Scaling Up Reusable Packaging

APCO

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Ready for Reusable Packaging

Reusable packaging presents a significant opportunity for sustainability and also for our economy. As reusable packaging continues to be sought after by consumers and industry, it is important to determine what is reusable packaging and how businesses and users can benefit from reusable packaging models.

This resource aims to provide an understanding of what reusable packaging is, its potential benefits, and key learnings to consider from other reusable packaging models that are active in the packaging supply chain today. It also contains a framework to inspire and structure thinking when adopting one of the eight reusable packaging models. In the development of this document, APCO engaged with a variety of stakeholders across a range of sectors in both the Business to Consumer (B2C) and Business to Business (B2B) markets, who provided valuable insights into the opportunities, benefits and considerations identified in this document.

Following *avoidance* or *reduction* of packaging materials, the waste hierarchy places reuse as the next best pathway to achieve the highest potential environmental value[1] for packaging (Figure 1). As evidenced from a range of national and international case studies, reusable packaging models can help deliver cost savings, logistic efficiencies, improve brand image and reputation, facilitate greater user insights, as well minimising CO_2 emissions, energy consumption and waste production.
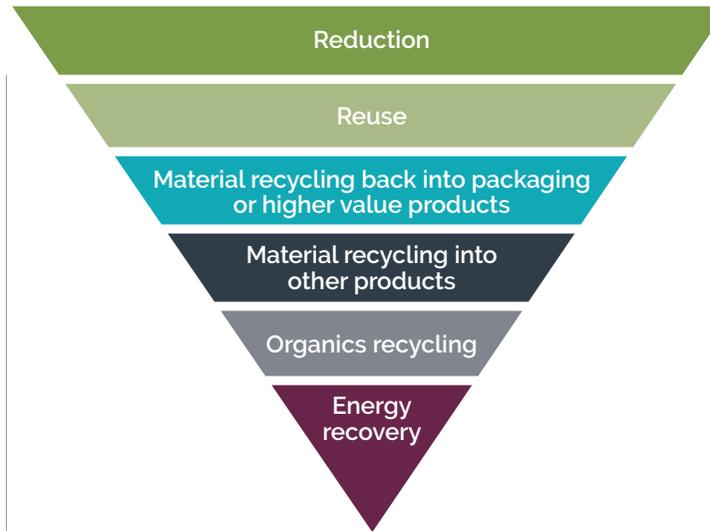

Figure 1 - Context of Reuse in Waste Hierarchy

- Reduction
- Reuse
- Material recycling back into packaging or higher value products
- Material recycling into other products
- Organics recycling
- Energy recovery

Rising global pressures to reduce waste, changes in government policies, the 2025 National Packaging Targets and consumer demand for more sustainable and innovative packaging, are all major drivers in encouraging businesses and consumers to participate in systems of reuse. Current trends indicate growth in several industries in the B2C market, such as home and personal care, retail, beverages and takeaway.

To implement systems of reuse, organisations will need to consider appropriate models and strategies. As these models are implemented and supply chains adapt, more reusable packaging solutions will be introduced and incorporated into the Australian market.

As Australia strives for 100% of packaging to be reusable, recyclable or compostable by 2025[2] (Figure 2) and a specific milestone of 10% of packaging to be reusable by 2025,[3] there is both opportunity and urgency to expand the adoption of reusable packaging in B2C and B2B markets and to realise its broad-reaching social, economic and environmental benefits.
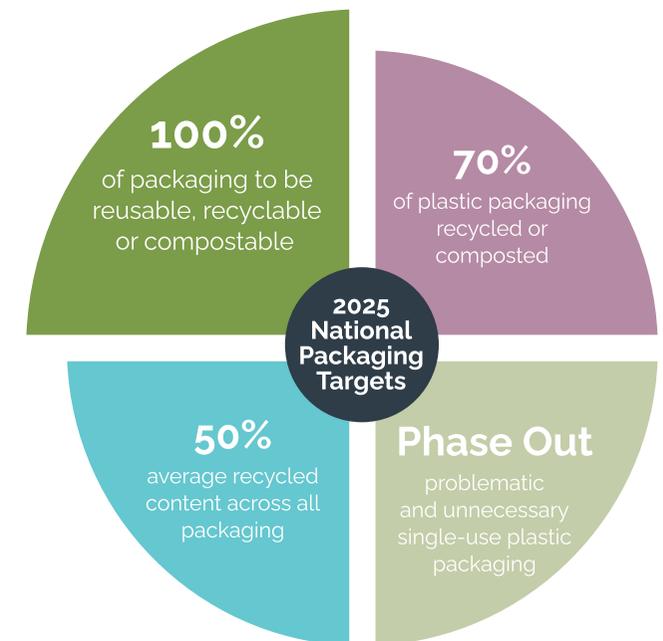

- **100%** of packaging to be reusable, recyclable or compostable
- **70%** of plastic packaging recycled or composted
- **50%** average recycled content across all packaging
- **Phase Out** problematic and unnecessary single-use plastic packaging
- 2025 National Packaging Targets

Figure 2 - The 2025 National Packaging Targets

Defining Reusable Packaging

Reusable Packaging is defined as packaging which proves its capability of accomplishing a minimum number of trips (or reuse cycles) within its lifecycle, in a purposefully designed system of reuse. Importantly, reusable packaging must be used again in the same application for which it was originally designed.

Repurpose vs. Reuse

Repurposing is often confused with reuse – for example, a rubber band used to hold vegetables or a glass jar, can both be kept by a consumer and repurposed to hold other items; however, they are not in a purposefully designed system of reuse for the same application. This does not diminish the benefits of repurposing; it is just important to identify the difference.

Repurpose

Reuse

A **System of Reuse** is defined as the established organisational, technical or financial arrangements which ensure the possibility of reuse.

The **minimum number of trips** (or reuse cycles) refers to the fact that the system of reuse in place should be proven to work in practice.[4]

In the B2B market, reusable packaging is also referred to as "reusable secondary", "transport" or "transit" packaging. In the B2C market, reusable packaging may also be referred to as "reusable primary" packaging.[5]

The above definition is informed by international best practice, including the Ellen MacArthur foundation's definition, as modified from the International Standard Organisation's definition. This definition has been endorsed by the United Nations Environment Programme and over 450 organisations as part of the New Plastics Economy Global Commitment.[6]

Reusable packaging models

Eight models can be used to classify reusable packaging, broken down into Business to Consumer (B2C)[7] and Business to Business (B2B)[8]. These differ in terms of packaging 'ownership' and the actions required for the packaging to achieve its reuse cycles (Figure 3).

Some systems may fall under multiple models, for example, the **Loop** case study offers both return from home and return on the go options. Refer to the case studies for more detailed examples of each model in practice.
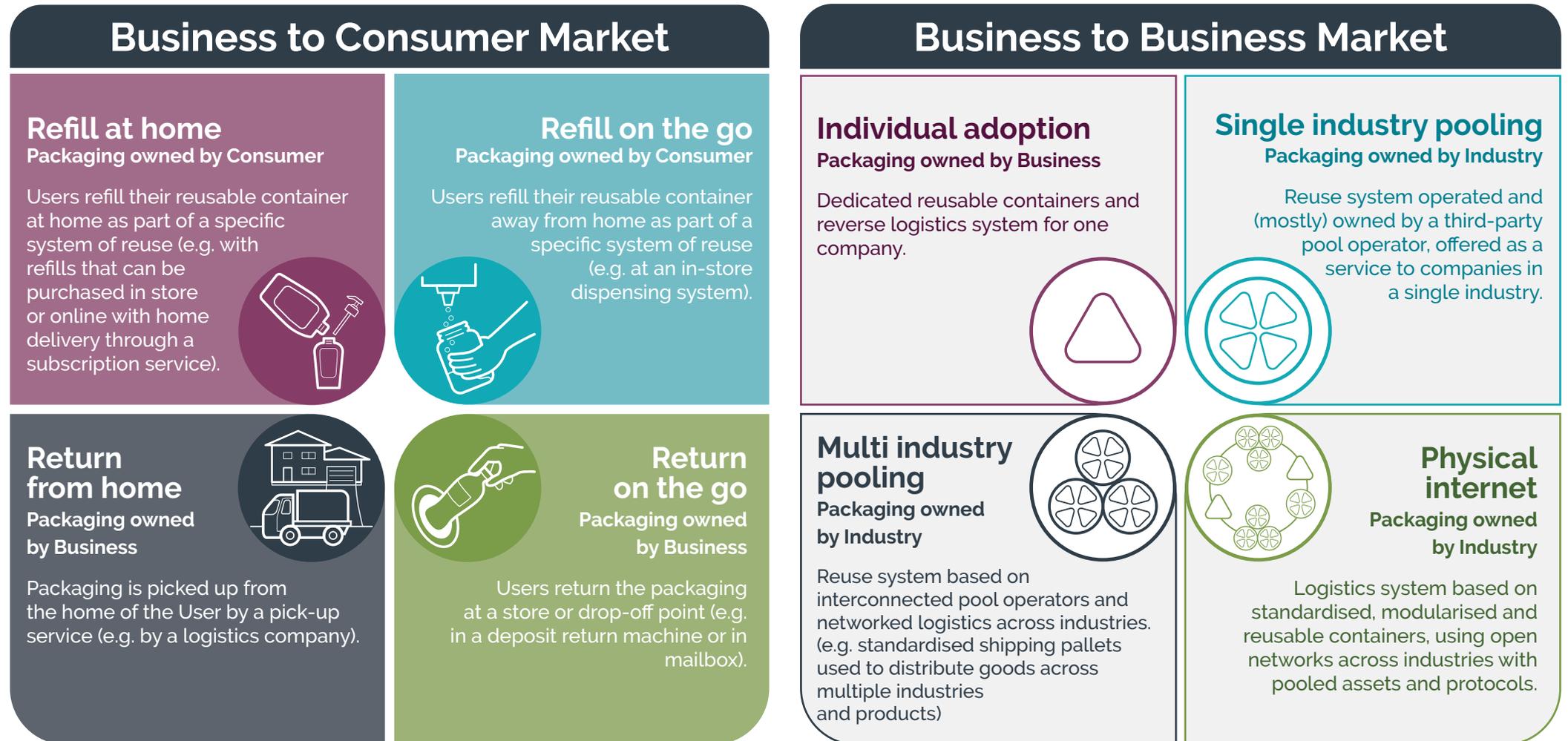
Business to Consumer Market

Refill at home
Packaging owned by Consumer

Users refill their reusable container at home as part of a specific system of reuse (e.g. with refills that can be purchased in store or online with home delivery through a subscription service).

Refill on the go
Packaging owned by Consumer

Users refill their reusable container away from home as part of a specific system of reuse (e.g. at an in-store dispensing system).

Return from home
Packaging owned by Business

Packaging is picked up from the home of the User by a pick-up service (e.g. by a logistics company).

Return on the go
Packaging owned by Business

Users return the packaging at a store or drop-off point (e.g. in a deposit return machine or in mailbox).

Business to Business Market

Individual adoption
Packaging owned by Business

Dedicated reusable containers and reverse logistics system for one company.

Single industry pooling
Packaging owned by Industry

Reuse system operated and (mostly) owned by a third-party pool operator, offered as a service to companies in a single industry.

Multi industry pooling
Packaging owned by Industry

Reuse system based on interconnected pool operators and networked logistics across industries. (e.g. standardised shipping pallets used to distribute goods across multiple industries and products)

Physical internet
Packaging owned by Industry

Logistics system based on standardised, modularised and reusable containers, using open networks across industries with pooled assets and protocols.

Figure 3 - Reusable Packaging Models

Reusable Packaging is More Relevant than Ever

Opportunities and drivers

Globally, the sustainable packaging market is predicted to grow to a value of **$297 billion USD by 2024.**[9] **If 20 per cent of global single-use plastic packaging is replaced with reusable alternatives, it could present a substantial innovation opportunity worth at least USD $10 billion, with significant benefits to users and businesses.**[10]

The main drivers underpinning the shift towards reusable packaging include:

- **Rising global sustainability pressures** from consumers, businesses and government to reduce waste, eliminate pollution and reduce carbon emissions from packaging materials.[11] Media such as 'Blue Planet' and 'The War on Waste' have educated consumers and businesses on the impacts of waste. This has increased the demand for plastic-free packaging options and major retailers have already responded by making changes in support of a circular economy ahead of government policies (for example, major Australian supermarkets banned single-use plastic bags nationally in 2018).[12] By adopting reuse models, businesses can be identified as industry leaders, grow brand loyalty and help meet increasing expectations from consumers.

- **National Waste import and export bans** are coming into effect. By the end of 2024 Australia will no longer able to export more than 1.4 million tonnes of waste plastic, paper, glass and tyres previously shipped overseas for reprocessing. Waste plastics are on a shorter trajectory, with export bans to be finalised by July 2022. These bans have highlighted a need to seek urgent solutions to effectively manage recyclable waste on-shore.[12, 14, 15]

- **Government circular economy policies and strategies** are currently being developed and implemented by Australian jurisdictions, such as the *New South Wales Circular Economy Policy*,[16] and Victoria's *Recycling Victoria, A new economy*.[17] In addition, Western Australia's *Waste Avoidance and Resource Recovery Strategy Action Plan*[18] and Queensland's *Waste Management and Resource Recovery Strategy*[19] position the circular economy as a strategic priority, with Western Australia fast-tracking a number of measures, ahead of original timelines.[20] On a municipal level, local government areas such as Lake Macquarie[21] are forging a path for more localised circular economy initiatives and approaches. Implementing reuse models can act as a significant lever towards achieving a circular economy in Australia.

- **Capitalising economic value** predicted in research and modelling, which show that by 2025 the value of a circular economy in Australia is estimated at $26 billion per year. This could support the development of new industries and jobs, reduce greenhouse gas emissions and increase efficient use of natural resources.[22] By 2047-48, the benefit of a circular economy will likely rise to a present value of $210 billion in GDP and an additional 17,000 full-time equivalent (FTE) jobs for Australia.[23]

- **Demand for more sophisticated packaging functionalities**, driven by consumers - including customisation, high-quality and positive environmental impacts.[24]

$US 1 = $AU 1.39 at time of publication

Reusable packaging targets

Setting targets for reusable packaging enables organisations and industry to have a collective goal to work towards and to monitor the impact of these programs. Business making public commitments towards reuse signals to the market the forthcoming demand and offers certainty to invest in building capacity. Locally, reuse is embedded in Australia's National 2025 Packaging Targets (Figure 1) which strive towards 100 per cent of packaging designed to be reusable, recyclable or compostable by 2025.[25]

Internationally, there are several examples of reusable packaging targets. The Ellen McArthur Foundation has proposed 20 per cent of plastic packaging could be reusable,[26] and in December 2019, France legislated to ban all single-use plastics by 2040. From this, France have set reusable packaging targets of five per cent by 2023 and 10 per cent by 2027.[27] The European Council has also noted that it would consider setting targets in the future and supports collection of data to better understand current levels of reusable packaging across member states.[28]

Global evidence suggests that reusable packaging targets can be achieved:

- 35 per cent of all transport packaging globally is already reusable, driven mainly by the cost-savings and handling efficiencies offered by reusable transport packaging systems.[29]

- In 2020, the global packaging market reached an estimated US$950 billion in value. Approximately US$200 billion of this is considered "transport" or "transit" packaging, of which roughly half meets the Reusable Packaging Association's criteria for "reusable" packaging. Together, these products comprise the US$100 billion reusable transport packaging market.[30]

- In Europe, reusable packaging for distributing fruit and vegetable products accounts for 40 per cent of packaging in the sector.[31]

- In Japan, it is estimated that 80 to 98 per cent of the market for home and personal care brand **Kao** is comprised of reusable packaging such as refill pouches for detergent bottles.[32]

Phasing out single-use packaging

Rethinking how businesses bring their products to people, without relying on disposable packaging, is a critical part of the circular economy. Following avoidance or reduction of packaging materials, the waste hierarchy places reuse as the next best pathway to explore when phasing out problematic and unnecessary single-use packaging to achieve the highest potential environmental value.

In 2018, the global packaging industry was worth USD $886.1 billion, with the Asia-Pacific region accounting for 44 per cent of that total (USD $389.88 billion). This reflects the region's large population, substantial domestic markets and manufacturing capabilities providing widespread international supply.[33]

In Australia, almost 6 million tonnes of packaging were consumed in 2018-19, of which only half was recycled after use.[34] While Australia is working to improve these recycling rates, challenges remain. Challenges to recycling stem from incorrect disposal, technical issues with certain types of packaging, contamination of waste streams and gaps in the recycling industry.

71 per cent of Australia's plastic waste is derived from packaging.[35] While plastic has multiple uses and provides light, innovative, strong and relatively inexpensive packaging materials, plastic packaging is often designed for short-term or single use despite being very slow to degrade. If not recycled, plastic becomes waste and causes pollution. In Australia, up to 130,000 tonnes of plastic will find its way into our waterways and into the ocean.[36] In response, the majority of state and territory governments have introduced legislation or are investigating ways to support the shift away from **problematic and unnecessary single-use plastics**,[37] with South Australia becoming the first state to legislate a ban on certain single use plastic items in March 2021.[38]

As more jurisdictions introduce legislated bans on single-use plastic items,[39, 40] opportunities to expand and implement reuse systems are becoming increasingly relevant and necessary.

Realise the Benefits of Reuse

Reusable packaging is an innovation opportunity. With the goal of transitioning to a circular economy, the packaging industry is changing the way it thinks, interacts and manages product packaging; moving from something that is inexpensive and short-term, to a high value asset that can deliver significant benefits to users, businesses and the environment. A well-designed reusable packaging system offers a range of potential benefits to all stakeholders in the supply chain, including:

Benefits to consumers

- Customisation of product quantities and personalised packaging.[41]

- Improved user experience with aesthetically-pleasing, functional and quality packaging, which can also prevent product damage and prolong perishable products' shelf-life.[42]

- Sense of belonging to a community through brand loyalty and incentive schemes, the use of return mechanisms and subscription services which enable insights into individual purchasing patterns.[43]

- Cost savings through more economical purchasing, such as bulk buying, refills or use of concentrates.[44]

Benefits to businesses

- Logistic efficiencies with reduced handling of the product along the supply chain, results in reduced use of transport vehicles, labour, and other transport-related resources.[45]

- Cost reductions and savings as a result of replacing single-use packaging materials, increasing the packaging lifespan and reduced waste management.[46]

- Simplified and more transparent and traceable supply chains, helping to better manage other aspects of sustainability (for example, human rights).[47]

- Improved ergonomics and worker safety achieved by reducing safety hazards (such as box cutting, staples and exposed nails), reducing manual handling injuries, introducing more functional containers and automated equipment through more standardised packaging.[48]

- Increased consumer insights and data through using smart systems (such as Radio-Frequency Identification (RFID) tags and apps).[49]

- Aesthetic and functional packaging design made from higher quality and durable materials, to attract and retain customers, enable more product information on-pack and alternative design functions, such as decorative display.[50]

- Improved brand image and reputation, building customer relationships around sustainable, collaborative positive impacts, embedding reusable packaging systems as part of corporate sustainability strategy, providing organisations tangible evidence for sustainable packaging (e.g., in cosmetics).[51]

Benefits to the environment

Life cycle assessment (LCA) studies of reuse systems are typically used to quantify the environmental impact of packaging.

Studies have found significant environmental benefits of reusable packaging compared to single- use alternatives.

- Minimised CO2 emissions as a result of standardised packaging and shared logistics improving transportation efficiency. For example, an LCA comparing single-use and reusable packaging for takeaway food found that reusable polypropylene packaging emitted 93% lower greenhouse gas emissions than single-use polystyrene packaging.[52]

- Reduced energy use and waste production. For example, an LCA comparing reusable plastic containers to single-use display-ready corrugated board trays for vegetables and fruits distribution found the reusable containers require 39 per cent less total energy, produce 95 per cent less total solid waste and generate 29 per cent less total greenhouse gas emissions.[53]

An estimated 2.9 million tonnes of single-use packaging were avoided in 2019-2020 through eight established reusable packaging systems: kegs, pallets, milk crates, returnable plastic crates, reusable shopping bags,[54] drums, Intermediate bulk containers and reusable coffee cups. Approximately 91% of this avoided single-use packaging can be attributed to reusable pallets and beer kegs. The net theoretical reduction in packaging placed on the market was 2.7 million tonnes, as there were 0.2 million tonnes of reusable packaging identified in the market in 2019–20.[55]

Leverage the Opportunities of Reuse

Increasing the application of reusable packaging has previously been considered a challenge. However, with well-established reuse systems in B2B applications (pallets and drums) and increased traction in the B2C space, there are several opportunities for industry to investigate.

The following opportunities, separated for the B2B and B2C market, have been determined through extensive desktop research, consultation with the Australian packaging industry and collaboration with international reusable packaging leaders. The applicable reuse models to which these opportunities correlate, are highlighted in Table 2

Reuse opportunities in the Business to Consumer (B2C) market

Current trends indicate that consumer preferences are shifting towards less wasteful, more eco-friendly packaging options, so there are many opportunities which businesses can leverage to expand reusable packaging systems while achieving other business benefits.

These include: leveraging existing infrastructure, implementing smart systems, utilising return systems to encourage the return and recycling of other packaging, offering compact refills and concentrates, customising products, offering subscription services, sharing design, introducing consumer incentives, rolling out online ordering and home delivery services and producing attractively designed packaging.

Refer to Table 2 on the next page for details on each of the above.

Click on the list below to read more about the Opportunities of Reuse

- **Leverage existing infrastructure**
- **Smart systems**
- **Leverage return systems to encourage the return and recycling of other packaging**
- **Compact refills and concentrates**
- **Customisation**
- **Subscription services**
- **Shared design**
- **Consumer incentives**
- **Online and home delivery services with reduced barriers to market entry**
- **Attractive packaging**

Hover for descriptions

Refill at home

Refill on the go

Return from home

Return on the go

Table 2: Opportunities for reusable packaging in the B2C market

Opportunity	Description	Benefits	Example	B2C Reuse model
Leverage existing infrastructure	Use existing floor space in retail stores or container deposit scheme (CDS) drop-off locations, to return and refill packaging.	• More convenient for consumers to participate and could contribute to higher return rates for the existing program. • Reduced infrastructure or site costs. • Reduction in costs can be passed on to consumers to further encourage participation. • Increased foot traffic or exposure. • Shared logistics can decrease transport and logistics costs for collectors.	A range of **Coca-Cola** brands in Brazil utilise reusable bottles which can be returned to any retail store which sells the bottles.[56]	Refill on the go, Return on the go
Smart systems	Explore opportunities for digitisation throughout the supply chain and utilise the convenience of technology to engage consumers.	• Low-cost introduction of electronic tagging, to simplify and automate logistics while decreasing costs of packaging and distribution. • Simplified monitoring of packaging flows and inventories.[57] • Collection of data on consumer preferences and behaviours.[58] • Increased participation by adapting system of reuse to best suit the customers' needs.	**Canteen by Dig**, an American reusable take-away container program, uses QR codes at drop-off points to track their packaging and online ordering and subscription services to monitor the frequency at which consumers order refills.[59] MIWA, a European bulk refill system for reusable capsules, uses smart RFID or NFC technology labels to trace packaging, provide real-time sales information and gather packaging information to assist in recycling at end of life.[60]	Refill at home, Refill on the go, Return from home, Return on the go
Leverage return systems to encourage the return and recycling of other packaging	Use existing logistics networks for returning and / or recycling of other products.	• Reduced transport costs e.g., shared or reverse logistics. • Avenue for recycling products that may otherwise have been sent to landfill.[61]	**Cove** cleaning has partnered with REDcycle to ensure their plastic refill pouches are 100 per cent recyclable.[62] Oral-B has partnered with Terracycle to pilot reuse system for toothbrushes, leveraging the **Loop** platform to enable consumers to recycle exchangeable toothbrush heads.[63]	Return from home, Return on the go

Hover for descriptions

Refill at home **Refill on the go** **Return from home** **Return on the go**

Table 2: Opportunities for reusable packaging in the B2C market (CONTINUED)

Opportunity	Description	Benefits	Example	B2C Reuse model
Compact refills and concentrates	Offer compact refills, such as concentrates or tablets.	• Reduced transportation and packaging costs and their associated environmental impact.[64, 65] • Cost savings passed on to consumers can incentivise participation.	Blueland sells tablets which, when added to water in a reusable dispenser, combine to form hand soap.[66]	
Customisation	Explore the potential to expand customised products with decreased costs.[67]	• Packaging accommodated to customer individual needs can incentivise participation.	Some brands allow mixing of flavours or addition of desired fragrance to refills when ordered online (for example, SodaStream).[68] Others such as **Naked Foods**, offer dispensing systems with a choice of quantity and personalised content when refilling in store.[69]	
Subscription services	Offer subscription or auto-replenishment services.	• Increased convenience and brand loyalty. • Collection of data and insights on consumer behaviours. • Maintain consumers participation in reuse systems by offering direct home delivery of refills.[70]	**Neverfail**, an Australian water cooler delivery service, has successfully adopted a subscription model, operating across Australia since 1987.[71]	
Shared design	Standardise packaging or share supply chain logistics across brands, sectors or wider networks.	• Optimised operations. • Potential cost reduction to pass on to consumers. • Improved convenience and accessibility to consumers - for example: access to a higher number and density of drop-off points obtained through network collaboration.[72]	An Australian study found that a system of reuse integrating shared design was the most viable model for reusable takeaway containers in food courts and dining precincts.[73]	

Hover for descriptions

Refill at home

Refill on the go

Return from home

Return on the go

Table 2: Opportunities for reusable packaging in the B2C market (CONTINUED)

Opportunity	Description	Benefits	Example	B2C Reuse model
Consumer incentives	Offer incentives such as deposit or reward schemes.[74]	• Increased consumer participation in reuse systems.	**Just Salad**, an American restaurant chain, offers one free salad topping each time customers use their reusable bowl for takeaway orders.[75]	
Online and home delivery services with reduced barriers to market entry	Adopt online shopping and home delivery services.	• Easier entry to market for new companies, not facing high upfront costs such as renting a store front. • Not limited by existing relationships in the supply chain.	**Zero Co Australia** launched a web-based service accessible through the company's website and online store, to provide a range of a personal care and home-cleaning products directly to the homes of consumers.[76]	
Attractive packaging	Create aesthetically pleasing and functional packaging with high quality, durable packaging materials.	• Customer attraction and retention. • More in-depth product and brand information can be communicated.	**Keep Cup** sells reusable coffee cups in a range of materials, colours and designs, and also allows consumers to design their own cup.[77]	

Sectors with growth opportunities for reuse in the B2C market

As noted above, with a prediction for the worldwide sustainable packaging market reaching USD$297 billion by 2024,[78] the innovation prospect presented by replacing 20 per cent of global single-use plastic packaging with reusable alternatives, is estimated to be worth at least USD10 billion.[79] Moreover, with Australian consumers showing increasing interest and motivation to reuse rather than buying new items,[80] there is considerable potential to expand the use of reusable packaging in Australia and an extensive business opportunity to tap into (as detailed in the case studies). Examples of successfully implemented and scaled systems of reuse in the B2B market, such as **Kegstar** and **CHEP**, indicate that these formats can be leveraged and expanded to further realise the economic and environmental benefits in other applications, in particular within several sectors in the B2C market:

Home and personal care

The home and personal care industry has recently demonstrated an uptake in the use of refill models.[81] These include both bulk dispensers, refill on the go and refill at home through concentrated refills - see **Zero Co**, **Cove Cleaning** and **Kao Group** case studies.

Retail

Some of the biggest global brands are focusing on introducing reusable packaging to phase out single-use plastics.[82] Many retailers are working to test and expand existing refill and return offerings through their stores and e-commerce platforms[83] - see **Naked Foods** and **Loop** case studies.

Beverages

The global reusable water bottles market is set to reach US$1.1 billion by 2027.[84] Almost one in five consumers purchased a reusable water bottle in 2018-19, and over a quarter of those were aged 16 to 24 years old.[85] Adoption of reusable water bottles has helped to popularise the use of reusable packaging across the wider beverage industry - see **Heineken** and **Coca Cola** case studies. Similarly, companies such as SodaStream, which offers a refill at home beverage solution, has

continued to grow since its inception in 1903 and now operates in 45 countries worldwide.[86] Business like PepsioCo are now also exploring reuse opportunities by deploying their flavours via the SodaStream customer base and model.[87]

Takeaway

In 2013, six tonnes of polypropylene (PP) plastic waste were created daily from disposable food containers in the City of Sydney,[88] and in 2018/19 there was a reported 35,000 tonnes of plastic packaging consumed in the "Business-to-consumer (B2C) – Away-from-home" market.[89] With the size of this market, it is clear why locally and globally there has been an increase in reuse models for takeaway food and drinks - see **ReturnR** and **GO Box** return, **Just Salad** case studies. The uptake in reusable packaging for takeaway food is further supported by a 2020 report which found that reusable take-away food packaging, if reused enough times, has a better overall environmental performance than single-use packaging.[90]

Reuse opportunities in the Business to Business (B2B) market

Reusable systems and practices are well established in the B2C supply chain. The logical next step for industry is to explore opportunities for increasing uptake of these systems, to maximise impact across the supply chain. The opportunities outlined below encompass the most common applications for reuse currently found in B2B packaging. These include pooled packaging such as pallets, and reusable distribution packaging, such as crates for fresh produce and kegs for beer and other beverages.[91] Current estimates state 35 per cent of all transport packaging globally is reusable, driven mainly by the cost-savings and handling efficiencies offered by reusable transport packaging systems.[92]

Additional opportunities exist for businesses to expand into and further leverage the known cost-savings and handing efficiencies in the B2B market, such as: implementing smart systems, standardising packaging formats, leveraging return systems to encourage the return and recycling of other packaging, sharing design and reducing transportation costs.

Refer to Table 3 for details on each of the above. The applicable reuse models to which these opportunities correlate are highlighted in Table 3.

Click on the list below to read more about the Opportunities of Reuse

- **Smart systems**

- **Standard packaging formats for logistic efficiencies**

- **Leverage return systems to encourage the return and recycling of other packaging**

- **Shared design**

- **Reduced transportation and packaging costs**

Table 3: Opportunities for reusable packaging in the B2B market

Hover for descriptions · Individual adoption · Single industry pooling · Multi-industry pooling · Physical internet

Opportunity	Description	Benefits	Example	B2B Reuse model
Smart systems	Explore opportunities for digitisation, such as digital labelling.	• Low-cost electronic tagging can simplify and automate logistics and bring down costs of packaging and distribution. • Simplified and highly detailed monitoring of flows and stocks of packaging.[93]	**Kegstar**, a global pooled system of reusable kegs, provides kegs uniquely identified by a 2D barcode with a custom-made tracker utilising Bluetooth and RFID technology.[94]	

Hover for descriptions

Individual adoption Single industry pooling Multi-industry pooling Physical internet
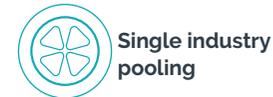
Table 3: Opportunities for reusable packaging in the B2B market (CONTINUED)

Opportunity	Description	Benefits	Example	B2B Reuse model
Standard packaging formats for logistic efficiencies	Investigate options to standardise packaging dimensions to reduce handling of product along the supply chain.	• Reduced costs, handling time and environmental impacts through more efficient logistics, less need for transport vehicles, labour and other transport related resources.[95]	**CHEP**, a global B2B logistics company, supplies businesses with pallets which can be used for transportation through to in-store display, eliminating the need for multiple handling to reach the point of sale.[96]	
Leverage return systems to encourage the return and recycling of other packaging	Facilitate return and / or reuse / recycling of other products.	• Reduced business environmental impact by encouraging recycling and reducing packaging waste. • Increased business service offering and/or consumer relations.	**Euro Pool** Group facilitate the return of their pallets and crates and also offer return services for beer bottles and other materials that are either returned to the producers (in the case of beer bottles, for example) or taken to recyclers (e.g. paper and plastic). They reduce transport costs and provide an avenue for recycling products that may otherwise have been sent to landfill.[97]	
Shared design	Supply chain alignment and stakeholder cooperation is critical for viability of reusable B2B packaging. This is likely more achievable for larger retailers, suppliers and logistic companies with greater control along the supply chain.[98]	• Optimised operations and potentially reduced costs, which can be passed on to customers. • Improved convenience and accessibility, with a higher number and density of facilities to be utilised through network collaboration.[99]	Local producers and major retailers across Australia, implement **CHEP's** Reusable Plastic Crates for fresh produce.[100] TIC Group, a global garment hanger and logistics company, transports garments for a range of brands on standardised coat hangers that in turn can be reused.[101]	
Reduced transportation and packaging costs	Shared design and logistic efficiencies, reduces the quantities of packaging materials, prolongs the lifespan of durable, reusable packaging materials, and avoids waste and recycling costs.[102]	• Accumulated long-term cost savings.	**John Deere**, a global industrial machinery manufacturer, has reduced costs by using reusable packaging – an 85% cost reduction is from avoided expense of expendable packaging, and 7% attributed to greater density of materials in transit.[103]	

Consider the Challenges, Adapt the Solutions

When planning any shift in packaging and its recovery pathway, there are some key considerations for businesses choosing to implement and participate in reusable packaging systems. Any changes to delivery models, costs and formats of familiar products and services which previously relied on single-use packaging, or introducing novel developments into the market, will require planning, communication and support for customers. System owners and operators will require some modifications to their business practices. Promisingly, there are existing examples and possible avenues to successfully roll out reuse systems.

Tables 4 and 5 detail the key considerations for businesses to anticipate and some recommended solutions to assist in overcoming potential challenges when implementing reusable packaging systems. For customer and consumers, these considerations may include information barriers, motivation, affordability, health and safety concerns, and accessibility. Businesses may need to consider aspects such as motivation, costs, geographical elements, quality health and safety requirements, supply chains, industry investment, loss of packaging from the system and environmental impact. The tables also depict under which reuse models these challenges may arise.

Keep customer convenience in mind when designing and implementing reuse systems to ensure broad, long-term and continuous adoption

Click on the lists to the right to read more about the Considerations

Table 4: Consider the customer and consumer

- Information barriers
- Customer motivation
- Affordability and upfront investment
- Quality, health and safety concerns
- Accessibility to reuse systems

Table 5: Consider the business needs (system owner/operator)

- Business motivation
- Start-up and ongoing costs
- The Australian geography
- Quality, health and safety requirements
- Global supply chains
- Lack of industry investment, consultation and collaboration
- Loss of packaging from the system
- Environmental Impact

Hover for descriptions · **Refill at home** · **Refill on the go** · **Return from home** · **Return on the go** · **Individual adoption** · **Single industry pooling** · **Multi-industry pooling** · **Physical internet**

Table 4: Customer- and consumer-related challenges and solutions, for businesses to consider when implementing systems of reuse

Consideration	Challenges	Recommended Solutions	B2C Reuse model	B2B Reuse model
Information barriers	Novel, innovative, new or unknown models of reusable packaging leading to low uptake and customer confusion.[104]	• Provide informative, targeted marketing and educational materials highlighting potential benefits for the consumer and the environment. • Convey clear information regarding the geographic reach of the reuse system. • Provide communication as early as possible, to prepare consumers for this change and to realise the benefits from the model from launch.		
Customer motivation	Low awareness of reusable packaging and upfront costs dissuading consumers from participating.	• Accompany development and implementation of reuse models with comprehensive communications strategy to equip consumers/ end users with knowledge and confidence in reuse:[105] • Provide instructions on how to return packaging, • Educate consumers on the individual and environmental benefits. • Incentivise participation by offering discounted refills.		
Affordability and upfront investment	Upfront investment or an ongoing fee (e.g., buy a reusable cup, pay a returnable deposit or incur an ongoing subscription fee. Businesses pay to participate in shared logistic systems).	• Implement targeted marketing schemes illustrating the benefits and long-term cost-effectiveness of reusable packaging to assist end users in justifying any upfront costs. This could include a comparison of the upfront cost to the ongoing social, environmental and economic before costs incurred with single-use items. • See **Neverfail** and **CHEP** case studies.		
Quality, health and safety concerns	Consumer perceptions of the safety of reusable packaging (e.g., COVID-19).[106]	• Highlight evidence showing: • Health and safety risks associated with single-use and reusable packaging are no different.[107] • Durable, reusable packaging can reduce product damage during transit and handling, and ventilation can help to keep perishable items fresher for longer.[108] • Raise customer awareness of the safety of reusable packaging and educate consumers of cleaning and hygiene practices in the system of reuse.		
Accessibility to reuse systems	Consumers living in regional and remote areas, or those in low density populations, may not have access to reuse systems.	• When advertising a system of reuse, adhere to Australian Consumer Law stating that businesses must not make false or misleading claims or statements,[109] and effectively inform consumers of where the system is available. • Investigate opportunities to work with local groups in regional or low-density areas, to make these systems available and accessible.		

Hover for descriptions

Refill at home

Refill on the go

Return from home

Return on the go

Individual adoption

Single industry pooling

Multi-industry pooling

Physical internet

Table 5: System owner/operator-related challenges and solutions, for businesses to consider when implementing systems of reuse

Consideration	Challenges	Recommended Solutions	B2C Reuse model	B2B Reuse model
Business motivation	Hesitation to change operations and concerns over brand image.[110] A belief that customers are unwilling to shift to reusable packaging. Lack of awareness of the potential benefits and opportunities of reusable packaging, including financial benefits.[111]	• Set up an exceptionally timely and reliable collection service to avoid any reputational damage. • Engage customer base to educate on reuse benefits and identify appetite for change – utilise data to inform strategy for delivery of desired customer behaviour change. • Reuse models should be adopted where they are suitable; develop a strong business case for adopting a reuse model for packaging. • Align Reuse systems with broader business sustainability objectives / commitments – potential for positive impact on Scope 3 emission reduction activities.		
Start-up and ongoing costs	Capital, logistics, retraining and labour costs incurred when business transitions to reusable packaging in their B2B or B2C market. Short-term transitional costs in production of marketing collateral to ensure end-consumers are aware of the upcoming change to their packaging and behaviours.	• Compare costs at a medium-long term scale, as reusable packaging can be more cost-effective than single-use packaging once implemented, due to cost savings associated with transport and packaging efficiencies.[112] • See **John Deere** case study.		
The Australian geography	Feasibility barriers particularly in rural and remote areas with low population density. A system of reuse may not be feasible due to high transportation costs. Also see Environmental Impact consideration below.	• Consider that high transportation costs may be offset by cost efficiencies gained in other parts of the supply chain, such as reduced handling and material costs.[113] • Implementing systems of reuse at a local level may also offer a feasible model for reusable packaging in low density populated areas.		

Hover for descriptions

Refill at home

Refill on the go

Return from home

Return on the go

Individual adoption

Single industry pooling

Multi-industry pooling

Physical internet

Table 5: System owner/operator-related challenges and solutions, for businesses to consider when implementing systems of reuse (CONTINUED)

Consideration	Challenges	Recommended Solutions	B2C Reuse model	B2B Reuse model
Quality, health and safety requirements	Mandatory resources and policies to ensure end users' health and safety, especially in food and beverage products. Reuse systems require cleaning capacity to sterilise packaging in between uses and packaging inspection to monitor material condition and ensure suitability and safety for reuse - particularly for glass packaging. Risks may also arise at in-store locations, such as refill stations, where businesses are liable for the safety of customers.[114]	• Adhere to clear guidelines in the Australian market, such as the Food Safety Standards, which outline processes to ensure the health and safety of end users.[115] • Produce targeted marketing to reassure end users that the system of reuse is safe to participate in. • Careful consideration of reusable scheme design can mitigate perceived risks at the point of consumer contact.		
Global supply chains	Complexities such as customs handling and long transport distances,[116] where businesses operate offshore reuse supply chains (see **PACT Retail Accessories** case study)[117] Similarly, as many Australian products or supply chains operate globally, some packaging may need to be returned offshore to be refilled.[118]	• Investigate successful systems of reuse demonstrating the feasibility of reuse systems at a national level (see **Cove Cleaning**, **Naked Foods**, **Neverfail** water coolers and **ReturnR** case studies). • Organisations can investigate opportunities such as government investment and grants, to support the development of reusable system capacity domestically. An example of this was the 2020 announcement of a partnership with Pact Group and industry to invest in existing and new facilities. These facilities are for sustainable packaging, reuse and recycling initiatives over five years, as well as investing in innovation, technology and research to use more recycled content in packaging.[119]		

Hover for descriptions

Refill at home **Refill on the go** **Return from home** **Return on the go** **Individual adoption** **Single industry pooling** **Multi-industry pooling** **Physical internet**

Table 5: System owner/operator-related challenges and solutions, for businesses to consider when implementing systems of reuse (CONTINUED)

Consideration	Challenges	Recommended Solutions	B2C Reuse model	B2B Reuse model
Lack of industry investment, consultation and collaboration	Efforts to attract investment for establishing new systems of reuse. Barriers in accessing shelf space previously used for single-use products when selling reusable packaging through retail stores. Consolidation of retail channels into small format store layouts – declining real-estate available to house multiple reuse stations.	• Capitalise on the appetite in Australia to support reusable packaging start-ups (e.g., **Zero Co**, an Australian cleaning brand, secured $2 million in seed funding, including $742,427 raised through an online Kickstarter campaign in 2019.[120] • Champion the benefits of reusable packaging to retailers and show proven customer demand for environmentally conscious products. • Undertake extensive consultation to support packaging development and ensure viability,[121] and identify risks in implementing a reuse system. • Design reuse systems to maximise location efficiency – collaboration with category-relevant brand owners to create multi-brand or mulit-category systems.		
Loss of packaging from the system	Costs associated with packaging that must be replaced due to damage or low return rates. Volumes need to be maintained to ensure sufficient packaging exists in the reuse system to continue efficient operation.[122]	• Incentivise returns by implementing a returnable deposit fee (see **Coca-Cola** Brazil case study).[123] • Develop customer incentives in conjunction with reuse system, to reward on-going system engagement and maintain required return rates. • Implement a tracking system (e.g., RFID technology) to trace packaging along supply chains,[124] (see **Kegstar** case study).[125]		

Hover for descriptions

Refill at home   **Refill on the go**   **Return from home**   **Return on the go**   **Individual adoption**   **Single industry pooling**   **Multi-industry pooling**   **Physical internet**

Table 5: System owner/operator-related challenges and solutions, for businesses to consider when implementing systems of reuse (CONTINUED)

Consideration	Challenges	Recommended Solutions	B2C Reuse model	B2B Reuse model
Environmental Impact	Geographical distances and fill rates have been found to be the most influential factors in determining environmental impact, compared with single-use packaging. The impact of water use for packaging cleaning and the materials used in packaging design should also be considered in order to avoid unintended consequences.[126] For example, replacing recyclable single-use containers with unrecyclable reusable materials; using a greater volume of materials or a more energy-intensive production process.	• Offset impacts by designing a reuse system and packaging that ensure the minimum number of cycles can be achieved prior to removal from the system for reprocessing / replacement. • A Life Cycle Assessment (LCA) can calculate the environmental impact of products and quantify the potential environmental impacts at each stage of a product's life cycle (from raw material extraction through production, use, and waste treatment to final disposal). • LCAs can also assist with establishing robust minimum reuse cycle numbers, based on system inputs. This can aid business in identifying the sustainability 'break-even' point for a reusable format. For example, a reusable format may only show environmental benefits after 10 uses, due to the additional materials required to offer durability and reusability – thus, the minimum cycles should always be above 10. • Consult expert guidance when interpreting the results of the LCA to understand and compare the environmental impacts of single-use plastic products.[127] • Refer to the **Sustainable Packaging Guidelines (SPGs)**[128] when reviewing existing packaging and opportunities to adopt reusable packaging models. The SPGs provide 10 key principles for sustainable packaging, including supporting resources on selecting suitable recovery pathways such as reuse.		

Start the Journey to Develop a Reusable Packaging Solution

To successfully implement reusable packaging, both the packaging design and the system of reuse in which the packaging exists need to be considered.

The below framework steps out the key criteria that organisations can use when seeking to develop or shift their product into a reusable packaging model. In assessing the suitability of a reusable packaging model, this framework will support to ensure it is fit for purpose, practical and accessible.

Is the packaging fit for purpose?
The reusable packaging is able to perform its intended purpose and designed for reuse in a dedicated system, in line with international definitions for reusable packaging.

Criterion	Key Questions
The packaging is designed to accomplish a minimum number of trips (or reuse cycles) and be used again for its original purpose, in a specific system of reuse.	• How many trips / cycles has the packaging been designed to complete in the system of reuse, before reaching end-of-life or retirement from the reuse system? • Has the packaging been designed to be reused for its original purpose?
The system of reuse fits one or more of the reuse models	• Who owns the packaging? • Which model(s) of reuse has the packaging been designed for?
More than half of the packaging components by weight or volume is reusable.	• What is the proportion of reusable components in the packaging, listed by material, weight or volume?

Is the packaging practical for reuse?
The packaging is designed in a practical way so it can be reused as many times as possible in its system of reuse.

Criterion	Key Questions
The packaging is able to complete a minimum number of trips (or reuse cycles) before end-of-life.	• If a Life Cycle Assessment has been conducted: How many reuse cycles does the packaging need to complete to have an environmentally neutral impact? • If not, how many reuse cycles has the packaging been designed to complete in its system of reuse, before reaching end-of-life/retirement from the reuse system?
The time it takes for the packaging to complete one reuse cycle is proportional to the time it takes to consume the product, under normal conditions.	• What is the estimated average cycle time for the packaging? • What product was the packaging designed to hold? • How long should it take to consume the product within the packaging?
The packaging is recyclable upon retirement from the reuse system, via an existing resource recovery pathway.	• Is each packaging component classified as recyclable through assessment via the Packaging Recyclability Evaluation Portal (PREP)? • If not, can a dedicated recycling program be established within the framework of the reuse system to recover the packaging at end of life?

How accessible is the system of reuse?

The system of reuse is easily accessible to a reasonable proportion of customers in the local market.

Criterion	Key Questions
Packaging that is intended for refill at home	
The customer can buy refills within close range of the initial point of purchase or online.	• How can customers purchase refills? • Can refills be purchased at the point of initial purchase? • How many locations are available to purchase refills? • What is the average distance or travel time between the initial point of product purchase and locations to purchase refills?
Packaging that is intended for refill on the go	
The customer is able to buy refills within close range of the initial point of purchase or online.	• Are refills possible at the point of initial purchase? • Where can customers refill the packaging? • How many refill locations are available? • What is the average distance or travel time from the refill station to the initial point of product purchase?
Packaging that is intended for return from home	
An organisation has the capacity to collect all packaging within the system of reuse.	• How does the customer return the packaging? • What is the geographic reach of the collection service? • How often can collections be conducted?
Packaging that is intended for return on the go	
The customer must be able to return the packaging to a convenient drop-off location within close range of the initial point of purchase. If purchased online, the packaging should be able to be returned at a drop-off location within close range of the home or through the postal system.	• Are returns possible at the point of initial purchase? • Where can customers return the packaging? • What is the average distance or travel time between the return locations and initial point of purchase? Is it within range of a commonly or frequently visited location? • How many return locations are available to Users? (This may include agreements with third-party locations which accept returned packaging from customers).

Does the packaging require cleaning and inspection in between uses?

If the **customer** needs to clean the packaging, they should be able to do so with normal household products or be provided with the necessary cleaning products when purchasing the packaging.

Otherwise, **Organisations** should have the facilities and resources needed to clean and inspect the returned packaging in between uses, ensuring that there are no health or safety risks to the subsequent user of the packaging.

Refer to the relevant health and safety standards for the applicable product.

Get Inspired: Case Studies

Many examples of reusable packaging have been successfully implemented in B2B and B2C markets in Australia and globally. While businesses across industries utilise reusable packaging for logistics in the B2B market, currently, the main industry sectors driving reusable packaging in the B2C market include food and beverage, take-away and ready meals, grocery shopping, home care and personal care.

The following case studies represent some of the best-practice systems of reuse from Australia and around the world. These have been categorised under each of the eight reuse models for organisations to explore tangible examples of how these systems work in-practice in the market today.

Click on a company to learn how they incorporate reusable packaging into their business structure.

Business to Customer - Refill from home

- Cove Cleaning (Australia)
- Kao Group (Japan)
- Zero Co (Australia)

Business to Customer - Refill on the go

- KeepCup (Australia)
- Just Salad (USA)
- Naked Foods Organic Health Foods (Australia)
- Heineken (France)

Business to Customer - Return from home

- LOOP: Carrefour partnership (Global and France)
- Neverfail water coolers (Autralia)

Business to Customer - Return on the go

- Coca-Cola (Brazil)
- Green Caffeen (Australia)
- Canteen by Dig (USA)
- GO Box (USA)
- ReturnR (Australia)

Business to Business – Single industry pooling

- PACT Retail Accessories (formerly TIC) (Global & Australia)
- Kegstar (Australia, UK & Ireland, USA, New Zealand and the Netherlands)

Business to Business – Multi-industry pooling

- CHEP: A Multi-industry Partnership (Australia)

Business to Business – Physical internet

- Euro Pool Group (Europe)

Business to Business – Individual adoption

- John Deere (Global)

Business to Consumer – Refill from home

Cove Cleaning (Australia)

A household cleaning product reuse system comprised of reusable heavy-duty aluminium bottles which are owned by the consumer and are recyclable through kerbside at end of life, alongside refill pouches which can be purchased online or at participating supermarkets, are recyclable through REDcycle.

The Cove website offers a starter kit with four reusable bottles and accompanying refill pouches. The three cleaning products contain a concentrated formula which customers empty into their reusable bottle and top up with water. The laundry liquid is a "hyper concentrated formula" and takes advantage of the water already in the washing machine in use, so there's no need to mix water at home.

The concentrated solution reduces the weight of the product and size of packaging, resulting in less emissions released in transport and lower transportation costs.[129]

The bottles have been designed for continuous reuse: replacements are available for consumers if the trigger or pump breaks[130]

As well as environmental benefits, the company reports that the aesthetically pleasing bottles have also attracted customers to participate in and purchase Cove.

Natures Organics launched their Cove refill system for household cleaning products in July 2020.

Business to Consumer – Refill from home

Kao Group (Japan)

A diverse portfolio of over 350 household refillable products, packaged in reusable plastic and designed to hold a variety of products such as shampoo and detergent.

Kao's key packaging designs include:

- Smart Holder: A reusable soap dispenser that houses fit-for-purpose refill packs.
- Eco Pack Refill: made of a thin film designed to contain high viscosity products, such as shampoo and body cleaners, which can be emptied into a Kao reusable container. The thin film assists in avoiding product waste during refill.
- Pour type refills: A refill pack designed with a spout that ensures easy transfer of product into reusable containers.
- Insertion type refills: A specially designed refill pack for powders, preventing powder from being spilt or leached into the air.

Since 1997, Kao has rapidly increased the ratio of reusable products in proportion to its unit sales. The refill ratio for fabric softener and fabric bleach, for instance, has exceeded 90 per cent.

In addition to the benefits of the reusable packaging, the refill and replacement packaging has been made more compact, enabling Kao to reduce plastic consumption from by 70,200 tonnes[131]).

Zero Co (Australia)

An online system for delivering personal care and home cleaning products directly to customers, implementing both refill from home and return on the go reuse models.

Zero Co's service is accessible through the company's website and online store. Once items are purchased, consumers follow four steps to participate in the reuse service:

1. The first Zero Co order arrives at the home of the consumer, including a set of empty dispensers along with colour-matching refill pouches and a reply-paid postage satchel.

2. The consumer empties the contents of the refill pouches into the dispensers.

3. The empty refill pouches can be placed into the reply-paid postage satchel and sent back to Zero Co for free.

4. Zero Co cleans, refills and reuses the pouch.

In additional to being reusable, the dispensers are made from ocean waste plastic and the refill pouches are made from recycled materials diverted from landfill.

Zero Co officially launched its website and started to take orders in May 2020 and deliveries started in November 2020.[132]

Business to Consumer – Refill on the go

KeepCup (Australia)

A reusable, customisable hot beverage cup to replace single-use non-recyclable alternatives.

Founded in 2007 by Melbourne-based café owners who were motivated to minimise the impact of the non-recyclable single-use coffee cups their customers were using every day, KeepCup was designed to provide a practical solution that fits the standard coffee cup size used by baristas, as well as an optimised user experience to consumers.[133]

KeepCup promote a 'buy once, buy well' motto by offering a range of customisable cup components, including replaceable lids and cup holders, which can be purchased through the KeepCup website and retail stores, and can be cleaned by consumers in a dishwasher or by hand.[134]

KeepCups are used in more than 75 countries around the world, diverting millions of single-use cups from landfill each year.[135]

KeepCup recently launched an online Impact Calculator, that enables individuals and companies to forecast and track their impact, including the energy, carbon and waste savings made by switching to reuse.[136]

KeepCup conduct a Life Cycle Analysis of their products to help guide decision-making and identify hotspots in supply chains. The 2018 third party, peer reviewed LCA, and the 2020 addition to it, which covers the new KeepCup Thermal, is publicly available online for transparency and to empower others with strong environmental data that can aid decision making. The LCA found after 60 uses, KeepCup Thermal has a lower environmental impact than disposable cups.*[137, 138]

KeepCup are also partnering with over 5000 companies globally to provide B2B solutions and promote reuse.[139]

Business to Consumer – Refill on the go

Just Salad (USA)

A restaurant chain committed to sustainability, championing the Reusable Bowl program which eliminates single-use plastics and fosters brand loyalty.

To show tangible commitment to sustainability, Just Salad runs a number of sustainability initiatives. The Reusable Bowl program is claimed to be one of the world's largest restaurant reusable packaging programs.

Consumer's pay US$1 to purchase a polypropylene bowl with their first order, are then incentivised to reuse by offering one free salad topping each time they order a salad using their bowl.

The bowls are dishwasher-safe and the restaurant has avoided any health and safety concerns by ensuring the bowls never directly touch the workstations.[140]

Just Salad's Reusable Bowl program was launched in 2006[141] and in 2019 it reported eliminating more than 34,000 kilograms of plastic waste every year and has received recognition from the Environmental Protection Agency as a regional Waste Wise Award winner.[142]

Naked Foods Organic Health Foods (Australia)

A chain of organic food stores, encouraging customers to bring and refill their own reusable packaging.

Naked Foods sell spices, nuts, flours and dried fruits by weight. Produce is purchased from suppliers with limited packaging, allowing consumers to purchase according to their requirements.

Customers are encouraged to bring their own reusable packaging, which can be filled by a scoop from the drums. Incentive is provided as a five per cent (5%) discount to those that do bring their own reusable packaging.

Customers who do not bring reusable packaging have access to brown paper bags which can then be recycled at home.

Naked Foods was established in 2012 in Sydney and currently has 21 stores located throughout Australia.[143]

Business to Consumer – Refill on the go

Heineken (France)

Replacing single-use bottles with draught beer dispensers in retail outlets, to allow customers to purchase beer in reusable bottles.

Heineken is trialling the use of dispensers through a pilot program in France, in partnership with local brewer Gallia Paris at the new Monoprix Montparnasse.

The system incentivises customers to reuse the glass bottles or return them to store if they choose to stop refilling them. The trial also sources local beer to reduce the carbon footprint involved in transport, elevating the sustainability of the product as well as the packaging.[144]

The trial that commenced in 2020 made three local craft beers available via a new smart dispenser technology, providing insights as to how to deliver the concept to scale, with an expanded pilot to be launched in three more countries during the next phase.

Business to Consumer – Return from home

LOOP: Carrefour partnership (Global and France)

A zero-waste shopping platform enabling consumers to get their well-known brands in durable and reusable containers, rather than single-use plastic packaging.

Within Loop's platform, consumers are able to opt-in for their conventional products in reusable packaging while shopping in store or online at participating retailers around the world. At checkout, consumers pay a small deposit for the reusable packaging, which is refunded to them in full upon the packaging's return. Once the products have been consumed, the empty packaging is dropped off to an in-store collection point, and the amount of the deposit is refunded via the Loop app. The packaging is then professionally cleaned and sanitised at Loop's state-of-the art cleaning facility before being sent back to brands to be professionally refilled. As such, this system qualifies as a 'return on the go' model.

The platform was launched at the World Economic Forum in 2019 and is now available across the United States, Canada, United Kingdom, France and Japan. Loop is also expanding to the Australian market in early 2022 in partnership with Woolworths.

This innovative circular packaging system has over 200 brand partners globally, including the global support of companies like PepsiCo, Unilever, Nestle and Procter and Gamble. Loop continues to launch innovative new platforms to create a network of reuse across multiple industries including fast food restaurants, beauty retailers, municipalities and commercial spaces.[145, 146, 147]

Neverfail water coolers (Autralia)

A delivery model for drinking water, servicing households and businesses in reusable returnable bottles.

Neverfail was established in 1987 and is Australia's largest spring water brand offering home, office and industrial delivery of water coolers and refills.

To participate in the service, customers (either businesses or individuals) rent a water cooler and with Neverfail's guidance, nominate how many bottles they will need and how often they will need to be replaced.

After the initial purchase, a Neverfail Customer Service Representative will collect the empty water bottles when delivering a replacement - capitalising on reverse-logistics opportunities, driving efficiencies in the supply chain and providing easy access to customers for return schemes.

Most Neverfail bottled Springwater is sold in 11 or 15-litre polycarbonate bottles which are collected at each delivery, returned to the bottling plant, thoroughly washed and sanitised, and refilled an estimated 40 times over several years of use (up to five years). On disposal, the bottles are recycled and used to manufacture other plastic products.

Neverfail is committed to reducing their environmental impact. Each litre of water filled at their manufacturing plants uses the same amount of energy as one energy-efficient compact fluorescent light bulb.

Transport costs are kept to a minimum by distributing bottled water on a local level from one of six distribution centres around Australia. A typical Neverfail bottled spring water operation sources and distributes most of its product within 100 kilometres of its bottling plant and distribution centre, the only exception being remote mine sites.[148]

Business to Consumer – Return on the go

Coca-Cola (Brazil)

A uniform, reusable plastic bottle designed to suit multiple brands, with an added reward for customers to return to store.

In 2018, Coca-Cola Brazil invested USD $25 million to a create and design a reusable PET bottle that can be used across multiple Coca-Cola brands, and additional USD $400 million in expanding their bottle cleaning and refilling facilities, as part of their aspiration to significantly scale up their reusable packaging by 2030.[149]

All two litre bottles across Coca-Cola, Fanta and Sprite brands in Brazil are now sold in reusable bottles that are the same colour, shape and size, which increases the efficiency of collection, cleaning and filling. The bottles can be reused up to 25 times, in total replacing 200 million single use bottles each year.

Customers pay an indirect deposit when purchasing a beverage in a refillable bottle, receiving a discount on their next purchase when they return the empty bottle to a store. This reward system ensures a high return rate of above 90 per cent. Coca-Cola collects the empty bottles from retailers when delivering subsequent orders. Coca-Cola brings the multi-branded mix of bottles back to a bottling facility where paper labels are washed off and bottles are cleaned, refilled, and rebranded with a fresh label before being redistributed.[150]

The universal bottle is now in use in Argentina, Brazil, Chile, Colombia, Mexico, Guatemala and Panama. As of 2020, reusable bottles represented 27% of transaction sales in Coca-Cola Latin America and were the fastest-growing packaging format in 2018 and 2019.

The Coca-Cola Company is also increasing refillables in other markets including across Latin America, Africa and Europe. Chile, for example, partnering with Petrobras in 2020 to launch a pilot to sell returnable bottles in convenience stores, supporting reuse and a circular economy. Coca-Cola Beverages South Africa (CCBSA) expanded the rollout of a 2-liter refillable PET (RefPET) plastic bottle following a successful pilot in 2019 along the Eastern Cape. The packages, which include a paper label with "returnable" appearing on a green strip, can be cleaned, refilled and reused up to 14 times before being recycled and made into new PET bottles. Coca-Cola Peninsula Beverages (PenBev), our bottling partner for the country's Western Cape, offers a 1.5-liter RefPET bottle. These initiatives incentivize consumers to reduce waste and boost overall PET collection efforts.[151, 152]

Business to Consumer – Return on the go

Green Caffeen (Australia)

A swap-and-go app and system for reusable coffee cups.

Green Caffeen customers can sign up to the service via a mobile app, which provides them with access to the cups free of charge. To participate, customers download the app before visiting any participating cafe where they can check out a Green Caffeen cup.

Once consumers are finished using the cup, they have 30 days to swap, drop or grab a fresh cup at any participating cafe. If the cup is not returned within 30 days, a fee of $12.99 is charged to the customer. This provides an incentive for customers to return the cups and ensures that new cups can be added to the pool of reusable packaging where necessary.

Green Caffeen cups are made in Australia from a blend of recycled material, and to date, the company has partnered with over 700 cafes and served 25,000 customers with over 800,000 single use cups avoided"[153]

Canteen by Dig (USA)

The first New York City restaurant to offer a closed-loop program for take-away containers

Dig's customers pay US$3 a month to participate in the service, which they can access through the Canteen by Dig smartphone app.

Participating customers are provided with a hard-shelled, reusable bowl made from black melamine and white plastic lid for their take-away meal, which can then be exchanged for a clean bowl during each subsequent visit. This is a significant undertaking that requires the restaurant chain to store, clean and maintain a fleet of reusables.

To return the bowl, customers must go to a Dig restaurant and scan a QR code to check-in the bowl before leaving it in a designated return container.

There is no limit to the number of times customers can check out and return a bowl each month. However, they are limited to having one bowl at a time.[154]

Business to Consumer – Return on the go

GO Box (USA)

A circular system connecting food vendors and customers through reusable containers and cups.

The GO Box system operates across the city of Portland, allowing customers to order meals in a GO Box from any registered business. The GO Box team manages all of the logistic and washing services, so it's convenient and cost effective for businesses to offer reusables.

To access the system, customers purchase a monthly or annual subscription which allows them unlimited borrows and returns and the ability to have up to four containers at a time. Containers can be returned at any drop-off point around Portland (located in selected registered businesses), and customers confirm the return of the packaging by scanning a QR code.

The GO Box containers are made of polypropylene, which is highly resistant to heat transfer and is very durable. The lightweight material allows GO Box bike couriers to collect the containers from drop-off points and the durability allows the containers to be cleaned in a high-heat commercial washing machine. The containers can be used up to 300 times before reaching their end of life, at which point they are sent to a local recycling facility.[155]

To date, GO Box report to have diverted over 200,000 single-use containers and cups from landfill, amounting to 16 tonnes.[156]

ReturnR (Australia)

Reusable packaging solutions for takeaway food and drinks.

ReturnR is an Australian business which offers a set of ready-to-borrow twin-walled stainless-steel cups, bowls and canisters. The twin-walled design provides insulation for hot and cold food and beverages, while the stainless-steel is an inherently safe and hygienic surface that doesn't hold on to odours or stains when washed at a high temperature.[157]

The borrowing system requires no scanning, no app downloads, no credit card details and no personal contact details. Customers opt in to use a ReturnR bowl or cup when purchasing their food or drink at participating retailers.

Customers pay a $6 deposit to participate in the service which is refunded when the packaging is returned. All items can be used without a lid or with a 100 per cent recyclable moulded cardboard lid. Additionally, reusable silicone lids are also available for purchase.

ReturnR also offers a 'Workplace Micropool' where products purchased (and owned) by businesses to create a reusable resource pool from which staff can borrow, free of charge.[158]

In its initial four-month trial, ReturnR is estimated to have saved 85,000 bowls from landfill.[159]

In 2021 RetunR are planning to trial a membership-based service for delivery of groceries, liquor and premade meals from boutique and specialty brands in reusable packaging, which will also include collection and washing of empty packaging.[160]

Business to Business – Single industry pooling

PACT Retail Accessories (formerly TIC) (Global & Australia)

An advanced world-wide logistics network to provide a closed-loop plastic garment hanger reuse program for retailers and manufacturers.

More than 400 million hangers are reused annually through the program, with many retailers achieving a reuse rate of 80 per cent.

Manufacturers order the hangers through the online store and once received, place their garments onto the hangers (GOH). The GOHs are then sent to retail stores around the world, ready to be presented on shop floors. Once the garments are sold to customers, the retailer retains the hangers ready to be collected by Pact. Returned hangers undergo quality inspection before being reused.

Shipping the garments on hangers reduces the cost and time it takes for retailers to present garments in store. By re-using their hangers, it is estimated that 64 per cent of carbon emissions and 86 per cent of water consumption are saved, compared to the process of manufacturing of new hangers. Furthermore, this diverts more than a million used hangers from landfill a day.[161]

Kegstar (Australia, UK & Ireland, USA, New Zealand and the Netherlands)

An asset pooling business, specialising in smart technology-enabled one-way stainless-steel kegs and casks.

Under its pooling model, Kegstar owns and manages a growing pool of over 300,000 kegs, each uniquely identified and tracked as the keg moves through the supply chain, on Kegstar's proprietary cloud-based software. The system follows a five-step process:

1. The customer can plan, order, track and control the cost of the kegs through Mystar, the Kegstar app.

2. Empty kegs are delivered as per the need and the billing begins.

3. The customer delivers the full kegs to the desired wholesaler or venue.

4. At the point of delivery, the customer scans each full keg in its new location with the Kegstar app.

5. Once used, venues scan the empty kegs for collection via the Kegstar app, returning them to the system to be pooled and reused.

The Kegstar leasing model provides customers with custom branded silk-screened kegs. Custom branding allows businesses renting the kegs to increase brand recognition, reduce lost kegs and improve efficiency of distribution partners.[162]

Business to Business – Multi-industry pooling

CHEP: A Multi-industry partnership (Australia)

A global leader in sustainable packaging solutions, implementing circular economy principles within its 'Share and Reuse' business model. By sharing and reusing pooled equipment, CHEP's customers can meet their cost and sustainability goals, collaborate with other supply chain participants and collectively deliver a more significant environmental impact.[163]

CHEP's platforms replace single-use packaging with high quality, reusable platforms, including pallets, Reusable Plastic Containers (RPCs) and containers. These platforms are recovered, repaired or reconditioned, and redistributed many times over their useful life. Each use of a CHEP solution removes the need for one-way alternatives, eliminates waste and reduces carbon emissions while also significantly reducing packaging material costs. Reusing pallets also promotes certified renewable forestry materials.

Examples of CHEPs' customers who deliver their products seamlessly throughout Australia, leveraging a network of service centres coupled with leading logistics capabilities, include:

- Limit Farms worked together with CHEP to reduce the cost to serve and achieve more efficient, profitable and sustainable product loads from farm to supermarket produce shelves. The combination of CHEP pallets, Foldable Bins and RPCs support Limit Farms, their processors and retailers with clean, fresh quality produce throughout the supply chain.[164]

- Beta Spuds and Valle Verde Orchard use a combination of CHEP pallets, bins and crates to supply directly into supermarkets. Packing fresh produce directly into CHEP bins saves time for the growers and protects the integrity of the produce until it reaches the consumer.[165]

- Tru Blu Beverages, the third largest non-alcoholic and non-dairy beverage manufacturer in Australia, partnered with CHEP to identify, trial and implement a series of sustainable solutions including a reusable Retail Display Pallet and Beverage Tray system, which allows the same packaging to be used for transportation, replenishment, retail merchandising displays and storage of products – enabling efficient product movement from manufacturing to shop floor, while streamlining merchandising and replenishment processes.[166,167]

Business to Business – Physical internet

Euro Pool Group (Europe)

A rent and return system of reusable foldable trays available to suppliers of fresh and packaged foods in Europe.

Euro Pool Group is a logistics service provider of reusable packaging operating in 29 countries in Europe. Euro Pool Group consists of two branches: Euro Pool System (EPS) and La Palette Rouge (LPR).

The EPS standard packaging characteristics make it possible to automate logistics processes and the foldable trays increase efficiency as they take up 86 per cent less volume on return trips.

The trays are thoroughly cleaned after each rotation and have an average lifespan of seven years. EPS offers customers three types of pooling services based on their rent and return model, providing customers with a tailored logistics service and reusable packaging.

LPR provides reusable pallets and logistic services in the European fast-moving consumer goods and retail sectors. The pallet pooling services offer customers a fully outsourced solution with pallets that are entirely compatible with automated production and picking systems. Through the MyLPR website, customers order pallets to be delivered to their production site and arrange for their collection. Returned pallets are checked, sorted and repaired before each use. The pallets have a lifespan of at least five years and are recycled at their end of life.

In 2019, the Group recorded 1,161 million tray movements and 95 million pallet movements in Europe, with a net turnover of EUR621 million.[168]

Business to Business – Individual adoption

John Deere (Global)

An integrated tracking system to effectively manage reverse logistics in a global supply chain, where each container is tagged and tracked via an internet-based system 24 hours a day.

John Deere is a leading manufacturer of farm, construction and forestry equipment operating across the US, Russia, China, India and Brazil. Deere is one of the top 30 manufacturing companies (by tonnage) of global imports and exports.

John Deere owns over 1.5 million reusable shipping containers, and the tracking system maintains the viability of the reusable container program by ensuring they stay within the supply chain for ongoing reuse.

The value of the container and the nature of its route determine the type of tracking tag used. High-cost containers in multi-stop, long-distance loops utilise active RFID, featuring automated verification of arrival and periodic monitoring of dwell in each location. Passive RFID is deployed on containers that flow through a central location such as a distribution centre. Manual scanning of bar codes is also used for small inexpensive totes.

The company has experienced significant cost savings by using reusable transport / distribution packaging, 85 per cent of which is attributed to the avoided expense of expendable packaging. Other significant savings result from reduced cost of waste disposal and improved transportation density: seven percent of their total savings can be attributed to greater payload of material in transit.[169]

Glossary

Business-to-business packaging

Packaging used for the containment, protection or handling of product where the end-customer, prior to the packaging reaching end-of-life, is a business or institution. Typically includes the secondary and tertiary packaging that is used to move products between businesses prior to sale to end-consumers but can also include primary packaging if the business is the end-user. Same meaning as 'Commercial packaging'.

Also see 'Packaging' and 'Business-to-consumer (B2C) packaging'.

Business-to-consumer packaging

Packaging used for the containment, protection, marketing or handling of product where the end-customer, prior to the packaging reaching end-of life, is a consumer (i.e., a person). Includes the primary packaging that is sold to end-consumer, and possibly some secondary packaging, but excludes any B2B packaging that is part of the packaging system. Same meaning as 'Consumer packaging'. Also see 'Packaging' and 'Business-to-business (B2B) packaging'.

Circular economy

The circular economy concept is a systems approach to material/energy flows that extends significantly on the 'waste hierarchy', with the objective being to decouple economic growth/development from the use of non-renewable resources (including energy). It is a concept that extends to cover the entire life cycle of products and services, including design. It assumes that the current approach of incremental and fractured improvements in materials and energy efficiency are not sufficient to achieve the potential (much larger) economic and environmental gains that are available.

Consumer packaging

Consumer packaging is defined in the National Environment Protection (Used Packaging Materials) Measure 2011 to mean all packaging products made of any material, or combination of materials, for the containment, protection, marketing or handling of consumer products. This also includes distribution packaging. For clarity, consumer packaging includes:
- Primary packaging – materials directly containing the product.
- Secondary packaging – materials used to contain single or multiple primary packed products; and
- Tertiary packaging – materials used to distribute packaged and unpackaged products.

End-user

The individual or entity who uses a particular product.

Life cycle assessment (LCA)

Technique used to assess the environmental impacts associated with all the stages of a product's life from raw material extraction through materials processing, manufacture, distribution, use, repair and maintenance, and disposal or recycling. The goal of LCA is to compare a range of environmental effects assignable to products and services (in this case packaging) by quantifying all inputs and outputs of material flows and assessing how these material flows affect the environment. This information is used to improve processes, support policy and provide a sound basis for informed decisions.

Material efficiency

Aims to optimise the quantity of packaging used for a product. This is achieved for example by reducing the weight or volume of the package.

Physical internet

A business-to-business reuse model based on the following 3 key principles drawing inspiration from the digital Internet to create a Physical Internet using a logistics system based on standardised, modularised and reusable containers, using open networks across industries with pooled assets and protocols:
- Reuse - Standardised, modular, reusable, recyclable containers;
- Share - Open networks with pooled assets and protocols; and
- Virtualise - IT infrastructure that allows real-time tracking.

Recoverability

Recoverability of packaging refers to the availability of systems for reuse, recycling, composting or energy recovery.

Recyclable

A packaging (1) or packaging component (2,3) is recyclable if its successful post-consumer (4) collection, sorting, and recycling (5) is proven to work in practice and at scale.

Notes

1. A package can be considered recyclable if its main packaging components are recyclable according to the above definition and if the remaining minor components are compatible with the recycling process and do not hinder the recyclability of the main components. The PREP design tool provides information on recyclability of packaging through kerbside collection services.

2. A packaging component is a part of packaging that can be separated by hand or by using simple physical means (ISO 18601), e.g. a cap, a lid and (non in-mould) labels.

3. A packaging component can only be considered recyclable if that entire component, excluding minor incidental constituents (6), is recyclable according to the definition above. If just one material of a multi-material component is recyclable, one can only claim recyclability of that material, not of the component as a whole (in line with ISO 14021).

4. ISO 14021 defines post-consumer material as material generated by households or by commercial, industrial and institutional facilities in their role as end users of the product which can no longer be used for its intended purpose. This includes returns of material from the distribution chain. It excludes pre-consumer material (e.g. production scrap).

ISO 18601:2013: A packaging constituent is a part from which packaging or its components are made, and which cannot be separated by hand or by using simple physical means (e.g. a layer of a multi-layered pack or an in-mould label).

Reuse

An operation by which packaging is refilled or used for the same purpose for which it was conceived, with or without the support of auxiliary products present on the market, enabling the packaging to be refilled.

Reuse cycle

A rotation undergone by reusable packaging from filling to filling.

Reuse rate

The number of times packaging accomplishes a reuse cycle for which it was conceived and designed within its life cycle, expressed as the number of cycles completed.

Reusable packaging

Packaging or packaging component which has been designed to accomplish or proves its ability to accomplish a minimum number of trips or rotations in a system for reuse.

Single use

Packaging that is likely to be designed to be discarded after a single use and is routinely disposed of after its contents have been unpacked or exhausted.

Trip

A trip is defined as transfer of packaging, from filling to emptying.

Waste hierarchy

An order for preference for the management of waste, with avoidance being the most preferred option and disposal to landfill being the least.

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