

MEASURING REUSE ACTIVITY AND IMPACTS IN NSW, 2022-23

Technical report
October 2024



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This project is an initiative of Charitable Reuse Australia and NSW Environment Protection Authority. This report was prepared by Rawtec.

Acknowledgment of Country

We acknowledge the Traditional Owners and Custodians of Country through Australia and their spiritual relationship with Sea and Country. We pay our respects to them, their cultures, and Elders past and present.

Contributors

We extend our sincere gratitude to the individuals and organisations who contributed to this study, as listed in the Introduction section of this report. Your support has helped make this significant project possible.

Important notes

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Definitions

Term	Definition
Post-consumer donations	Items donated by consumers to reuse organisations (both not-for-profit and commercial).
Handled for Reuse	Sum of all items handled by reuse organisations. Excludes items sent to landfills in Australia.
Resold in NSW	Items sold by reuse organisations to local consumers.
Donated to NSW welfare recipients	Items donated by reuse organisations to welfare recipients.
Exported	Items exported overseas by commercial organisations to be sorted.
Exported and Reused	Sum of all items exported and go to reuse destinations (including reuse and upcycling).
Locally Repaired	Items repaired by reuse organisations when handled for reuse. These activities occur instore, in Australia.
Internationally Repaired	Items repaired overseas. These items have been exported by Australian reuse organisations to be sorted and then repaired.

Executive summary

About the Project

The NSW reuse sector is a vibrant ecosystem, rehoming millions of secondhand goods annually. In an Australian first, this project adopted the National Reuse Measurement Guidelines from Monash University to quantify this reuse activity and associated impacts. The project is an initiative of Charitable Reuse Australia in partnership with NSW EPA. Rawtec was engaged to conduct the research, supported by expert advisors, a survey support team, and a Project Working Group comprised of representatives from several reuse organisations across NSW. The study demonstrates the benefits delivered by the sector, including job creation, consumer savings, carbon emissions reductions and more.

Project Methodology

To deliver the project, we conducted a comprehensive survey targeting reuse organisations in NSW to gather data on their activities and impacts. The survey, developed following Monash University's National Reuse Measurement Guidelines, was distributed to reuse organisations identified by the project team, and promoted through key networks. We received surveys from organisations representing over 600 reuse shops in NSW. The data collected included detailed information on reuse categories, employment, revenue, and social impacts. We reviewed, validated, and anonymised the data, converting it into metrics such as transaction averages and employment figures. These findings were further refined and validated with the Project Working Group. This information was extrapolated to estimate overall reuse activities, economic value, social benefits, and environmental impacts.

Key Findings

The study covered reuse activity across charity shops, not-for-profit reuse organisations, secondhand clothing stores, rent-a-racks, reclaimed timber shops, and commercial reuse collector/exporters. In 2022-23, these organisations:

- **Volume of Reuse:** Reused an estimated 107.7 million secondhand items.
- **Employment Impact:**
 - **Paid Employment:** Generated paid employment for approximately 1,535 full-time equivalents (FTEs), including 348 FTEs for individuals facing barriers to employment.
 - **Paid Employment compared to recycling and landfill:** Generated 25 times more jobs than recycling and 81 times more than landfill (on a per tonne basis).
 - **Volunteers:** Employed 3,306 FTE volunteers across NSW.
- **Economic Value:** Sold or donated approximately \$243 million worth of second-hand goods that were reused in 2022-23.
- **Cost of Living relief:** Saved the NSW community an estimated \$432 million through selling and providing secondhand goods, compared to buying new items.
- **Contributions to social and environmental purposes:** Raised an estimated \$51 million in funds that was reinvested into social and community programs and initiatives.

- **Training and Skill Development:** Provided an estimated 158,000 hours of training to their paid staff and volunteers.
- **Community engagement:** Facilitated 16 million transactions between the public and reuse shops.
- **Environmental Impact:**
 - **Waste Diversion:** Diverted an estimated 49,900 tonnes of products from landfill to reuse.
 - **Resource Conservation:** Avoided the direct consumption of 22,000 tonnes of virgin materials contained in displaced products¹.
 - **CO₂-e Emissions:** Saved an estimated 343,000 tonnes of CO₂-e, equivalent to removing 141,000 passenger vehicles from the road.
 - **Water Savings:** Saved approximately 16,000 megalitres (ML) of water, equivalent to the volume of 7,000 Olympic-sized swimming pools.
 - **Land Use:** Saved about 192,000 hectares of land, equivalent to the size of 269,000 soccer pitches.

These estimates are based on an Environmental Conversion Factors study by Lifecycles, examining the environmental impacts of products displaced by reuse. This study was commissioned by Charitable Reuse Australia on Rawtec's recommendation and further improves methods for estimating environmental benefits. Consequently, the data presented here updates the information provided in the June 2024 Executive report.

- **Repair:** Reuse organisations repaired up to 3,900 tonnes of items for reuse, with most repair occurring offshore, accounting for up to 8% (by weight) of all items reused.

Data gaps/limitations and future research opportunities

To further improve and expand reporting on reuse activity, we recommend the following actions:

1. Large volumes of secondhand items are exchanged via online marketplaces, such as eBay and Facebook Marketplace. We sought to collect data from these marketplaces via the survey, however, these organisations did not provide data for this project. We recommend that Charitable Reuse Australia and the NSW EPA continue engaging with these organisations to secure data for future surveys.
2. In future surveys, expand the scope to include additional reuse activities from pawnshops, salvage yards, commercial secondhand furniture shops, and council reuse shops.
3. Conduct research to obtain more data points for the weights of various 'Other reuse items'. This could be addressed by expanding future surveys to include salvage yards (see Recommendation 2).
4. Commission research to develop a comprehensive set of displacement rates aligning with Tier 3 product categories in the National Guidelines for Measuring Reuse.
5. Undertake study with a sample of reuse organisations to improve their methods and processes for tracking repair, public education, and outreach activities.

¹ Secondhand products do not displace new products on a one-for-one basis. This estimate accounts for displacement rates, and only includes the avoided virgin materials in the displaced end products. Additional volumes of virgin materials are avoided upstream (e.g. offcuts from producing textiles) but were not quantified in this study.

6. Update the National Guidelines for Measuring Reuse to further improve their useability based on lessons from this Project, recently developed ECFs, and incorporate any updated research for displacement rates.

Conclusion

The reuse sector in NSW significantly contributes to sustainable development by generating economic value, creating jobs, supporting community programs, and achieving considerable environmental benefits. These findings highlight the importance of supporting and expanding reuse activities to enhance their positive impacts on society and the environment.

1. Introduction

1.1. About this project

The NSW reuse sector is a vibrant ecosystem rehoming millions of secondhand goods annually. This study estimates reuse activity and impacts in NSW in 2022-23. The project demonstrates the immense benefits that the sector delivers, including employment, consumer savings, raising funds for charitable programs, carbon emissions reductions and more.

1.2. Who is behind this study?

This project is an initiative of Charitable Reuse Australia in partnership with the NSW EPA. Rawtec was engaged to lead research for the project with support from the Project Working Group, Expert Advisors and Survey Support Team, and input from reuse organisations (listed below).

Project partners	Charitable Reuse Australia and NSW EPA
Lead researcher	Rawtec
Project working group	Omer Soker (Charitable Reuse Australia), Alejandra Laclette, Mitchell Jones, Marcelle Psaila, and Sarah Le (NSW EPA), Kirsten Junor (Reverse Garbage), Martin Nordstrom (Salvos Stores), Tony Rallis, Katie Revie, and Alex Dimou (UTURN), Kat Heinrich and Mark Rawson (Rawtec), Annie Walker (SSROC), Yolanda Saiz and Phil Coyte (Vinnies).
Project expert advisors	Assoc. Prof. Ruth Lane (Monash University), Prof. Tommy Weidmann (University of New South Wales), Tim Grant (Lifecycles), and Dr. Joe Pickin (Blue Environment).
Survey support team	Carrie Hamilton, Susan Goldie, and Salma Ghoraba
Organisations that participated in research	1 World Charity Shops, ADRA Australia, Agape Outreach, Among the Trees, Anglicare (NSW), Australian Red Cross, Bega Valley Shire Council, Bower Reuse & Repair Centre, Cancer Wellness Support, Circle Paints, Dumped and Ditched, Fairhaven, Garage Sale Trail, Green Connect, Lifeline Broken Hill Country to Coast, Lifeline Direct, Lifeline Harbour to Hawkesbury Sydney, Lifeline Macarthur Western Sydney, Lifeline Mid Coast, Lifeline Northern Beaches, Lifeline South Coast, One Ten Enterprises, Pambula Imlay House Op Shop, Pottsville Beach Neighbourhood Centre, Resource Recovery Australia (trading as Reviva), Reverse Garbage, Salamander Bay Recycling, Sap Impex, Save the Children, SCR Group, St Vincent de Paul Society (NSW), St Vincent de Paul Society (Canberra/Goulburn), Statewide, Ted Noffs Foundation, The Hope Community Social Venture, The Reconnect Project, The Salvation Army, The Social Outfit, The Uniform Exchange, The Wayside Chapel, Thread Together, UTURN (King Cotton Australia), Venla Fashion, Willing and Able Foundation, and Zara's House (Refugee Women and Children's Centre)

1.3. How was data collected and reported?

The project adopted the National Reuse Measurement Guidelines (Monash University) to quantify reuse activity across NSW and triple bottom line impacts. Data on reuse volumes was collected via a survey with NSW reuse organisations using point-of-sales data where available and extrapolated to estimate reuse activity in NSW. In addition, a subset of data was collected on repair prior to reuse. This technical report provides background on the project methodology and key assumptions for estimates.

1.4. What reuse activity is covered in this report?

This project estimates reuse activity across NSW reuse organisation types listed in Table 1. This includes charity reuse/op shops, other not-for-profits², secondhand clothing shops, rent-a-racks, reclaimed timber shops, and commercial reuse collectors/exporters. These organisations are referred to throughout the report as 'reuse organisations'. Secondhand items sold via online marketplaces were separately reported (see Section 8.1).

Reuse activities not captured in this study include pawnshops, salvage yards commercial secondhand furniture shops and council reuse shops. The project survey could be expanded in future years to capture these additional volumes of reuse activity.

Pre-consumer items are new items sold/donated from retailers and manufacturers to organisations for resale. Data on pre-consumer items was excluded from the project analysis because these items have not previously been worn or used, and therefore are not technically counted as 'reuse'.

Table 1: Reuse organisation types included, separately reported, and not captured in study

Reuse organisation types included	Separately reported	Not captured
<ul style="list-style-type: none">• Charity reuse / op shops• Other not-for-profit reuse shops• Secondhand clothing shops (commercial)• Rent-a-racks• Reclaimed timber shops• Commercial reuse collectors/exporters	<ul style="list-style-type: none">• Online marketplaces	<ul style="list-style-type: none">• Pawnshops• Commercial secondhand furniture shops and salvage yards• Council reuse shops³

² Includes other not-for-profit reuse organisations that don't identify as traditional charities, with their focus on enterprise to help society.

³ Unless ran by charities which is captured

2. Methodology

We undertook the following methodology to deliver this project.

2.1. Survey with reuse organisations

We developed a project survey to capture information on reuse activity and impacts in NSW. The survey form was:

- designed to capture information on reuse activity and impact data across NSW (see Box 1)
- prepared in line with the Monash University National Reuse Measurement Guidelines
- piloted and refined with the Project Working Group
- promoted via Charitable Reuse Australia and NSW EPA's networks
- distributed to reuse organisations across NSW (based on a list of reuse organisations compiled by the project team with review by the Project Working Group)

The project team provided support to organisations with completing survey returns. We received 44 survey returns from a mix of reuse organisations (large and small), representing over 600 reuse shops in NSW.

Box 1: Information captured by survey

- Organisational information (e.g. name, organisation type, number of reuse sites/ shops, etc)
- The number of items reused by product category (Tier 1) and type (pre- vs post- consumer)
- Transaction data on the number secondhand items sold in NSW, donated to welfare recipients, and exported overseas
- A further breakdown of reuse by product category at Tier 3 level.
- Employment data – paid vs volunteer, open and targeted employment
- Workforce training and support provided to staff and volunteers
- Reuse-derived revenue spend on social/ environmental purposes
- Public education and outreach relating to reuse activities in NSW
- Repair activities undertaken on reuse items prior to sale
- Average weight of products sold for reuse
- Challenges and opportunities for reuse

A list of product categories (by Tier) from the National Reuse Measurement Guidelines is provided in Appendix 3.

2.2. Reviewing and validating survey responses

Survey data was reviewed, data gaps were filled where possible, and anomalies were identified and either validated or refined in consultation with data custodians. Data on reuse transactions were converted into mass (kilograms) based on unit weight data (see Appendix 1).

All data was anonymised and aggregated, and transformed into reuse activity and impact metrics, for example:

- The average number of transactions per site
- Paid employment (FTEs) per 10,000 tonnes of reuse
- Average sale price by item

The metrics were then presented to the Project Working Group for review, and some estimates were refined in line with reality checks.

2.3. Estimating items reused

Data was extrapolated to estimate reuse activity in NSW.

Reuse destination	Extrapolation basis
Secondhand items resold in NSW	Calculated the average weight of secondhand items sold per reuse shops/site (i.e. tonnes per shop per year). Multiplied this value by the total number of reuse shops/sites.
Secondhand items donated to NSW welfare recipients	Summed the total weight of (reported) items donated to welfare recipients. Calculated this value as a proportion (% weight) of secondhand items locally sold by NSW reuse organisations and used as the basis for extrapolation.
Secondhand items exported Overseas and Reused	<p>Extrapolated based on total volumes of 'Worn clothing and other worn textile articles' exported from NSW, as reported and defined by the ABS export data.</p> <p>Values were adjusted to remove materials that are 'downgraded' for reuse as rags, recycled, sent for energy recovery, or otherwise disposed. This was estimated from a combination of survey returns and literature.</p> <p>The survey was sent out to commercial reuse collectors/exporters within Charitable Reuse Australia's network. For exporters that provided survey returns, the average proportions of items by 'destination' were calculated as:</p> <ul style="list-style-type: none">- 76% of items reused- 13% of items downcycled to rags- 6% of items recycled

- balance recovered for energy, incinerated, or landfilled

The destinations of commercial reuse collectors/exporters outside of Charitable Reuse Australia's network were not identified through the survey. To fill this data gap, we took a conservative approach and adopted European Union (EU) literature values of 13% of items are reused, and 87% of items are incinerated or landfilled⁴. The EU reuse rate is likely to be significantly lower than Australia's, given:

- lower overall volumes in Australia (with European tonnes adding to waste destinations), and
- greater similarities in Australia's warmer climate with that of countries receiving secondhand items (which affects fashion and clothing materials and fabrics)⁵

To estimate items resold at the Tier 1 level:

- Survey data was analysed to estimate the proportion of items sold at different Tier 1 categories: 'clothing and textiles', 'toys, games household and homewares', 'other reuse items'.
- These percentages were then applied to the total number of items resold in NSW per year to provide the split by the Tier 1 categories.

This process was repeated for the breakdown of 'Clothing & Textiles' into reporting subcategories 'Clothing' and 'Textiles', and for 'Toys, Games, Household & Homewares' into 'Smaller items' and 'Furniture & Large Appliances', all using % number breakdowns, and then again using the Tier 3 categories % number of their respective reporting subcategory.

2.4. Estimating economic impacts

2.4.1. Economic impacts

Survey data on the total number of paid FTEs was summed and divided by total reuse tonnes handled by the reporting organisations. This provided metrics on paid FTEs per 10,000 tonnes. This data was extrapolated using total tonnes reused in NSW to estimate total paid employment in NSW. The same method was repeated to estimate total volunteer FTEs.

2.4.2. Value of secondhand items sold or donated

The value of secondhand items was estimated from survey data using reported revenue (total dollars) and estimated reuse volumes (tonnes) for reporting organisations. This was converted into average dollar per tonne values for secondhand products. Dollar per tonne values were estimated for clothing, textiles, furniture, and large appliances, 'smaller items' within the 'household, homewares, toys, and games' category, and 'other reuse items'. Separate values were applied for export volumes, which

⁴ EU Parliament, 2024, 'The Impact of Textile Production and Waste on the Environment', <https://www.europarl.europa.eu/topics/en/article/20201208STO93327/the-impact-of-textile-production-and-waste-on-the-environment-infographics>

⁵ Consultation with Charitable Reuse Australia

attract a lower value (see Appendix 2). The data was extrapolated for each category based on estimated total tonnes reused in NSW.

2.5. Estimating social impacts

2.5.1. Cost of living relief

Community savings from buying or receiving secondhand goods were estimated. Survey data was used to estimate the average sale price of secondhand goods (see Appendix 2). For secondhand goods sold, savings were calculated as the difference between the cost to buy new and the cost to buy secondhand. For welfare recipients, savings were calculated as the full value of buying new (since they received the secondhand items at no cost).

2.5.2. Reinvestment of surplus into social and community programs

Reuse shops provide an important source of revenue for social and community programs. Survey data was used to calculate proportion of resale revenue that is reinvested in programs (and by program category). This was then extrapolated to estimate total reinvestment.

2.5.3. Hours of training provided per year

Survey data was used to estimate hours of training per FTE per year. This included estimates by training category; formal work-readiness training, informal work-readiness training, life skills (e.g. personal presentation, communication, etc), case-management support and professional development. This data was then extrapolated by the total FTEs to estimate total hours of training per year.

2.5.4. Community engagement

Survey data was used on unique transactions across reuse shops/sites. A metric for 'items per transaction' was calculated, and total unique transactions were extrapolated from this data.

2.6. Estimating environmental impacts

We estimated the following environmental impacts:

- Diversion of waste from landfill
- Avoided consumption of virgin materials
- Carbon emission savings
- Water use savings
- Land use savings

Displacement rates were applied to the total tonnes of reuse to estimate avoided consumption of virgin materials (see key assumptions in Appendix 2). The method estimates avoided virgin materials in the displaced end products. Additional volumes of virgin materials are avoided upstream (e.g. offcuts from producing textiles) but were not quantified in this study. As such, these estimates are conservative.

Environmental conversion factors (ECFs) for carbon, land and water were applied to estimate environmental savings from displacing products through reuse. ECFs were adopted from a Lifecycles

study 'Environmental impact factors for products displaced from reuse, 2024', commissioned by Charitable Reuse Australia. See appendix 4.

2.7. Estimating repair

Repair activities performed by reuse organisations on secondhand items prior to sale were estimated. Survey data provided the proportion of items repaired (%), including for 'Clothing & Textiles' and 'Household, Homeware, Toys and Games'. Estimates were derived for % locally repaired items, and % for items repaired after export (for organisations that specified this). These percentages were extrapolated using the locally resold tonnes (for the locally repaired items), and the total exported tonnes (for the internationally repaired items).

3. Findings: Items reused

In 2022-23, an estimated 107.7 million secondhand items were rehomed through NSW charity shops, other not-for-profits, secondhand clothing stores, rent-a-racks, reclaimed timber shops, and commercial reuse collectors/exporters. Of these items, 36.8 million were resold locally. Additionally, 3.4 million were donated to welfare recipients. The remaining 67.5 million items were reused overseas (Table 2).

Table 2: Estimated number of items reused via NSW reuse organisations, 2022-23. Subtotals may not sum due to rounding.

	Items (#/yr)	Weight (t/yr)
Resold in NSW	36,830,000	28,700
Donated to NSW welfare recipients	3,410,000	1,100
Sold for overseas export and reuse	67,470,000	20,000
Total	107,710,000	49,900

These 107.7 million items included:

- 81.5 million items (or 21,100 t) of clothing
- 7.1 million items (or 5,100 t) of other textiles
- 370,000 items (or 6,000 t) of furniture and large appliances
- 15.8 million items (or 5,000 t) of smaller household and homeware items, toys, and games, and
- 2.9 million items (or 12,600 t) of other reuse items (such as wood and timber products)

Table 3 provides a further breakdown of items reused by product category.

Table 3: Further breakdown of data from Table 2 showing the estimated number of items reused and weight (tonnes) per product category, 2022-23. Subtotals may not sum due to rounding. Note that these categories are based on the National Reuse Measurement Guidelines, which are drawn from the ABS charter of national accounts.

Product category	Items reused (#/yr)	Weight reused (t/yr)
Clothing & Textiles	88,640,000	26,200
Clothing	81,510,000	21,100
Clothing (knitwear)	830,000	300
Clothing (other than knitwear)	7,580,000	1,900
Clothing (not specified)	70,150,000	17,500
Footwear	2,950,000	1,300
Textiles	7,130,000	5,100
Textiles: Raw textiles and fabrics	130,000	<100
Textiles: Products and carpet	4,330,000	4,300
Textiles: Handbags and suitcases	1,950,000	600
Textiles (not specified)	720,000	200
Toys, Games, Household & Homewares	16,170,000	11,000
Furniture & Large Appliances	370,000	6,000
Indoor Furniture	350,000	5,200
Whitegoods and large appliances	20,000	700
Smaller items	15,800,000	5,000
Cushions & Furnishings	500,000	200
Glassware	1,020,000	300
Ceramics and pottery	970,000	400
Metal homewares, cutlery & cookware	1,000,000	300
Toys, sports (including bikes), games, art supplies & bric a brac	3,010,000	800
Books, magazines, software and video games	3,160,000	800
Music and videos	1,850,000	300
Computers, peripherals and home electronics	400,000	100
Homewares/ Bric a brac / Electronics (not specified)	3,890,000	2,000
Other Reuse Items	2,890,000	12,600
Wood and timber products	80,000	1,000
Plastic products	270,000	100
Rubber products	<1,000	<100
Ferrous metal	430,000	400
Non-ferrous metal	30,000	<100
Metal tools and hardware	70,000	100
Outdoor tools and machinery	10,000	100
Other (not specified)	2,000,000	11,000
Total	107,710,000	49,900

4. Findings: Economic impact

4.1. Employment

Reuse organisations generated paid employment for an estimated 1,535 full time equivalents (FTEs) in 2022-23. This includes 348 FTEs facing barriers to employment. This includes Long-term unemployed (40), Migrant/ refugee background (63), Disability (23), Centrelink Mutual obligation (70), and Other (not specified) (152).

Further, an estimated 3,306 FTEs volunteer their time across reuse organisations. These volunteer FTEs are completed by over 31,000 people across NSW. This does not specifically include any data from volunteer campaign events.

Reuse generates more jobs on a per tonne basis than recycling and landfill:

- The estimated direct FTE employment per 10,000 tonnes of waste is 9.2 for recycling and 2.8 for landfill disposal⁶
- This compares to 228 paid FTEs per 10,000 tonnes of material handled for reuse (Table 4).

In other words:

Reuse generates 25 times more jobs than recycling and 81 times more jobs than landfill (on a per tonne basis)

Table 4: Estimated employment by reuse organisations in NSW, 2022-23.

	Paid (FTEs)	Volunteer (FTEs)	Total (FTEs)
Open employment	1,187	2,575	3,762
Barriers to employment	348	731	1,079
Total	1,535	3,306	4,841
FTEs per 10,000 tonnes handled*	228	491	719

* denominator used accounts for the fact that material is handled twice in some instances across multiple organisations. E.g. material donated to a charity may be sent to a commercial reuse collector/exporter. Total tonnes handled for reuse = 67,300 t/yr, whereas total tonnes reused = 49,900 t/yr.

⁶ Access Economics (2009), Employment in waste management and recycling.

4.2. Value of secondhand items sold or donated

Secondhand items sold or donated were valued at an estimated at \$243 million dollars in 2022-23. This includes:

- \$213 million of items resold in NSW (e.g. through vintage and op shops)
- \$14 million of items donated to NSW welfare recipients, and
- \$16 million of items exported overseas and reused (Table 5).

Table 5: Estimated value of secondhand items sold or donated by NSW reuse organisations, 2022-23. Subtotals may not sum due to rounding.

	Value (\$)
Resold in NSW	\$ 213,000,000
Donated to NSW welfare recipients	\$ 14,000,000
Sold for overseas export and reuse	\$ 16,000,000
Total	\$ 243,000,000

5. Findings: Social impact

5.1. Cost-of-living relief

Australia is facing a cost-of-living crisis. Reuse organisations provided an estimated \$432 million in community savings in 2022-23. This represents the savings to the community from buying or receiving secondhand goods compared to buying new.

Reuse organisations help to relieve cost of living pressures, saving NSW residents an estimated \$432 million per year.

5.2. Reinvestment of surplus into social and community programs

Charitable reuse shops provide an important source of revenue to help fund social and community programs. In NSW, an estimated \$51 million was reinvested by charitable reuse organisations into social and community programs in 2022-23. This includes support for:

- People experiencing homelessness
- People with a disability
- Youth, elderly people, and families
- Targeted employment and workforce development
- Promoting reuse and circular economy principles.

Reuse organisations reinvested an estimated \$51 million in social and community programs and initiatives.

5.3. Hours of training provided per year

Reuse organisations provided an estimated 158,000 hours of training to their paid staff and volunteers in NSW in 2022-23. This included work-readiness training, life skills, case management support and professional development (Table 6).

Table 6: Training provided to paid staff and volunteers across NSW reuse organisations (estimated hrs/year), 2022-23. Subtotals may not sum due to rounding.

	Total Training Provided (hrs/yr)
Formal work-readiness training	38,000
Informal work-readiness training	109,000
Life skills (e.g. personal presentation, communication, etc)	4,000
Case-management support	3,000
Professional development (including training)	5,000
Total	158,000

5.4. Community engagement

Reuse shops offer the public a chance to participate in reuse activities. We estimate that the public undertook 16 million transactions across NSW in 2022-23.

6. Findings: Environmental savings

6.1. Landfill diverted

Reuse organisations diverted an estimated 49,900 tonnes of products from landfill to reuse in 2022-23.

6.2. Avoided consumption of virgin materials

Buying secondhand reduces the need for consumers to buy new products. This, in turn, avoids consumption of virgin materials that would otherwise have been used to make the new products. The direct consumption of 22,000 tonnes of virgin materials was avoided through reuse activity by NSW reuse organisations. This estimate considers rates at which consumers displace new items for new, assumed at 35% for Clothing and Footwear, 54% for indoor furniture, and 50% for all other items⁷. The estimate includes virgin materials in the displaced end products and does not account for additional virgin materials avoided upstream (e.g. excludes offcuts from production).

6.3. Carbon, water, and land savings

Extracting virgin materials and manufacturing them into them into new products generates greenhouse emissions, uses land, and consumes water. Using secondhand products avoids environmental impacts of making new products. Reuse activity saved an estimated⁸:

- 343,000 tonnes of carbon dioxide equivalent (tonnes of CO₂-e), equivalent to taking 141,000 passenger vehicles off the road,
- 16,000 megalitres (ML) of water, equivalent to the water volume of 7,000 Olympic-sized swimming pools, and
- 192,000 hectares (ha) of land, equivalent to the size of 269,000 soccer pitches.
 - This area of land would cover over 80% of the Australian Capital Territory.

These estimates are based on the Environmental Conversion Factors study completed by Lifecycles in September, which assessed the environmental impacts of products displaced through reuse. The study was commissioned by Charitable Reuse Australia, following Rawtec's recommendation, and further refines methods for estimating environmental benefits. As a result, the data presented here serves as an update to the June 2024 Executive report.

⁷ Displacement rates have been updated from the June 2024 estimates, incorporating the latest research from BehaviourWorks.

⁸ These estimates represent the environmental savings of avoiding making new products (through displacing them with secondhand items). Additional environmental savings are achieved by diverting items from landfill (and hence preventing materials breaking down anaerobically), however these were not quantified since the savings are minimal compared to the upstream environmental savings from preventing new products being made. In addition, the estimates do not account for environmental impacts of running reuse operations (e.g. collection of secondhand items, running reuse shops, etc), however, again, these impacts are negligible compared to the environmental savings from avoiding making new products.

Table 7: Estimated environmental savings of reuse activity through NSW reuse organisations, 2022-23. Subtotals may not sum due to rounding.

Landfill diversion to reuse (tonnes)	49,900
Avoided consumption of virgin materials (tonnes)	22,000
Carbon emission savings (tonnes CO ₂ -e)	343,000
> equivalent number of passenger vehicles taken off the road	141,000
Water savings (ML)	16,000
> equivalent number of Olympic size swimming pools	7,000
Land savings (ha)	192,000
> equivalent number of soccer pitches	269,000

7. Findings: Repair

Reuse organisations repair up to 8% of all reused items. Most repair occurs offshore. Of items that are exported from Australia, up to an estimated 3,700 tonnes are repaired internationally. Locally, up to an estimated 200 tonnes of items are repaired.

Table 8: Number of items repaired locally and internationally prior to reuse. Subtotals may not sum due to rounding.

	Locally Repaired (t/yr)	Internationally Repaired (t/yr)	Total (t/yr)
Clothing & Textiles	<100	3,700	3,800
Toys, Games, Household & Homewares	100	⁹	100
Other Reuse Items	-	-	-
Total	200	3,700	3,900
% of Total Reused			8%

⁹ A small volume of data was reported, but was insufficient to extrapolate.

8. Data gaps/limitations and future research opportunities

This study is the most detailed of its kind in Australia to estimate reuse activity and triple-bottom-line impacts at the State level. However, as with any research endeavour, there were some data gaps and opportunities for enhancement. These areas for improvement and expansion in future reporting periods are summarised below.

8.1. Online marketplaces

Large volumes of secondhand items are exchanged via online marketplaces, such as eBay, Gumtree, and Facebook Marketplace operating primarily in the consumer-to-consumer space (C2C). We sought to collect data from these online marketplaces via the survey, however, these organisations did not provide data for this project.

To fill this data gap, we performed a high-level analysis of publicly available data on the value and type of items exchanged. We estimate that a further 16 million items are rehomed in NSW through online marketplaces. These findings are presented separately from other data in this report due to the limited confidence in the accuracy of estimates for online marketplaces.

Recommendation 1: Charitable Reuse Australia and the NSW EPA should continue to engage with online marketplaces with the aim of securing data for future surveys.

8.2. Expanding survey

This study encompassed a diverse array of reuse organisations in NSW, including charity shops, other not-for-profits, secondhand clothing stores, rent-a-racks, reclaimed timber shops, and commercial reuse collectors/exporters. However, certain reuse activities were not included in this study, including reuse activity across pawnshops, salvage yards, commercial secondhand furniture shops, and council reuse shops (unless operated by a not-for-profit). There is an opportunity to expand on this work, by capturing these organisations in future.

Recommendation 2: Expand project survey in future years to capture additional volumes of reuse activity from pawnshops, salvage yards, commercial secondhand furniture shops, and council reuse shops.

8.3. Secondhand product weights for 'other reuse items'

Data was collected from reuse organisations on the average weight of secondhand items by product category (see Appendix 1). For example, the average weight of a piece of clothing is 250 grams. However, item weights can vary significantly within a category; for instance, the weight of baby clothing differs from that of an adult winter jacket. The data on the weight of clothing represents the average across thousands of donated clothing items, encompassing a variety of clothing types.

Data on Tier 3 product categories within 'clothing and textiles' and 'household, homewares, toys, and games' were gathered from organisations with a substantial number of sites. Conversely, data points for the weights of 'other reuse items' were more limited. We recommend more data is collected on these items weights in future studies to refine these estimates.

Recommendation 3: Conduct research to gather more data points for product weights of 'other reuse items'. This could be addressed by expanding future surveys to include salvage yards (see Recommendation 2).

8.4. Displacement rates

Further research is needed to validate the 'offset effect' of reduced new-item consumption resulting from reused item purchases. We adopted displacement rates based on research by, and consultation with, BehaviourWorks Australia. This included displacement rates for clothing and footwear (35%), furniture (54%). There were several items where we had gaps and assumed a displacement rate of 50% (see Appendix 2).

Recommendation 4: Commission research to develop a comprehensive suite of displacement rates aligning with Tier 3 product categories in the National Guidelines for Measuring Reuse.

8.5. Improving the capacity of reuse organisations to report on repair and public outreach activities

We sought data from reuse organisations on their public education and outreach activities. Several survey respondents reported data on the number of unique transactions across their reuse sites/shops in NSW (an indicator of the number of customers engaging in reuse). However, very few organisations were able to provide data on their public education efforts. As a result, there was insufficient data to estimate public education efforts by reuse organisations across NSW.

This study also sought to estimate repair activities performed by reuse organisations on secondhand items prior to sale. Data was collected on both local repair activities (e.g., repairs conducted by volunteers at op shops) and international repair efforts (e.g., garments sent overseas for repair prior to reuse). Many survey respondents indicated that the data provided was a high-level estimate and did not have systems to measure these repair activities regularly and accurately.

Recommendation 5: Undertake study with a sample of reuse organisations to improve their methods and processes for tracking repair, public education, and outreach activities.

8.6. Updating National Guidelines for Measuring Reuse

This project was the first time that the Monash University National Guidelines for Measuring Reuse was adopted. These guidelines provided a practical methodology to estimate reuse activity and impacts. There were some learnings through the project, which could be applied to update and further improve the Guidelines. This includes:

- Splitting the Tier 3 category 'indoor furniture, cushions, and furnishings' into two separate Tier 3 categories; 'Indoor furniture' and 'Cushions and furnishings' given each has vastly different average weights and sale values.
- Adding the Tier 3 categories 'Clothing (not specified)', and 'Homewares/Bric a Brac/ Electronics (not specified)'.
- Changing the Tier 2 categories under 'Clothing & Textiles':
 - From current Tier 2 categories: 'Clothing', 'Footwear', and 'Textiles'.
 - Moving to new classifications for Tier 2: 'Clothing' (includes Tier 3 categories 'Footwear' and 'Clothing (not specified)'), and 'Textiles', to better suit the reporting by reuse organisations.
- Changing the Tier 2 categories under 'Toys, Games, Household & Homewares':
 - From current Tier 2 categories: 'Indoor furniture' and 'Homewares/ Bric a Brac/ Electronics'
 - Moving to new classifications for Tier 2: 'Furniture and Large Appliances' and 'Smaller Items' – given these groupings are better suited to reporting by reuse organisations.

We made these adjustments to reporting categories in this Project.

In addition, we recommend that the Guidelines are updated to include:

- the list of ECFs for products displaced by reuse, which were recently developed by Lifecycles for Charitable Reuse Australia. This study was commissioned on recommendation by Rawtec to draw ECFs from a consistent source, fill data gaps, and align conversion factors with Tier 3 categories.
- an expanded set of displacement rates (see recommendation 4) should data become available.

Recommendation 6: Update the National Measuring Reuse Guidelines to further improve their useability based on lessons from this Project, recently developed ECFs and incorporate any updated research for displacement rates.

Appendix 1 – Average weights of secondhand products/items

Table 9 below provides a list of average weights of secondhand products/items. This data was collected in the survey from reuse organisations. See section 8.3 and recommendation 3 of main report.

Table 9: Average weights of secondhand products/items (g/item)

	Average item weight (g/item)	Number of sites data represents
Clothing & Textiles		
Clothing		
Clothing (knitwear)	400	311
Clothing (other than knitwear)	250	311
Clothing (not specified)	250	309
Footwear	450	305
Textiles		
Textiles: Raw textiles and fabrics	300	222
Textiles: Products and carpet	1,000	223
Textiles: Handbags and suitcases	300	304
Textiles (not specified)	250	81
Toys, Games, Household & Homewares		
Furniture & Large Appliances		
Indoor Furniture	15,000	304
Whitegoods and large appliances	32,500	303
Smaller items		
Cushions & Furnishings	375	304
Glassware	300	304
Ceramics and pottery	400	304
Metal homewares, cutlery & cookware	300	304
Toys, sports (including bikes), games, art supplies & bric a brac	250	304
Books, magazines, software and video games	250	304
Music and videos	150	304
Computers, peripherals and home electronics	200	82
Homewares/ Bric a brac / Electronics (not specified)	500	81
Other Reuse Items		
Wood and timber products	12,500	2
Plastic products	200	1
Rubber products	400	1
Ferrous metal	1,000	1
Non-ferrous metal	800	1
Metal tools and hardware	1,500	1
Outdoor tools and machinery	5,000	1
Other (not specified)	5,500	1

Appendix 2 – Key assumptions

Table 10: List of key assumptions and external data used during the analysis

Item	Value	Units	Notes
Number of reuse shops/sites in NSW			
Number of Non-profit reuse shops/sites	645	sites	Based on data provided by Charitable Reuse Australia
Number of Commercial rent-a-racks	23	sites	Based on online search of rent-a-racks located in NSW
Number of Commercial vintage clothing shops	48	sites	Based on total reuse shops listed on OpShop.org, removing the number of non-profit reuse shops/sites
Number of reclaimed timber shops	11	sites	Based on online search of specialist reclaimed timber shops located in NSW, does not include general salvage yards.
Displacement rates			
Displacement rate for clothing and footwear	35%	%	In line with National Reuse Guidelines
"" for furniture	54%	%	In line with National Reuse Guidelines
"" for all other product categories (not captured above)	50%	%	Assumption
Conversion factors			
Australian average vehicle emissions per year (adopted)	2.43	t CO ₂ -e/yr	Based on average km per year and average GHG emissions per km
Minimum volume of an Olympic Swimming Pool	2.50	ML	Based on FINA Technical Guidelines for Olympic Swimming Pool sizes
Recommended size of a soccer pitch	0.71	ha	Based on FIFA Technical Guidelines for pitch dimensions
Average price of new items			
Clothing & textiles			
Clothing	\$ 16.42	\$/item	Estimated from survey data
Textiles	\$ 16.82	\$/item	Estimated from survey data
Toys, Games, Household & Homewares			
Smaller items	\$ 7.42	\$/item	Estimated from survey and additional data
Furniture & Large Appliances	\$ 406.44	\$/item	Estimated from additional data from online furniture and white good catalogues
Other Reuse Items	\$ 7.61	\$/item	Estimated from survey data
Average price of secondhand items sold in NSW			
Clothing & textiles			
Clothing	\$ 7.22	\$/item	Estimated from survey data
Textiles	\$ 7.40	\$/item	Estimated from survey data
Toys, Games, Household & Homewares			
Smaller items	\$ 2.83	\$/item	Estimated from survey data
Furniture & Large Appliances	\$ 53.71	\$/item	Estimated from survey data and additional consultations
Other Reuse Items	\$ 3.01	\$/item	Estimated from survey data
Clothing & textiles			
Clothing	\$ 27,200	\$/tonne	Estimated from survey data
Textiles	\$ 15,600	\$/tonne	Estimated from survey data
Toys, Games, Household & Homewares			
Smaller items	\$ 8,700	\$/tonne	Calculated using Tier 1 \$/tonne and 'Furniture & large appliances' \$/tonne and number of tonnes of 'Smaller items'
Furniture & Large Appliances	\$ 3,300	\$/tonne	Estimated from survey data and additional consultations
Other Reuse Items	\$ 700	\$/tonne	Estimated from survey data
Export data			
Tonnes of clothing and textiles exported from NSW	35,229	tonnes	2022-23 ABS Export Data
Average price for clothing exported from Australia	\$ 0.81	\$/kg	AFC: Clothing Data Report, 2022
Export Destinations (rounded)			
For reporting export organisations			
Reused	76%	%	Survey data
Downcycled to Rags	13%	%	Survey data
Recycled	6%	%	Survey data
Energy From Waste & Landfill	6%	%	Survey data
Assumed reuse rate for non-reporting export organisations	13%	%	Conservative estimate based on european waste data

Appendix 3 – Product Categories from National Reuse Measurement Guidelines

The product categories from the National Reuse Measurement Guidelines are derived from the Input-Output tables of the Australian National Accounts, published by the ABS.

Table 11: Items sold for reuse and corresponding tiers according to Monash University's National Reuse Measurement Guidelines

Items sold for reuse

Tier 1	Tier 2	Tier 3	IOPG
Clothing and Textiles	Clothing	Clothing (knitwear)	1304
		Clothing (general)	1305
	Footwear	Footwear	1306
	Textiles	Raw textiles and fabrics	1301
		Textile products and carpet	1303
		Handbags and suitcases	1302
Toys, Games, Household & Homewares	Furniture	Indoor furniture, cushions and furnishings	2501
	Homewares/ Bric a brac	Glassware	2001
		Ceramics and pottery	2002
	Electronics	Metal homewares, cutlery & cookware	2204b
		Toys, sports, games, art supplies and bric a brac	2502
	Books, magazines, software and video games	5401	
	Music and videos	5501	
	Computers, peripherals and home electronics	2401	
	Whitegoods and large appliances	2404	
Other	Building materials	Wood and timber products	1402
		Plastic products	1901
		Rubber products	1902
		Ferrous metal	2101
		Non-ferrous metal	2102
	Hardware	Metal tools and hardware	2204a
		Outdoor tools and machinery inc. powered outdoor tools and lawnmowers	2405

Appendix 4 – Environmental Conversion Factors

Charitable Reuse Australia engaged Lifecycles to develop a list of Environmental Conversion Factors (ECFs) for products displaced from reuse. These ECFs align with Tier 3 categories of the National Guidelines for Measuring Reuse and were derived from a consistent source of data (Exiobase).

Table 12: Environmental conversion factors for products displaced from reuse (Source: Bontinck, P.A., Grant, T.F. (2024), Environmental impact factors for products displaced from reuse, Lifecycles, Melbourne, Australia).

	GHG Emissions (kg CO ₂ e/kg)	Water Use (L/kg)	Land Use (m ² /kg)
Clothing & Textiles			
Clothing			
Clothing (knitwear)	38	1,039	263
Clothing (other than knitwear)	29	1,590	44
Clothing (not specified)	30	1,515	74
Footwear	12	540	57
Textiles			
Textiles: Raw textiles and fabrics	16	1,456	66
Textiles: Products and carpet	20	1,442	82
Textiles: Handbags and suitcases	17	700	106
Textiles (not specified)	19	1,352	85
Toys, Games, Household & Homewares			
Furniture & Large Appliances			
Indoor Furniture	6	167	102
Whitegoods and large appliances	10	295	9
Smaller items			
Cushions & Furnishings	34	1,316	141
Glassware	1	13	0
Ceramics and pottery	1	48	1
Metal homewares, cutlery & cookware	8	178	8
Toys, sports (including bikes), games, art supplies & bric a brac	5	175	64
Books, magazines, software and video games	29	1,086	254
Music and videos	8	287	32
Computers, peripherals and home electronics	143	3,596	127
Homewares/ Bric a brac / Electronics (not specified)	10	315	93
Other Reuse Items			
Wood and timber products	1	44	176
Plastic products	6	198	8
Rubber products	4	152	11
Ferrous metal	4	69	1
Non-ferrous metal	9	141	7
Metal tools and hardware	8	178	8
Outdoor tools and machinery	10	295	9
Other (not specified)	3	85	100

