **Messaging for business needs to overcome concerns about cost implications** and highlight benefits aligned with best practice operations, brand reputation and consumer expectations



There is opportunity to encourage consumers to engage further through effective marketing of existing initiatives and ensuring ease of access to services



Local government will continue to play an important role in promoting and facilitating consumer engagement. There is an opportunity to **leverage the existing relationship between local government and consumers** to better promote and disseminate information about product stewardship initiatives to increase engagement.

Conclusions

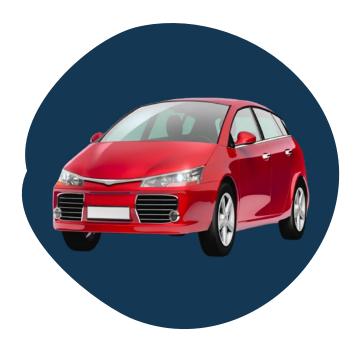
Product stewardship is an effective approach for managing and reducing the environmental and human health impacts of products, packaging, and materials throughout their lifecycle.

In Australia, the benefits of product stewardship initiatives are significant and wide ranging. It has promoted circular design, making products more durable, less hazardous, and more recyclable.

Product stewardship has led to improved production practices, contributed to CO₂ mitigation, and resulted in the diversion of waste from landfill and increased recovery of materials available for new manufacturing.

There are also significant opportunities to increase product stewardship activity, drive broader adoption, and create greater positive environmental, social, and economic benefit and realise a circular economy.





Further information

Additional detail on the research method, data and findings can be found in the following five data reports. Please contact the Product Stewardship Centre of Excellence to request these reports.

- · Environmental, social and economic benefits of product stewardship initiatives in Australia
- Product stewardship benefits assessment 2022: Business report
- Product stewardship benefits assessment 2022: General population report
- Product stewardship benefits assessment 2022: Local Government report
- Effectiveness and Benefits of Product Stewardship: Themes from 60 qualitative interviews

All data compiled for product stewardship initiatives and publicly reported environmental, social, and economic performance indicators is available on the **Product Stewardship Gateway** – www.gateway.stewardshipexcellence.com.au

