Emerging Market Trends in Operational Waste Management & Circular Economy

October 2022

EDGE

Operational Waste and the Circular Economy

5 mins	Principles of a Circular Economy Waste as a material
5 mins	Operational waste management plans and design guidelines Circular Economy plans
10 mins	Emerging circular market trends in the commercial office space Case study: Furniture product stewardship
5 mins	Current and emerging market drivers - Reporting - Data and transparency
5 mins	Recap and recommendations

Our services

Circular Economy & Lifecycle Thinking

(CELT)

Circular economy

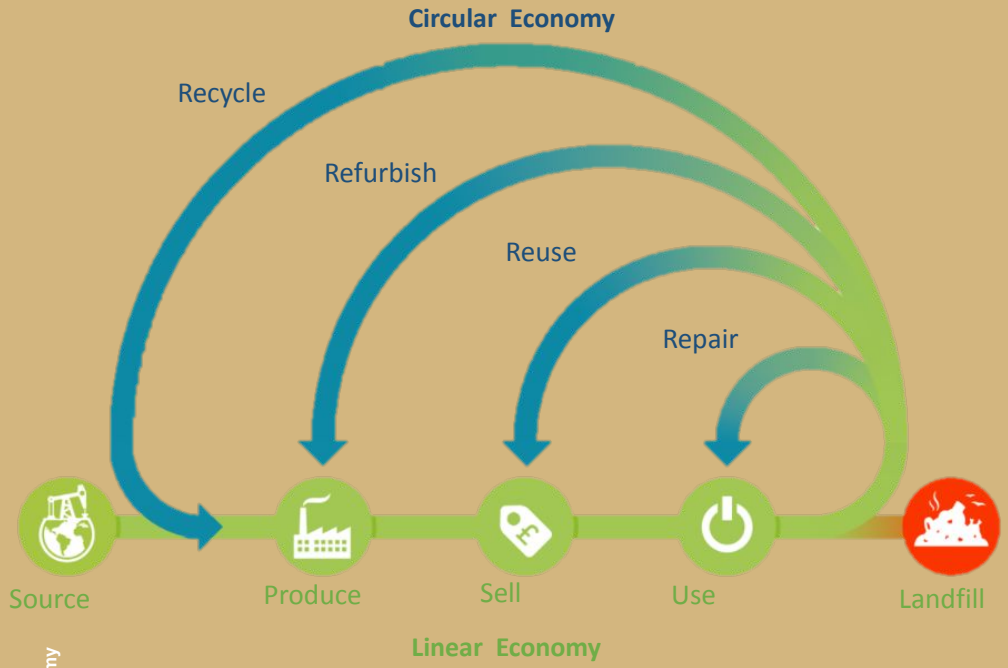
- Circular economy policy and research
- Circular economy strategy
- Circular product and service design
- Material flow analysis and circularity assessments
- Training and facilitation

Lifecycle thinking

- Life cycle assessment (LCA)
- Environment Product Declarations (EPDs)
- Hotspot analysis and benchmarking
- Whole of life cost/triple bottom line assessment

Waste and resource recovery

- Resource recovery strategy
- Waste audit programme design and delivery
- Operational and construction waste management plans

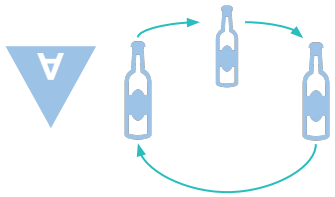


Principles of a Circular Economy – Waste as a Material Resource

- A CE encourages the elimination of ‘waste’ through the superior design of products, services, and business models.
- The aim is to extract the **maximum value and minimize the environmental impact from any materials and resources in use.**
- The CE involves **reusing, repairing, refurbishing, remanufacturing and recycling** of existing products or materials at the end their useful life cycle to recover the embedded energy and materials.

Material Grades and Flows

A-Grade – Can be recycled over and over again



Closed Loop

Glass, aluminum, metals

B-Grade – Downcycled to a different product each time it is recycled

Downcycled

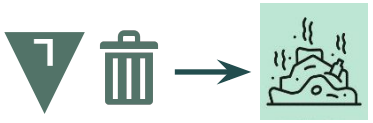
Cardboard, paper, plastics

C-Grade – Products that have a one-off re-use

One off re-use

Paper towels, some plastics

Landfill – This is non-recovered waste



Landfill

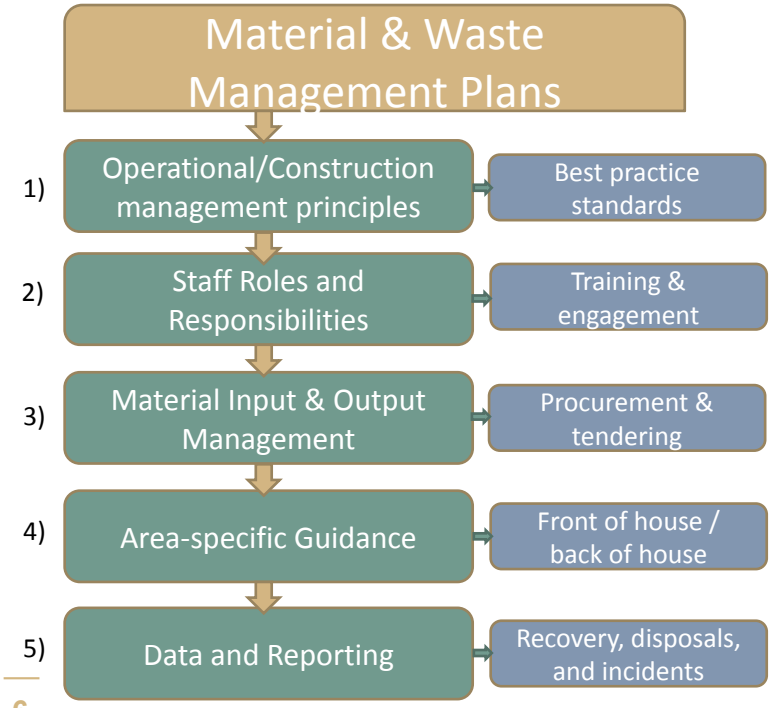
Residual waste

The GPT Group

GPT Waste - Taking the Rubbish out of Recycling Data

Waste Management Plans – Construction & Operation

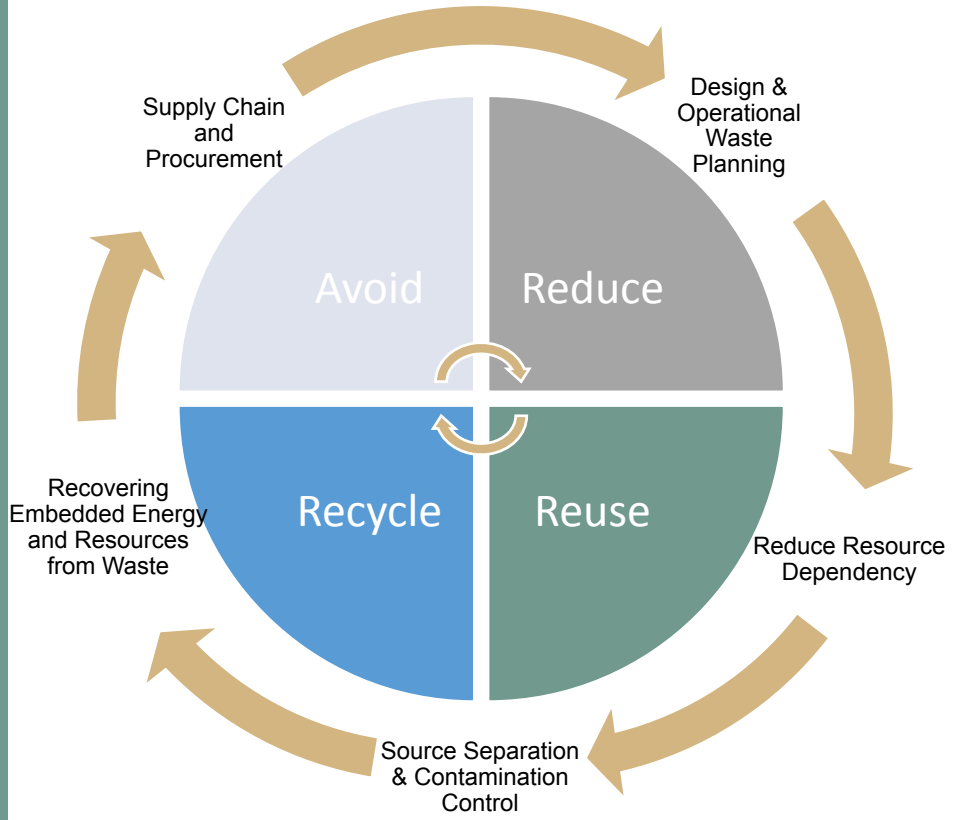
Waste management plans outline the principles and guidelines for addressing the core facets of waste and material flows, through a buildings design and to its operation.



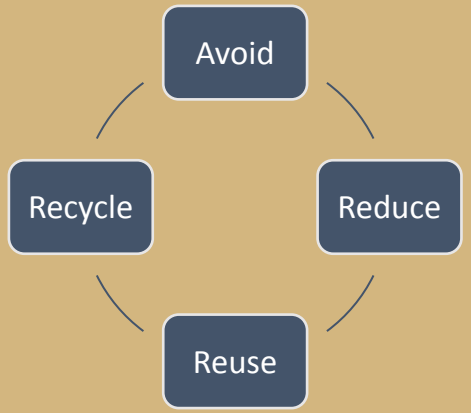
A Need To Go Beyond WMP's – Circular Economy Plans

How can you go beyond WMP's and drive avoidance and design out unnecessary materials from the procurement phase to the operation and use?

- Circular Procurement
- Building design and planning
- Prioritise reuse and avoid unnecessary waste
- Are all streams available (construction & operation)?
- Procure service providers with due diligence
- Viewing the building through a lens of material flows, and how you can intervene.
- Strip-out policies and plans



Current and emerging market trends and opportunities in the Circular Economy



Avoid and Reduce

Market trends

Green Leasing

Barangaroo & QQT – Tenants sign up to sustainable requirements for operation

- Expanding this to include avoidance

Circular Procurement and Policies

Brookfield's 'Breaking the Plastic Habit' – Banning single-use across the portfolio and prioritizing materials that will avoid unnecessary waste.

- Material and procurement analysis and intervention, ongoing reporting

Behaviour Change & Education

Encouraging positive change and instilling an office culture that is aware of environmental issues and what they can do.

- ABACUS Property
- Online modules and induction packages

Reuse

Market trends

Coffee Cups – a gateway to a broader issue

Coffee cups have been a topical issue for a long time, but for good reason.

- Embodied energy
- A lens to view the linear economy
- Compostable packaging alternatives– are they viable with current infrastructure?

Fit-out and De-Fit Phase – Intervention & Policy

Previous work by Edge for the BBP estimated 115,000 tonnes of refurb office waste is landfilled each year. In some cases, less than 5% of commercial office furniture is currently diverted.

- Follow BBP Strip-out guidelines
- **Emerging product stewardship schemes**
- Look for existing circular furniture models and take-back schemes

Operational – Closed Loop Food Courts

Emerging trials of closed loop food courts – Monash University in Melbourne

- All containers available as Reusable alternatives
- Drop off locations throughout campus to capture and wash used containers

Case Study: Commercial Office Furniture

Edge's analysis indicated that waste from refurbishment –generated at a rate of ~62t/1000m2 during tenancy strip out –is likely to be greater than total operational waste over a building's 50-80 year lifetime.

Key Takeaway:

Fit-outs are not forever, the average tenancy is 5.3 years.

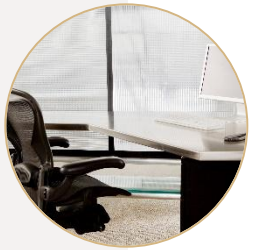
By opting to manage stripout furniture waste, you can benefit **economically, socially, and environmentally.**

Setup a Fit-out and Strip-out Policy

These policies can include diversion targets, opportunities for reuse, and other expected clauses that the contractors should abide by. **The Better Building Partnership (BBP)** also offer excellent guidance on clauses that can be used and adapted to suit your needs.

Sustainable & Circular Procurement

Products under the GECA certifications (furniture) are considered **Green Star Applicable.**

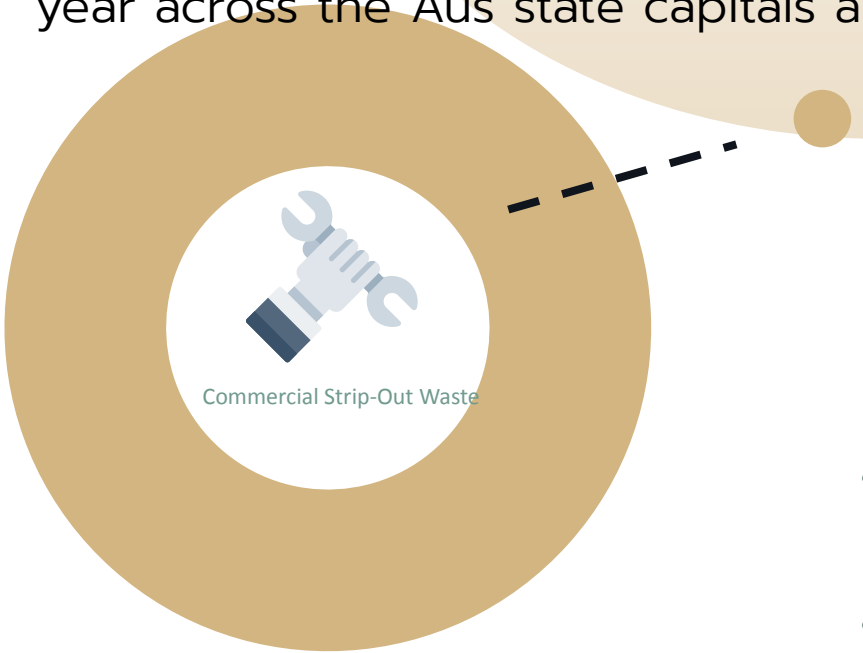


Prioritise Reuse

Following a setup strip-out policy, there should be emphasis on reuse and redistribution of furniture. There are several charitable organisations that focus on furniture products. Contact the furniture provider for advise on how to reuse the existing furniture.

Scope and Size of the Problem

3 million m2 of commercial office space is turned over each year across the Aus state capitals alone.

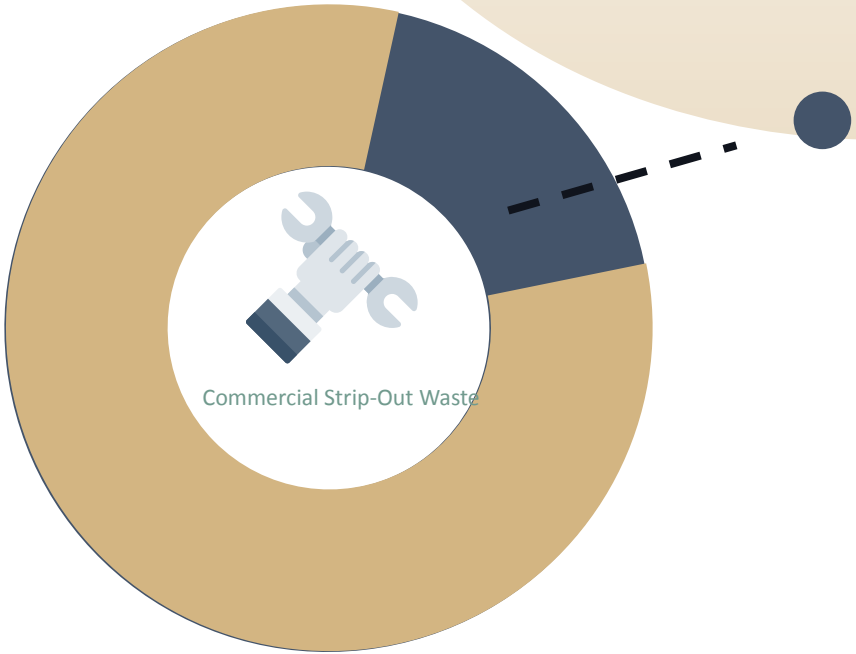


~115,000 tonnes/year

of refurbishment waste (including construction and demolition waste such as plasterboard, appliances, glazing, carpets, etc.)

- Currently, in strip-out projects achieve recovery rates between 25%-60%, and in best case up to 80%
- Loose furniture typically makes up the remaining 20% of all strip-out materials and recognised as one of the most difficult and expensive to recover.

Scope and Size of the Problem



~35,000

tonnes/year of loose

furniture, (primarily made up on office chairs, workstations and storage units)

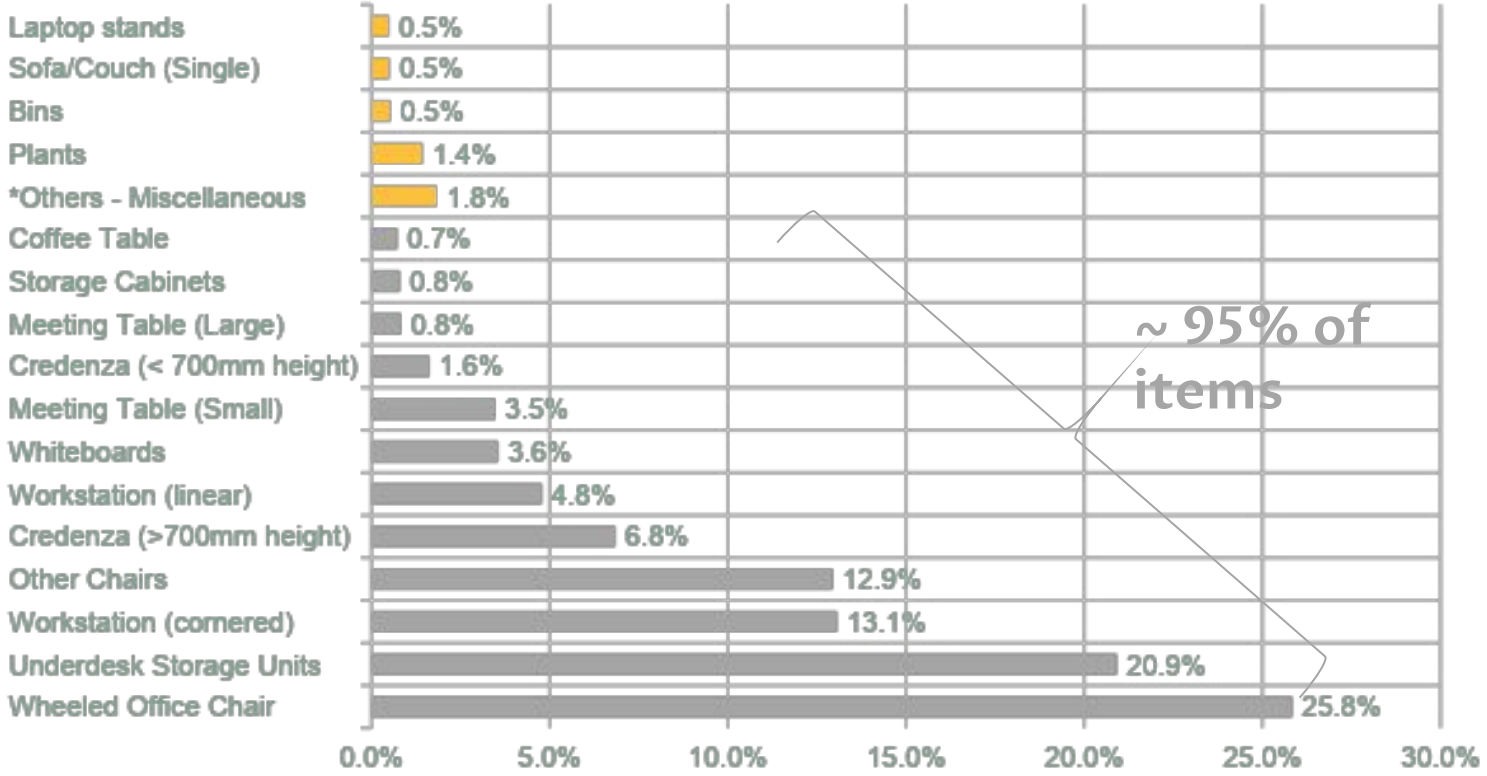
Commercial Office Furniture disposed of in Australia
[source: BBP reporting 2018-2021, Savill's 2021 Q1 national office report]

Informing a scope – What makes up Commercial Furniture?

Out of Scope

In Scope

Proportion of number of items



Based on inventory of:
> 13 Sydney fitouts
> 37,000 items

Why the need for stewardship?

Interiors Tool – Provisions for end of life

greenstar

Building Fit Out

"Make Good" Clause Signed

Average tenancy 5.3 years

Lease ends

End-of-life decision making point

Strip Out

Contractor Appointed

Good practice might be 60% recovery.

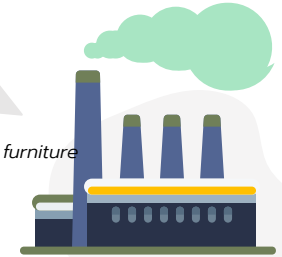
Time pressure

Dissasemble, & Dismantle

Once strip-out commences, time is precious.

~95% of commercial furniture waste

Furniture Recovery Ecosystem



Disposed to Landfill

greenstar

Criteria 4.2 – 1 Point reducing demolition waste

Recycle

Market Trends

Procurement

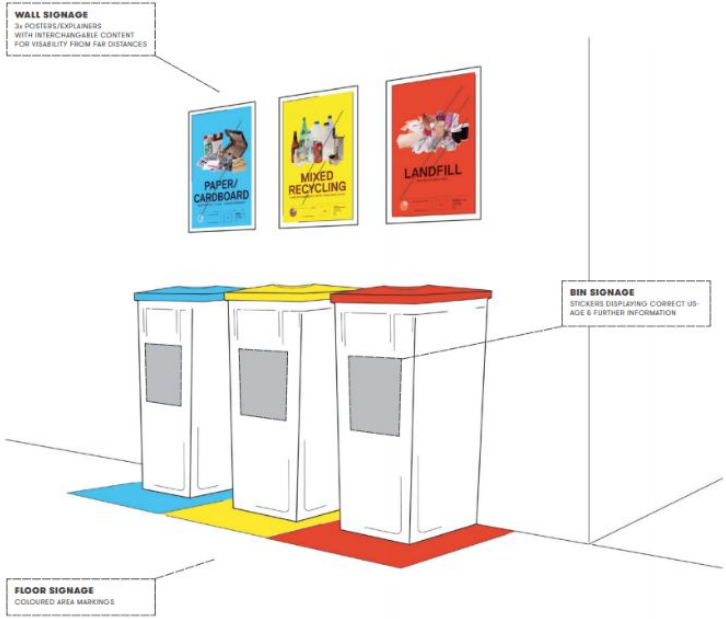
- Prioritise A and B grade materials in your procurement decisions

Waste Stream Provision:

- More provision of clean/separated streams that are sent to decentralised recycling facilities.
- Cleaner roles and responsibilities

Dock and Operational Design:

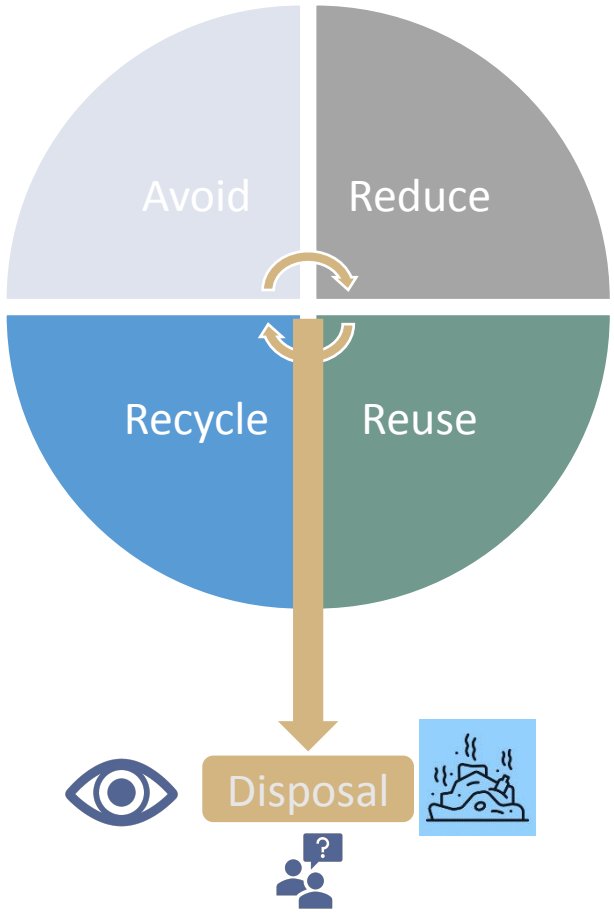
- Intelligent dock design
- Signage – colour coding
- Considers behaviours
- Interactive technology



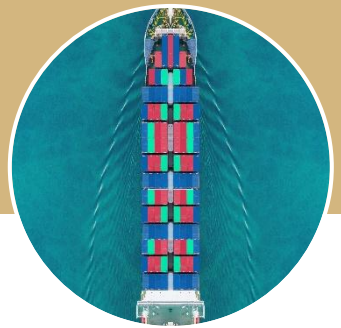
Disposal

Recognise and acknowledge items that you see commonly disposed and ask:

- Who are we buying this from, and how can we improve?
- Is there a reusable alternative?
- Is there opportunity for product stewardship/partnerships to recover these materials?
- Could have this been avoided entirely?
- Are we tracking everything that is leaving our building?



Designing and Procuring for Circularity and Recovery



1. Supply Chain

Improve sustainable supply chains and procurement to **design out** waste in the first place

The importance of this cannot be emphasised enough (waste minimisation, emissions reductions etc.)

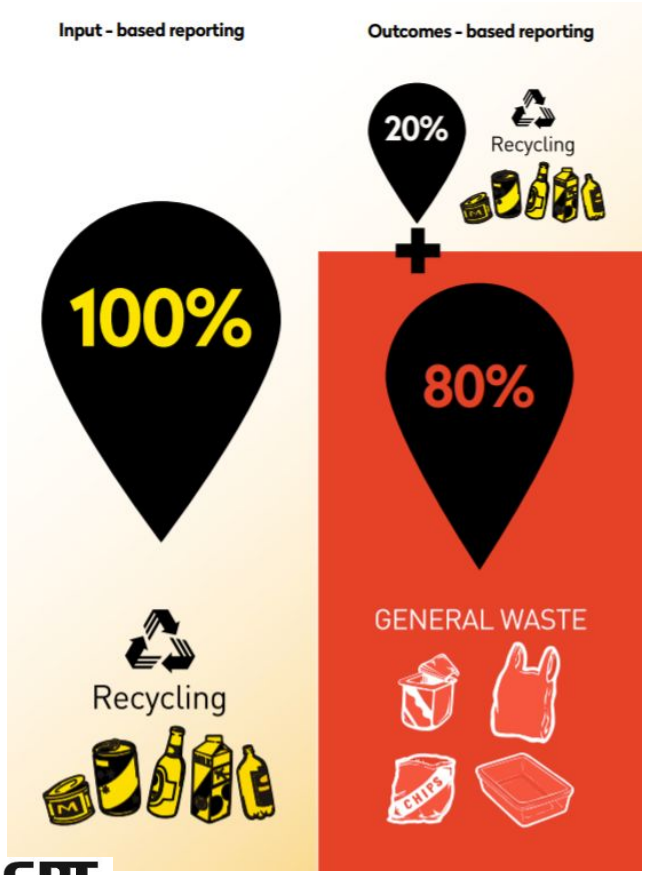
2. Service Design

Design and offer better products and services that minimise the generation of materials and waste and promote reuse

3. Resource Efficiency

Embed and implement best practice material recovery and recycling practices to ensure that necessary waste by-products are captured for recycling or re-use

Current and emerging market drivers



GPT Waste - Taking the Rubbish out of Recycling Data

Reporting

We are seeing requirements and demand for more detailed waste reporting across the industry.

- Inputs Vs. Outcomes based reporting
- Material Recovery Statements (NABERS)
- Innovative waste data contractors (BinTracker)

Case Study – Recycled Vs. Composted

- Considerations for compostable packaging – where is it viable and is it better than single use plastics?
- Research has shown that compostable products provide negligible or no nutrient value to compost.
- NSW EPA Guidance on compostable packaging in FOGO
- Upcoming Australian state-based legislation – Single-use plastic bans and PLA. Toxic elements found within certain packaging types.

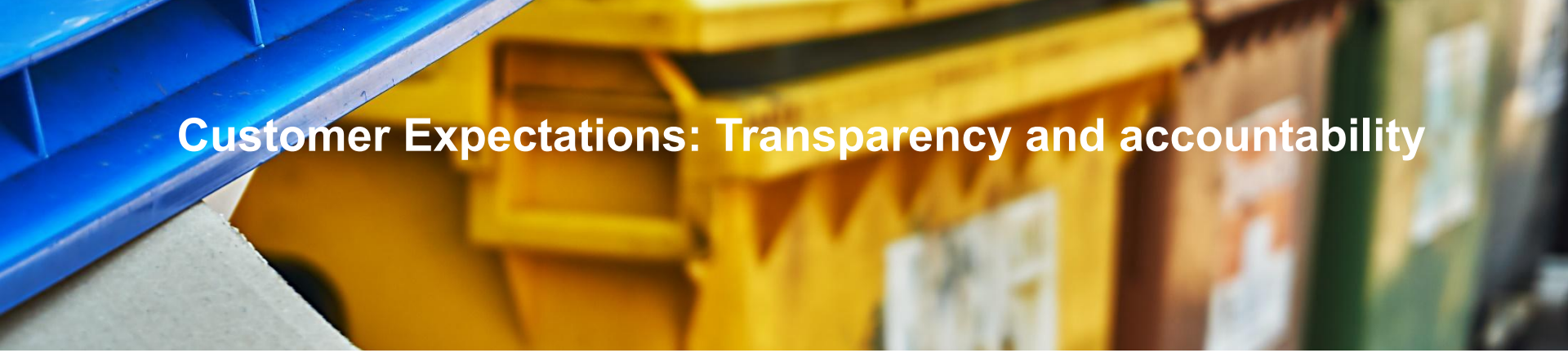
Compostable
AS 4736
ABAX 9999

Home Compostable
AS 5810
ABAX 9999

Industrial

Home

> “Emerging research shows that the impact of increasing compostable plastic content in compost (other than kitchen caddy liners that comply with Australian Standard AS 4736-2006) may impact its safe application to land.”



Customer Expectations: Transparency and accountability

Transparency is the next phase of waste and material management. Understanding what you are procuring, how you and your tenants are disposing of it, and what happens to it at it's end of life are the next focal points of market transformation.

We are seeing this across existing rating tools and emerging technologies:

- GBCA
- NZGBC
- ISCA
- NABERS
- GECA Certifications

Quality Data

Quality data underpins benchmarking and improvement opportunities for all aspects of waste and material management.

- Benchmarking
- Target setting
- Contamination reporting & identification
- Measuring avoidance and creating inventories – Strip-outs
- Feedback to tenants/occupants for improvement leverage

Recap and Recommendations

Consider the Hierarchy

Can you avoid waste from being generated in the first place?

Capitalise on sustainable and circular procurement

Support businesses with sustainable products and practices – prioritise reusable and recyclable products that can re-enter the value chain at end-of-life

Service Design

Best practice waste management starts with intelligent service design and operations that minimise waste generation and maximise material recovery

Market Drivers – Data and Reporting

Capitalise on granular data and reporting to benchmark current practices, set targets to improve, and gain actionable insights along the way.

Contact

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