2025 AUSTRALIA'S WASTE[D] OPPORTUNITY

A tools-down moment for Aussie leaders tackling productivity, costs, and climate.

Green Building Council Australia
cefc
NSW GOVERNMENT
Coreo

We acknowledge the first and continuing custodians of this country, the ground upon which we collectively work, create, live and dream.

We recognise the Aboriginal and Torres Strait Islander peoples continuing connection to lands, waters and communities and pay our respect to Aboriginal and Torres Strait Islander cultures, and to Elders past, present and future.

The benchmarking project was led by Coreo as circular economy specialists, and developed in partnership with Green Building Council of Australia (GBCA) and industry partners who contributed data and supported the direction and development of the report. The Clean Energy Finance Corporation (CEFC) served as a funding partner, while the Bradfield Development Authority contributed funding and played a pivotal role in catalysing the project through their industry leadership to establish benchmark-based targets.

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AUSTRALIA'S WASTE[D] OPPORTUNITY

EXECUTIVE SUMMARY

Australia's construction industry generates 29 million tonnes of waste[d] material annually

39% OF THE NATION'S TOTAL, MORE THAN ANY OTHER SECTOR.

Our analysis of 142 construction projects reveals it's not 'waste', **but it is a waste of your money!**

WHY SHOULD YOU CARE?

Let's crunch the numbers for a new Brisbane apartment

$1,740 PER METRE^2 MATERIAL COST × **22%** WASTED PER METRE^2 × **137 m^2** AVERAGE APARTMENT SIZE

Want to see how we did the maths? Click here.

~$384*per m^2 spent on wasted materials

141 kgs wasted for every 1 m^2** WE BUILD

IF WE SCALE THIS UP

UP TO $64 BILLION* over the next 5 years

It is projected that **68%** of all Australians will live in a capital city by 2032. So if we scale this up to the National Cabinet target for **1.2 million** new homes built by 2029 to address Australia's housing crisis, that's up to **$64 billion*** taken right out of Australian pockets over the next 5 years.

$64 billion* for materials we're not even using? That's rubbish!

To dig us out of this hole, and build a different future, the goal of this report is to establish national benchmarks for construction and fitout projects across various typologies to bring down costs, boost material productivity and support long-term reductions in embodied carbon within buildings that advance the sector's decarbonisation pathway.

ON AV. **$52,564** per apartment* spent on material that gets wasted

* On the higher end of estimates, see Appendix A for range and calculations.
** What do we mean when we say 'wasted materials'? This refers to total materials that were not utilised on a construction or fitout site, meaning they were sent to landfill, a Waste-to-energy facility or *collected* for recycling.

NOW, YOU MIGHT BE THINKING . . .

At least it all gets recycled!

BUT THAT'S NOT THE FULL STORY...

While 83% of projects analysed claim landfill diversion rates over 90%, our analysis found that this isn't the full story.

Diversion rates don't tell us how much material and value is lost along the way even when we do recycle, with some material recovery rates as low as **14%.**

THE REALITY?

We have evidence of what's *collected* for recycling but verifiable evidence of what *is* recycled is scarce

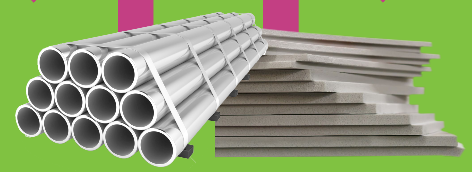
WHAT'S MORE IMPORTANT THAN REPORTING GENERIC DIVERSION PERCENTAGES?

90% of waste diverted from landfill

DIVERSION APPROACH

VS

DIRECTIONAL APPROACH EXAMPLE



100t of steel reused in a new build Reducing cost by 74%

300t of plasterboard to soil regeneration Saving 15.5t of carbon

INCREASING CIRCULARITY THROUGH REUSING MATERIALS IS EXTREMELY IMPORTANT

Australia is only 4.6% circular

Meaning 95.4% of what we consume today is a virgin resource.

With Australia holding the third-highest material footprint per capita in the OECD, each percentage point improvement in circularity represents billions in potential economic productivity.

And yes it's possible, the Netherlands are committed to achieve a circular economy by 2050, their national circularity rate is 24.5% and their construction industry has already achieved a rate of 8%. Which if you didn't know, an 8% circularity rate is Australia's new National Circularity target for achievement by 2030.

So how do we stop wasting away?

Well, every actor across the construction industry value chain is implicated in the findings of this report, from architects to trades, to 'waste' contractors, everyone's hands carry the weight of 'waste'.

As an industry we need to work together to identify and implement opportunities to reduce waste[d] resources. And we've got the resources to help us get there!

BENCHMARKS IN A BLINK

Recycled Material Categories	New Building Construction Benchmarks (kg/m²)			New Fitout Construction Benchmarks (kg/m²)		
	Mixed Use Construction (kg/m²)	Commercial Construction (kg/m²)	Mixed Use & Commercial Construction Combined (kg/m²)	Commercial Fitout Benchmark (kg/m²)	Retail Fitout Benchmark (kg/m²)	Commercial & Retail Fitout Combined (kg/m²)
Bricks/ tiles	3.7	10.6	7.7	4.8	3.8	6.6
Concrete	28.9	56.8	44.6	11.4	6.1	10.6
Mixed Concrete, Masonry and Tile	157.3	41	118.6	10.4	17.1	11.5
Asphalt	1.9	3.3	2.8	0	0	0.0
Soil / Sand / Rubble Fines	6.5	57.6	37.5	2.7	0	2.4
Ferrous Metals	7.2	6.7	6.9	2.4	10.4	3.5
Non-Ferrous Metals	0.9	1.1	1	0.7	0.8	0.7
MIxed Metals	20.9	13.3	17.5	6	8.9	6.4
Timber	22.2	17.6	19.9	8.3	8.7	8.4
Chipboard & Form Ply	0	3.7	3.6	0	0	0.0
Green Waste	1.4	1.1	1.3	0	0	0.0
Cardboard / Paper	5.3	3.1	4.2	2	4.5	2.2
Plastic	4	3	3.4	1.2	4.9	1.7
Polystyrene	0.1	0.1	0.1	0.2	0	0.2
Plasterboard / Gyprock	5.3	3.9	4.7	4.5	9.5	5.2
Commingled Recycling	16.6	8.12	11.7	6.2	14.2	7.2
Glass	0.2	1.1	0.8	5.1	10.7	6.5
Insulation	0	0.2	0.2	0.2	0	0.2
Rubber	0	0.1	0.1	0	0	0.0
Carpet / Textiles	0	0	0	2	0	2.0
Lighting / E-waste	0	0	0	0.8	32.9	11.5
Total Collected for Recycling	150.8	121	136.6	31.8	47.4	34.6
Total Reuse	1	0	1	5.2	0	5.2
Total Landfill	6.8	5.5	6.2	2.5	3.1	2.6
Total Waste-to-energy (WTE)	25.9	31.9	30.4	1.1	0	1.1
Total Waste (Landfill, WTE, Recycling)	152.9	128.7	141.4	35.2	50.5	37.3
Diversion Percentage (%)	92%	88%	90%	91%	93%	91%
AVERAGE TOTAL WASTE[D] MATERIAL PER M²	141.4			37.9		
AVERAGE COST* OF WASTE[D] MATERIALS PER M²	$384			$105		

*See Appendix A for methodology.

Contribute your data and be part of shaping what's next - updated benchmarks are on the way!

TWO SETS OF BENCHMARKS

The benchmarks are built on material flow data from 142 primarily metropolitan construction and fitout projects from across Australia.

Benchmark set	Relevant asset typologies
New Building Construction 'waste'	Commercial, Mixed use
New Fitout Construction 'waste'	Commercial, Retail

What did we benchmark?

- Total Collected for Recycling (kg/m²)
- Total Reuse (kg/m²)
- Total Landfill (kg/m²)
- Total Waste to Energy (kg/m²)
- Total Wasted Materials (kg/m²) (Landfill, WTE, Recycling) and Average Total Waste (t)
- Landfill Diversion Percentage (%)
- Recycled Material Categories (kg/m²) (e.g., Timber)
- Average of Gross Floor Area (GFA) and Net Lettable Area (NLA) (m²)

Click **here** to go deeper into the calculation methodology.

INTRODUCTION

We plan to fill this gap each year by developing annual benchmarks that help drive momentum in material management across the construction industry.

Got data? We're all ears!

WHY THIS REPORT?

This report was developed in response to a significant gap in benchmarks for materials waste[d] during construction and fitout, as well as their post-use outcomes.

Coreo's initial efforts to benchmark the New South Wales Government Bradfield Development Authority (BDA) construction projects revealed that available data was insufficient to establish reliable, measurable benchmarks for performance - so Coreo expanded the benchmarking scope beyond BDA's to address Australia's construction industry and partnered with the Green Building Council of Australia to use anonymised Green Star data and redesign how industry thinks about "waste".

INTRODUCTION

Our goal..

To establish national benchmarks for construction and fitout projects to increase material productivity, bring down costs, and reduce climate impacts.

CONTEXT

The Australian construction industry, like all others, operates within the country's linear "take, make, waste" economic model.

WHEN WE 'MAKE' WE TEND TO MAKE 'WASTE'

Contributing a staggering 39% of the nation's total 'waste', our construction industry stands as Australia's single largest source of 'waste'*, exposing its outsized impact on the broader economy, society and environment.

Plus, the industry's upfront embodied carbon - driven by building material use and construction activity - makes up 7% of national emissions, highlighting the need for smarter material use and the integration of circular economy principles to support the built environment's decarbonisation transition.

On top of this, the Australian Government is beginning to address this waste[d] opportunity.

Enter the National Circular Economy Framework, which has listed the construction industry as a priority sector to contribute to increasing Australia's material productivity, lowering economic costs, and reducing climate impacts.

***WHY IS 'WASTE' IN QUOTATION MARKS?**

Quite simply, waste doesn't exist

It's a human construct. What we call 'waste' is actually valuable material that we've failed to value. These are resources - often virgin materials - we pay a premium for, discarded at great cost to our economy, climate, and nature.

We **TAKE** a lot!

WE TAKE
46 TONNES OF PRIMARY RESOURCES PER PERSON EACH YEAR

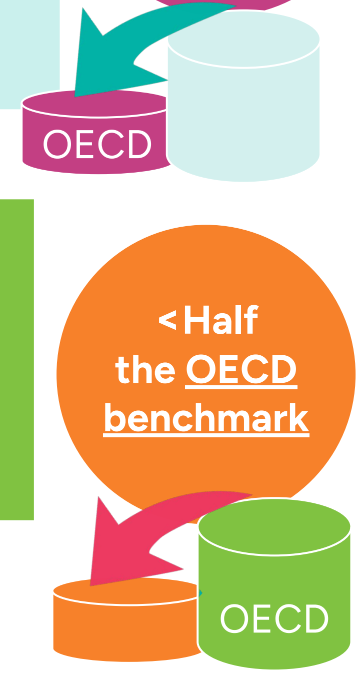
>Double the OECD benchmark

We don't **MAKE** a lot!

WE MAKE
$1.77 AUD GENERATED FOR EVERY TONNE OF MATERIAL CONSUMED

Low productivity rates

<Half the OECD benchmark



And we **WASTE** a lot!

WE WASTE
75.6 MILLION TONNES EVERY YEAR

This isn't about pointing fingers.

This is about recognising the enormous economic opportunity at hand.

A MATERIAL OPPORTUNITY

Across the Whole Value Chain

THERE ARE MANY STAKEHOLDERS INVOLVED AND ALL HAVE A JOB TO DO TO STOP MATERIALS BEING WASTE[D]

Materials are wasted at every stage of the value chain. Because information is not captured and shared along the chain, value is lost and there is no feedback loop to learn from mistakes. Forgoing the opportunity to improve material productivity, bring down costs, and reduce climate impacts.

METHODOLOGY

APPROACH

Building Strong Foundations

The benchmarks are built on data from 142 primarily metropolitan projects from across Australia. See the figure to the right for the breakdown on types of construction and fitout projects.

DATA SOURCES

The Nuts and Bolts

Stakeholder interviews and 'waste' collection data, primarily from Green Star submissions, were used to assess material flows, recovery rates, diversion, reuse, and recycling practices.

This analysis used information from 142 Green Star rated projects provided by the Green Building Council of Australia from the past 5 years. Green Star includes a 'Construction and Demolition Waste" credit in Green Star Design and As Built and and Green Star Interiors. The credit, requires 'waste' contractors and facilities to meet requirements to ensure they operate legally, have auditable systems, and undertake annual reporting of waste numbers. In addition, the credit requires that waste from construction and demolition waste is reduced by either:

- reducing the amount of waste generated and sent to landfill when compared to a typical building, or
- diverting a significant proportion of waste from going to landfill by recycling 90% of all waste.

73% of Green Star projects pursued the 90% diversion percentage benchmark, while 27% of Green Star projects pursued the landfill per square metre benchmark.

PROJECTS

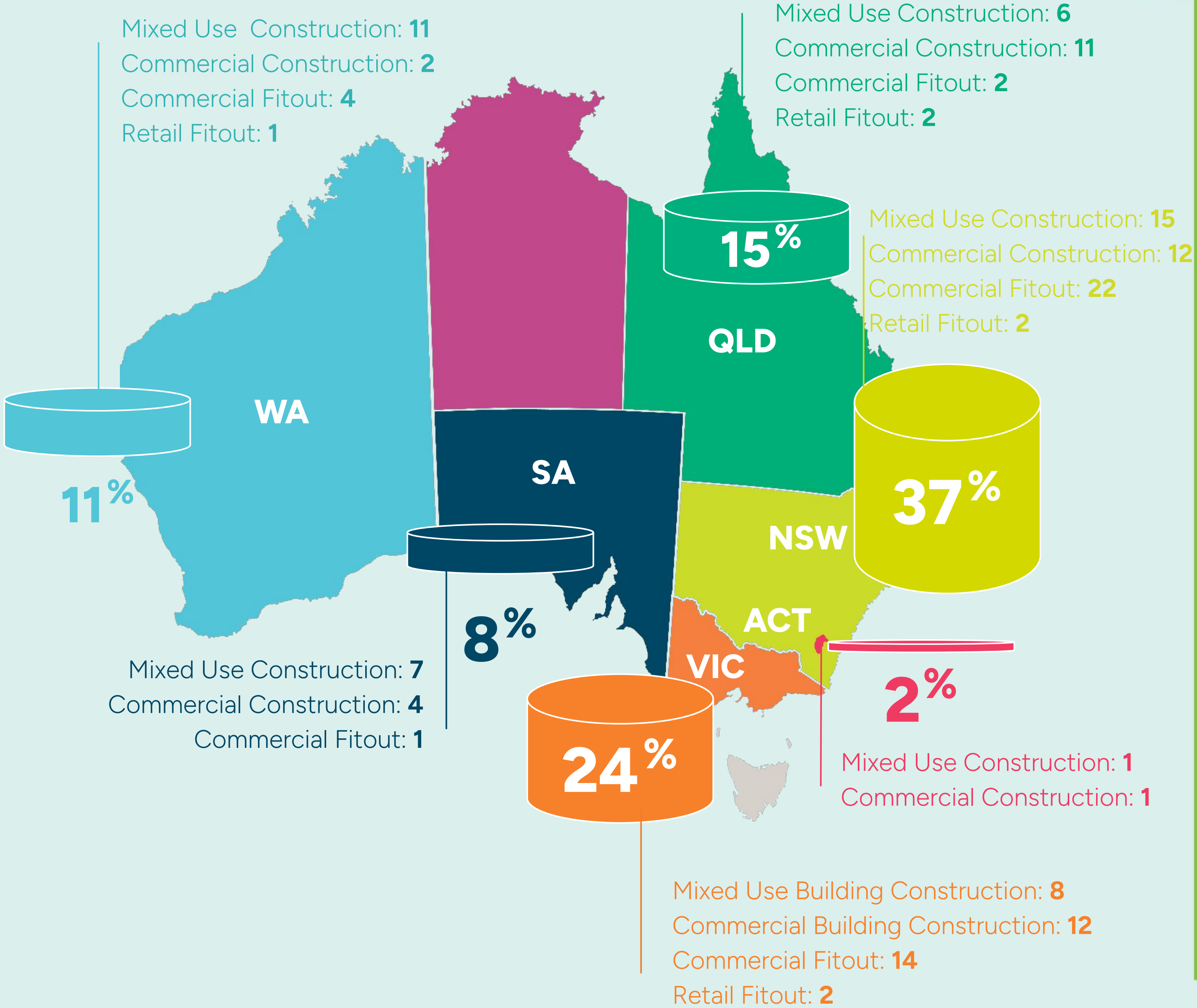
Project datasets reviewed ranged from commercial office buildings, new office refurbishment and retail fitouts, government buildings, retail and dining spaces, libraries and university campuses.

METHODOLOGY

DATA SOURCES

The Nuts and Bolts (cont)

The 142 projects spanned six Australian states and territories, primarily from major metropolitan areas as shown in the graphic below.



TWO SETS OF BENCHMARKS

Benchmark set	Relevant asset typologies
New Building Construction 'waste'	Commercial, Mixed use
New Fitout Construction 'waste'	Commercial, Retail

Why do we need different benchmarks for different construction categories?

Because they use different metrics! Construction projects measure materials in Gross Floor Area (GFA), while fitouts measure materials in Net Lettable Area (NLA).

What did we benchmark?

- Total Collected for Recycling (kg/m^2)
- Total Reuse (kg/m^2)
- Total Landfill (kg/m^2)
- Total Waste to Energy (kg/m^2)
- Total Wasted (kg/m sq) and Average Total Waste (t)
- Diversion Percentage (%)
- Recycled Material Categories (kg/m^2) (e.g., Timber)
- Average of Gross Floor Area (GFA) and Net Lettable Area (NLA) (m^2)

Click **here** to go deeper into the calculation methodology.

METHODOLOGY

Challenges

LIMITATIONS

Six key limitations were identified during this analysis

1 BIAS

The data set is skewed toward projects pursuing Green Star ratings. These projects often manage or report landfill diversion efforts in an attempt to achieve credit points, leading to a potential bias in the data.

2 STANDARDISATION

There are no standardised reporting templates, creating inconsistencies in reporting methods, metrics, and materials categories. This inconsistency made it difficult to compare data effectively across different projects.

3 INSUFFICIENT DATA

Fitout data was extremely limited across all typologies analysed, the data available predominantly focused on the 'de-fit' process of sites, rather than tracking the accurate flow of materials during fitout construction.

4 REPORTING BOUNDARIES

Reporting boundaries were not clear, between demolition and construction and construction and fitout 'waste' data. Where this was apparent, demolition materials were excluded from benchmarking.

5 CATEGORISATION

The categorisation of materials was often too broad to track outcomes, with many items simply labeled as 'commingled recycling'.

6 ACCURACY

'Waste' company practices were inconsistent in reporting recovered and recycled materials, with some using visual estimates, others providing per-load weighbridge data, and some relying on daily averages across multiple sites, introducing variability. Gaps in third-party auditing and potential inflated reporting by contractors seeking accreditation further undermined the reliability of recycling rate assessments.

Each identified challenge had an agreed-upon mitigation measure, to ensure the integrity of the analysis remained unaffected.

HOW MUCH IS BEING WASTE[D]?

THE BENCHMARKS

New Building Construction Benchmark: 141 kg/m² of GFA

~$384 per m²** spent on wasted materials

141 kgs wasted for every 1 m²

WE BUILD

**See Appendix A for methodology.

NEW BUILDING CONSTRUCTION

Including commercial and mixed use developments

Generated an average of **2,079 tonnes*** of waste[d] materials per site.

Average size **27,098m²**

Equivalent to the weight of 3.6 Airbus A380 planes! with waste[d] materials sent to recycling or landfill.

When broken down per square metre, that's 141 kg/m² roughly the weight of discarding a fully stocked refrigerator every square metre!

*Based on the total volume of wasted materials from recycling, landfill and WTE across all sites divided by the total number of sites assessed.

MIXED USE CONSTRUCTION PROJECTS

We analysed mixed use construction projects (think retail combined with restaurants, apartments and offices).

These generated an average of **2,279 tonnes*** of waste[d] materials per site.

Average size
31,317m²

That's the size of 20.7 fully loaded Mack trucks per site.

2,279 tonnes

~$419 ** **per m²** spent on wasted materials

Broken down per metre², that's **153 kg/m²**

roughly the weight of discarding a console piano for every square metre.

*Based on the total volume of wasted materials from recycling, landfill and WTE across all sites divided by the total number of sites assessed.

COMMERCIAL CONSTRUCTION PROJECTS

The analysed commercial construction projects (mostly offices)

Generated an average of **1,879 tonnes*** of waste[d] materials per site.

Average size
22,879m²

Equivalent to the weight of 4 Boeing 747-8 planes

1,879 tonnes

~$349 ** **per m²** spent on wasted materials**

Broken down per metre², that's **128 kg/m²**

roughly the weight of discarding a scooter for every square metre.

**See Appendix A for methodology.

WHAT MATERIALS ARE BEING WASTE [D] ?

92 commercial and mixed use new building construction projects revealed:

What we can tell you..

By weight, the top three categories being waste[d] are 'Mixed Concrete, Masonry and Tile', 'Soil, Sand and Rubble Fines,' and 'Timber.'

But, what we can't tell you...

What is actually waste[d] on each project due to no consistent material categories in reporting.

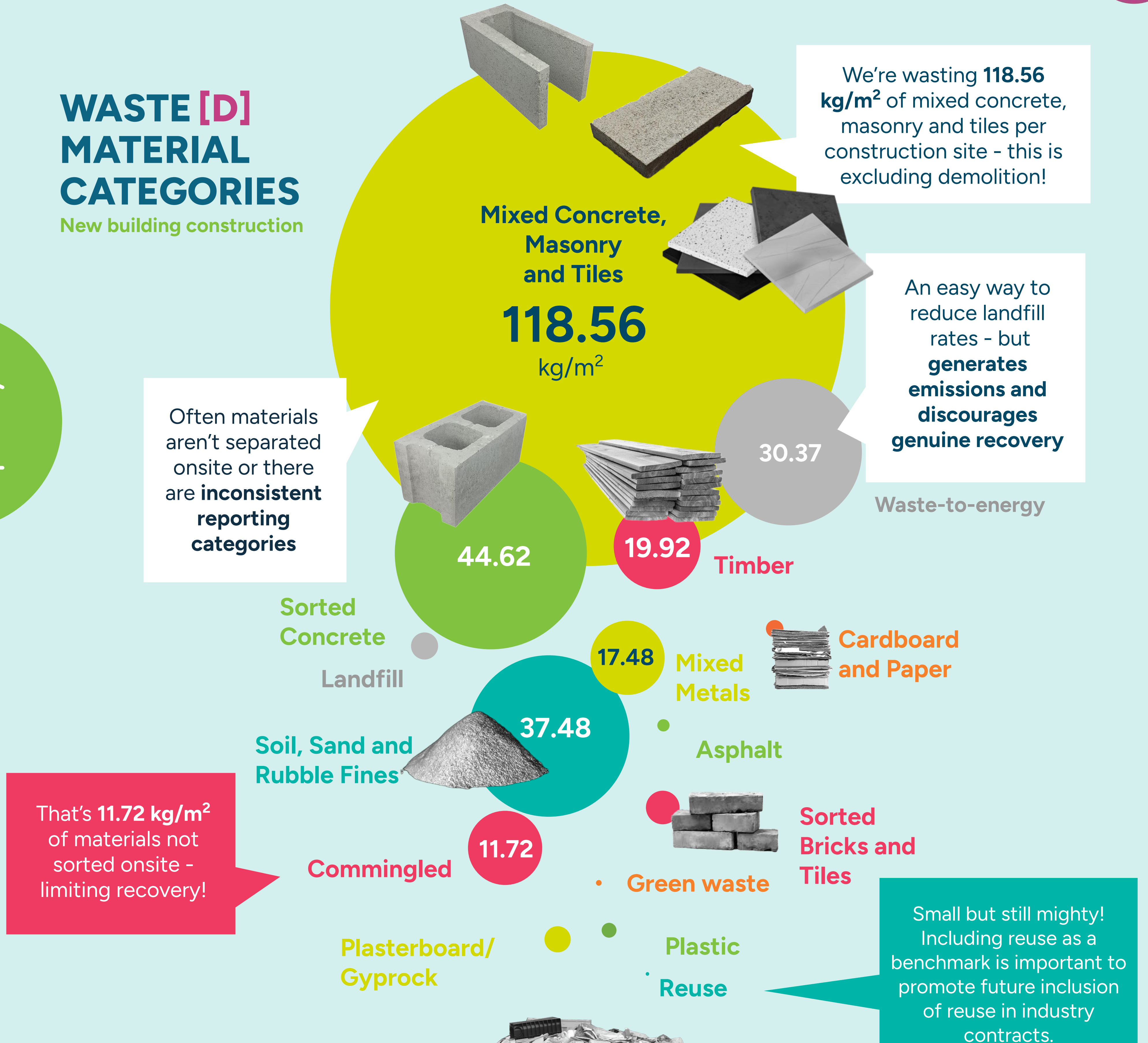
The condition or quality of materials, with the only pathways reported being recycling, waste-to-energy, and landfill.

What is in the "black box" of commingled recycling.

Long story short, we'd love to tell you what could have been reused, upcycled, or value-added - but with current industry reporting practices, we would be guessing!

WASTE [D] MATERIAL CATEGORIES

New building construction



*Reuse, glass, insulation, rubber and lighting/e-waste material benchmarks excluded due to scale.
Want to take a look at even more data? Check out Appendix D.

HOW MUCH IS BEING WASTE[D]?

THE BENCHMARKS

New Fitout Construction
Benchmark: 37.3 kg/m² of NLA

~$105** per m² spent on wasted materials

37.3 kgs wasted for every 1 m²

WE BUILD

**See Appendix A for methodology.

NEW FITOUT CONSTRUCTION

Including commercial and retail developments,

Generated an average of **190.2 tonnes*** of waste[d] materials per site.

Average size 3,096m²

Equivalent to the weight of **11** Melbourne Trams

Broken down per metre², that's **37.3 kg/m²**

the approximate equivalent to throwing out the weight of a dryer every square metre.

1 metre ²

*Based on the total volume of wasted materials from recycling, landfill and WTE across all sites divided by the total number of sites assessed.

COMMERCIAL FITOUT PROJECTS

Average size
5,962m^2

The analysed commercial fitout projects
(new internal office fittings)

Generated an average of **368.6 tonnes*** of waste[d] materials per fitout.

That's the size of 30 double decker buses per site.

~$87** per m^2 spent on wasted materials

This was a tricky one!
There were 4 outliers, which if included would have more than doubled the benchmark.

1 metre^2

Broken down per metre^2, that's **35kg/m^2**

the equivalent to 2 microwaves every square metre.

**See Appendix A for methodology.

RETAIL FITOUT PROJECTS

Average size
231m^2

The analysed retail fitout projects

Generated an average of **12 tonnes*** of waste[d] materials per site.

Equivalent of 5 Toyota Landcruisers!

12 tonnes

Broken down per metre^2, that's **51kg/m^2**

equivalent to the weight of a single-seater sofa every square metre.

~$140** per m^2 spent on wasted materials

1 metre^2

*Based on the total volume of wasted materials from recycling, landfill and WTE across all sites divided by the total number of sites assessed.

WHAT MATERIALS ARE BEING WASTE [D]?

50 Office and Retail Construction Projects Revealed:

What we can tell you..

By weight, the top three categories being waste[d] are 'Mixed Concrete, Masonry and Tiles', 'Lighting and e-Waste', and 'Concrete.'

Fitouts produce less waste per square metre than construction projects, but they are typically stripped and rebuilt every 5 - 7 years - leading to accumulated wastage over multiple cycles.

But, what we can't tell you..

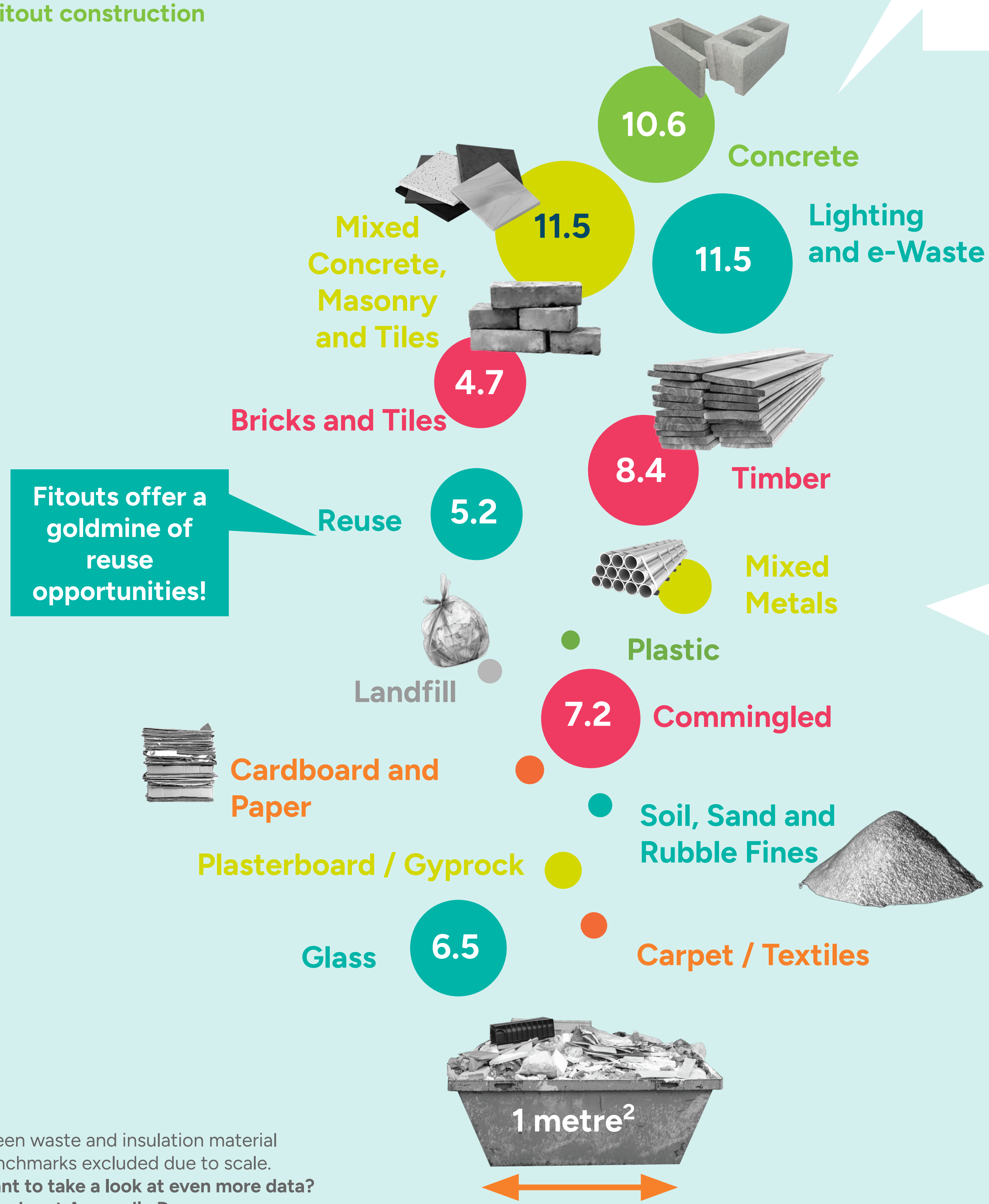
What types of materials are being waste[d] on each project due to very limited data on fitout projects compared to defit projects.

The materials used in fitout are generally less heavy than construction materials, with packaging being more voluminous and problematic with limited recovery options.

WASTE [D] MATERIAL CATEGORIES

New fitout construction

Even though these project sites are smaller, we're still wasting a hefty amount of materials per square metre.



Fitouts are typically stripped and **rebuilt from scratch every 5 - 7 years!**

*Green waste and insulation material benchmarks excluded due to scale.
Want to take a look at even more data? Check out Appendix D.

WHERE ARE THE WASTE[D] MATERIALS GOING?

THE BENCHMARKS

What is currently reported is what is *collected* for recycling, not what is recycled.

83% OF ANALYSED PROJECTS CLAIMED A LANDFILL DIVERSION RATE OF >90%

BUT....

How do we know if we have achieved 90% landfill diversion when...

Estimates are not project specific

- Facility-wide daily averages (skewed by soil-only loads)
- Visual 'eyeball' assessments, prone to inspector bias

No reported evidence of diversion or recycling

- Reports show what is collected, not where it goes
- No tracking of materials post-collection - some materials may be shipped overseas, raising risks of modern slavery and child labor

'Recycling' is used as a catch-all term

Materials are categorised as "recycled" when they are:

- Downcycled (degraded into lower-value products)
- Recycled (processed into new materials)
- Reused (kept in use with minimal processing)

Current reporting doesn't differentiate, distorting the true impact (both positive and negative).

We need to shift from reporting on where materials aren't going to where they are going - and the valuable impact they create in their new life.

WHY?

Read over page to see.

DIVERTED FOR 'RECYCLING'

What is currently reported is what is *collected* for recycling, not what is recycled.

If we reported on actual recycling the figures would be not be in the 90% range!

Let's take a look at plastic for example on an average mixed use construction site with a 92% diversion rate.

Plastics can only be mechanically recycled so many times before the material degrades - essentially being downcycled. The same applies to paper and even for highly recyclable materials like aluminum, about 10% is lost each time it's recycled.

RECYCLING, OR DOWNCYCLING, ULTIMATELY LEADS TO MATERIAL LOSS.

Recycling is defined as . . .

"The reprocessing of discarded waste materials for reuse, which involves collection, sorting, processing, and conversion into raw materials which can be used in the production of new products."

AVERAGE LANDFILL DIVERSION RATES REPORTED

Mixed use buildings 92%

Commercial buildings 88%

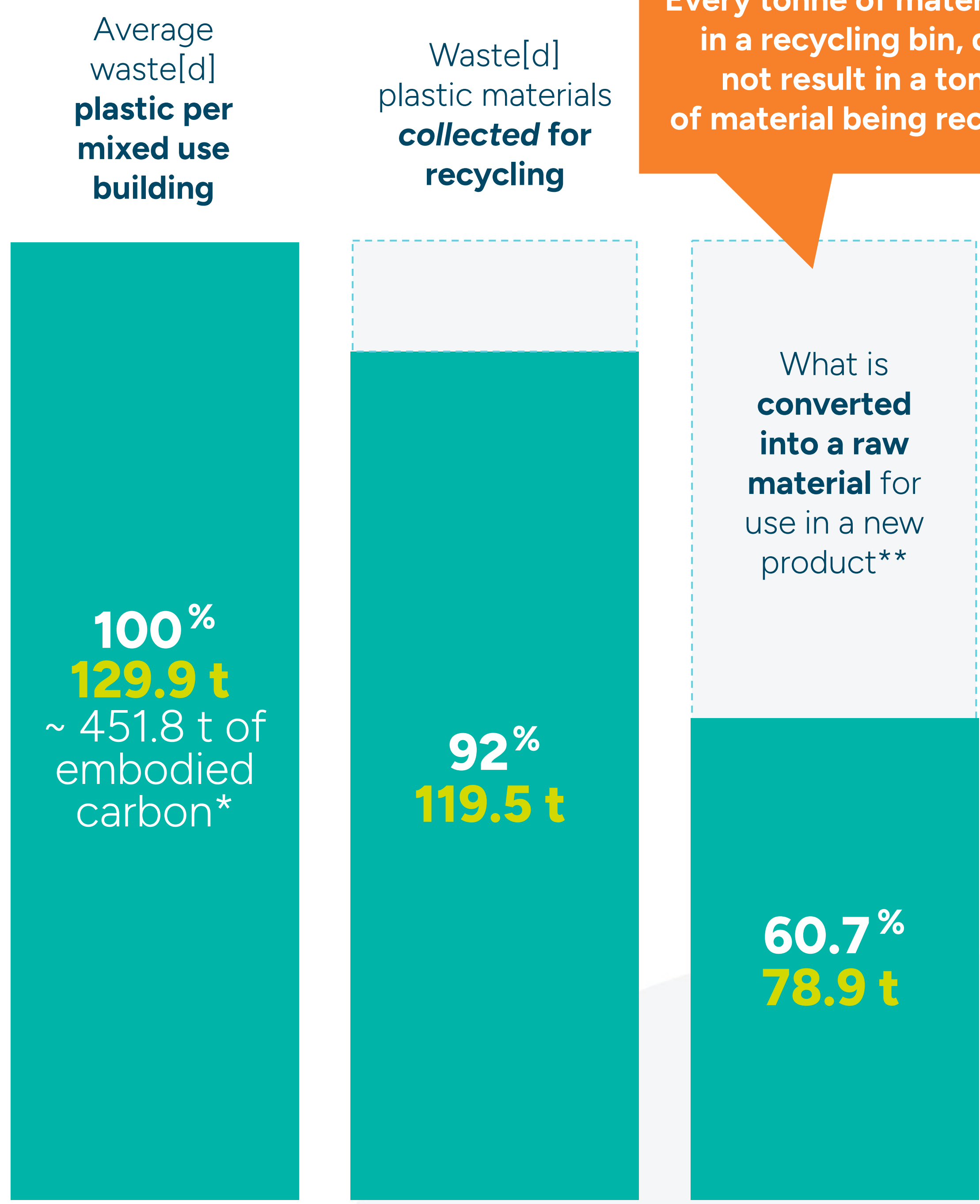
Commercial fitout 91%

Retail fitout 93%

YET . . .

While recycling is the loop of last resort in circularity, it still matters - but we need to shift how we report recycling *versus* what is recycled...

Every tonne of material put in a recycling bin, does not result in a tonne of material being recycled.



Losses are based on average recycling recovery rates of all plastic material types. Plastic value is lost through collection and sorting, the inability to process mixed plastics and degradation that occurs during chemical recycling processes.

*Based on the Embodied Greenhouse Gas Factor for Polyvinyl Chloride Pipe (4.2 CO_2kg e per kg)

**Process yield for conventional plastic recycling is 66% for bales rich in PE & PO film, as well as containing other plastic types

DIVERTED 'FROM' LANDFILL

Wondering about the waste[d] opportunity between unused materials and those going to landfill?

When we hear high landfill diversion rates of 90%, it's tempting to think the job is done and we can simply wash our hands of it.

But low landfill rates don't tell us what's *really* going on.

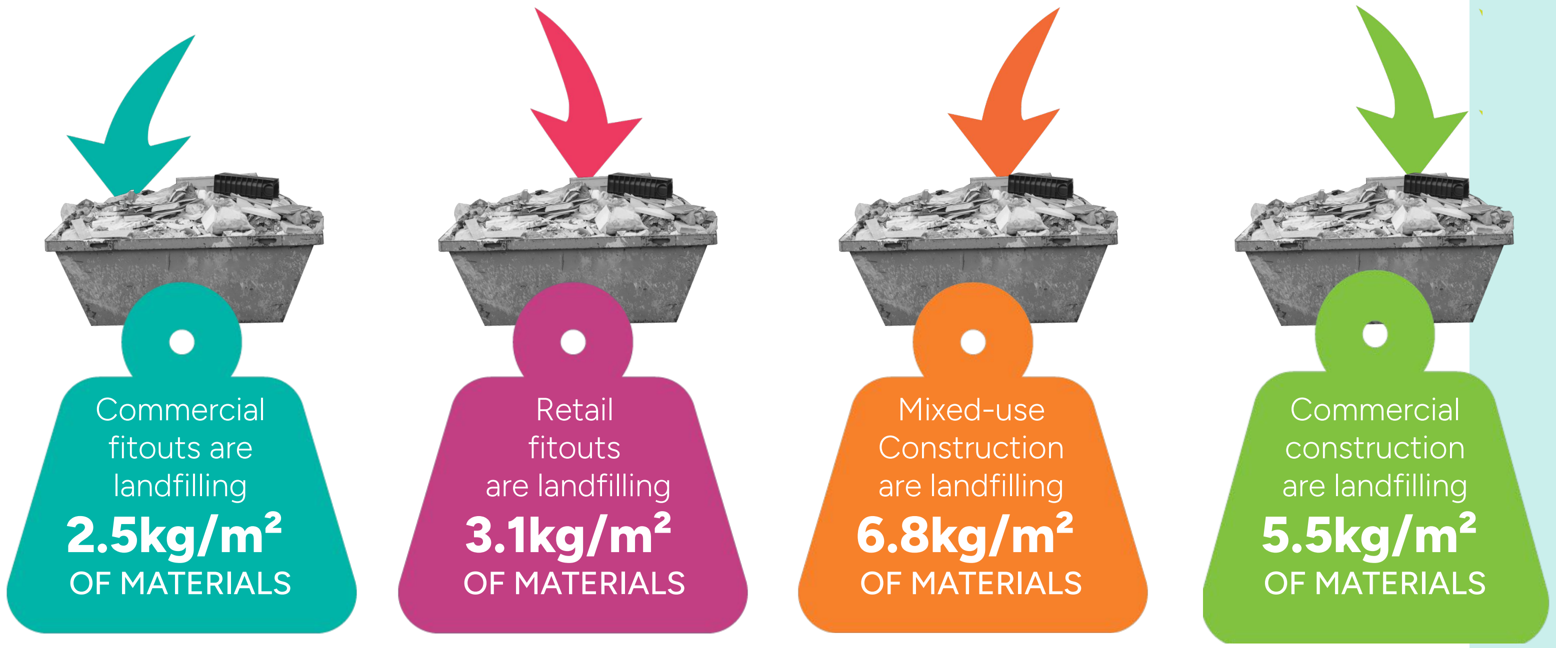
A significant portion of unused materials still end up in landfills due to material losses in collection, sorting and processing. But this isn't counted in landfill diversion rates.

It's not about where the materials aren't going, it's about where they *are* going.

Landfill rates don't tell us what goes to landfill after its 'recycled'.

New building construction projects are sending 127t to landfill on average.

Commercial fitout construction projects are sending 27t to landfill on average.



Relying too much on WTE risks fueling the problem instead of fixing it!

AND WHAT ABOUT WASTE-TO-ENERGY?

Waste-to-energy (WTE) is often included in recycling rates to improve a project's landfill diversion rate.

WTE encompasses a range of technologies - from anaerobic digestion to moving grate incineration - that can vary significantly in their impacts and overall value, depending on the type of feedstock materials used, the end-use of byproducts, the energy recovered, and the current counterfactual disposal/recovery methods available.

When non-renewable materials like plastics are used as feedstock for moving grate incineration, opportunities to maximise material value and extend material can be lost. Although energy is recovered, non-renewable feedstock offers limited alignment with genuine 'waste' reduction goals and can generate emissions and by-products that require careful management. By comparison, using renewable inputs like timber for anaerobic digestion, can contribute to circular outcomes by generating bioenergy and producing fertiliser outputs for agricultural use.

WTE offers some advantages over landfill for managing non-recoverable 'waste', however higher-value and more circular outcomes such as material reduction, reuse, and recycling should be prioritised.

Construction projects are sending 30.4t* waste-to-energy facilities on average.

*Based on 6 assessed sites that utilised WTE as a diversion pathway.

Green Star has focused for far too long on the recycling of construction and demolition waste.

We agree.

WHAT DOES THIS MEAN FOR GREEN STAR?

A lofty endeavour, but one that we must finally say goodbye to.

So, there are three things happening.

Green Star is introducing a 'Waste avoided' Leadership Challenge.
It rewards the use of the Building Materials Reporting Tool to start, and really rewards you for showing that you are doing better than the newly refined benchmarks.

Reusing a building, you'll do great!

Really taking care to not waste materials on site? No problem.

That's what we want to see. The Leadership Challenge is live now, no time like today, and it applies to all building and fitout rating tools.

But, there's doing more.
From 2027, all Green Star Buildings v1.1 projects will be required to report their waste using the Building Materials Reporting Tool.

We need better and more data, and we need it in a consistent manner.

Why from 2027? Because it allows time to work with all the waste contracting facilities to get them to use this document, and giving some time is more than warranted.

But what about fitouts?
Well great news, Green Star Fitouts will also get similar requirements, and an entire Circular category too.

Fitouts are perfect for disassembly, they happen every 5 to 7 years. If we can extend the life, and recover those materials when the time comes, we can significantly reduce the amount of waste from the building sector.

RECOMMENDATIONS

THAT ARE ACTUALLY USEFUL . . .

Each year, we're laying the foundation for better construction material management.

Join us in shaping annual benchmarks that drive progress and momentum across the industry.

Got the data? We're all ears!

When it comes to systems change, it doesn't matter where we start. It matters that we start.

THE RECOMMENDATIONS AREN'T ABOUT REPEATING WHAT'S ALREADY BEEN SAID - THEY'RE ABOUT GETTING THE JOB OF CONSTRUCTING A BETTER FUTURE, DONE.

Clear actions, backed by open-source templates, provide the tools to stop this rubbish - literally.

These actions and templates are contextualised within the value chain, ensuring every stakeholder knows the job they are invited to do. While those jobs may differ along the chain, the templates create one shared blueprint for materials flowing in, being used, and flowing out - keeping resources in play and 'waste' out of the equation.

This is ultimately designed to drive accountability and circularity in construction.

THE JOBS

To be done

To create one shared blueprint of materials flowing in, being used, and flowing out - keeping resources in play and 'waste' out of the equation.

THE TOOLS

To do it with

Disassembly Plan

Building Materials Reporting Tool

Supplier Disassembly Questionnaire

Construction 'Waste' Benchmarks

VALUE CHAIN STAGE	STAKEHOLDERS	REPORTS ON	THE JOB TO BE DONE
CONCEPT & EARLY DESIGN	Owners, Developers, Investors, Architects	**Materials & quantities projected to be used in construction** (flow in)	Set the circular objective & benchmark. Plan & design with reused materials & modularity. Aim to minimise or repurpose projected wastage.
DESIGN DEVELOPMENT & FINAL DESIGN	Architects, Engineers, Quantity Surveyors	**How materials are joined together. What materials & quantities are not required** (flow out)	Revise the design to minimise or repurpose wastage i.e. standard lengths. Design & plan for disassembly. Develop a materials inventory.
CONSTRUCTION PLANNING & PROCUREMENT	Principal Contractors, Procurement Teams, Suppliers & Manufacturers	**What materials are procured** (flow in)	Prioritise procurement of reused materials. Collect & track all product data. Develop an onsite system that collects and directs outflows to predetermined pathways with reuse as a priority.
CONSTRUCTION & FITOUT	Principal Contractors, Trades, Demolition & Waste Contractors	**What materials were used, the excess generated, & where they went** (flow out)	Establish and incentivise onsite material segregation. Record actual volume, weights, & types of materials procured, excess wastage generated and where it went.
COMMISSION & OPERATION	Developers, Asset Owners, Lease Holders, Facilities Managers	**How long materials were used for** (lifespan)	Provide detailed material management information and embed circularity into operational manuals and leasing agreements, ensuring deconstruction responsibilities are defined.
DECOMMISSION	Developers, Demolition & Waste Contractors	**What materials remain for reuse & where materials unfit for reuse went** (flow out)	Use the disassembly plan to ensure reusable materials remain intact and provide them to design teams of the next building or sell on a marketplace.

AND WHERE CAN THIS TAKE US?

Design decisions are continuously improved to reduce waste[d] materials throughout a building's life cycle and to prove it.

FEEDBACK LOOPS

RECOMMENDATIONS

Design decisions play an important role in setting the circular direction.

Brisbane's Midtown Centre sets the benchmark for adaptive reuse with architects stitching together a pair of 1980s office towers. The two buildings are now one 44,000m², 26 storey vertical village. By retaining 50,000t of concrete and 3,600t of steel, the project saved 11,000t of carbon, while shaving 25% off the construction budget.

CONCEPT & EARLY DESIGN

Owners, Developers, Investors, Architects

Our material-per-square-metre benchmarks are free and open source for use - click here!

You can also check out the Green Star Circular Economy Leadership Challenge Credit here!

Set a clear objectives, targets and contractual terms for design, construction, operation and end of life stages to reduce 'waste' throughout the building's life cycle by going above the current material-per-square-metre benchmark.

Design buildings and/or components with modularity, flexibility, adaptability and disassembly in mind - i.e. doing the same with *less*. Ensure components and technical systems are designed with safe and easy access to repair, refurbish, recover and reuse materials at their end of first life.

Prioritise adaptive reuse of existing structures over demolition and building from scratch as a key strategy to beating the material-per-square-metre benchmark.

Record early stage vision for materials i.e x% reused.

Architects, Engineers, Quantity Surveyors

DESIGN DEVELOPMENT & FINAL DESIGN

80% of product impacts are determined in the design stage.

A template for reporting on expected inflowing materials is included in the Building Materials Reporting Tool, free and open source for use - click here!

Work with quantity surveyors to record expected material types and volumes in a materials inventory database - such as an online platform like Madaster or a template. Pass this on to head contractors for construction planning.

Issue a disassembly plan template for relevant disassemblable elements of the building using the information gathered from the questionnaire.

Built & Coreo's disassembly plan template is free and open source - click here!

Curtin University's Legacy Living Lab in Perth is the first building in Western Australia that was designed for disassembly and modularity. The building's profile, constructed on recyclable steel footings which saves 20 tonnes of concrete, was made up of reused materials - 78% of which could be deconstructed and reused at least 3 times. By implementing this model, the emissions impact from demolition and sending valuable materials to landfill was reduced by 90%.

RECOMMENDATIONS

Principal Contractors, Procurement Teams, Suppliers, Manufacturers

CONSTRUCTION PLANNING & PROCUREMENT

Using expected material types and volumes? Define a pathway for all materials types known to be coming off site during construction.

Build into construction contracts the requirement for on-site material management, separation, and recovery according to specified material pathways, as well as reporting against a material-per-square-metre benchmark.

Alter in contracts the ownership and/or responsibility of materials following demolition to retain oversight of the chain of custody.

Use tools like RIB Software to optimise material usage and set customised wastage allowances per contractor.

Prioritise procurement of reused materials, Products-as-a-Service and materials that have Digital Product Passports.

Incorporate into site plans adequate dedicated lay down and material receptacle areas.

Send questionnaire to suppliers and manufacturers requesting greater detail on materials, including their specifications, expected lifetimes, maintenance information, and Environmental Product Declarations (EPDs). All this information should be added to the materials database.

Templates for defining material pathways and reporting on actual materials procured and wasted are all located in the Building Materials Reporting Tool, free and open source for use - click here!

Construction Contractors, Trades, Demolition & 'Waste' Contractors

CONSTRUCTION & FITOUT

Issue material inflow reporting template to subcontractors to record actual material types and volumes procured.

Record actual excess material types, weights, and volumes generated against the material-per-square-metre benchmark using the construction material reporting template.

Weigh materials per load/site to improve reporting accuracy.

Report on monthly materials recovery rates, flows and progress against the material-per-square-metre benchmark (include site GFA/NLA).

Establish dedicated lay down and material receptacle areas on-site to receive and sort materials - if required establish a sortation facility.

Built & Coreo's supplier questionnaire is free and open source - click here!

The Building Materials Reporting Tool also includes a template to record expected material types & volumes - click here!

Continuously reinforce correct on-site segregation behaviour through inclusion in tool box talks, onsite signage, etc.

Provide further incentives for sub-contractors i.e. reconsider payment models like those where bricklayers are paid per number of bricks on site rather than bricks used, incentivising 'wasted' materials.

Supply appropriately labelled containers on project sites to improve material sorting and management.

RECOMMENDATIONS

Developers, Asset Owners, Facilities Managers

COMMISSION & OPERATION

Handover consolidated information in the materials database with details on all materials contained within the building to the asset owner.

Ensure facilities manager receives consolidated information on maintenance and repair, expected lifetimes, and disassembly instructions on materials and products within the building.

Include building refurbishment, maintenance and deconstruction methodology within Operation and Maintenance manuals and build material use reporting into facilities management contracts.

Embed circularity into lease agreements and contracts i.e. fitout make good clause, material selection criteria, and defit or deconstruction responsibilities.

Our material use reporting template is also in the Building Materials Reporting Tool free and open source - click here!

Do it all again! With known information about what materials are in the building, define a pathway for all materials types known to be coming off site during construction and build into construction contracts the requirement for on-site material management, separation, and reuse/ recovery according to specified material pathways, as well as reporting against a material-per-square-metre benchmark.

This time, provide the information in the disassembly plan to contractors to ensure reusable materials remain intact.

DECOMMISSION

Developers, Demolition & 'Waste' Contractors

During disassembly, identify opportunities for reuse and recertification of structural components.

For all reusable materials, provide these to design teams to incorporate into next building. Otherwise, list reusable, intact materials on a "marketplace" that makes reusable materials readily available for other projects, reducing reliance on virgin resources.

RECOMMENDATIONS

Develop a plan to implement the National Circular Economy Framework within the construction industry.

ALL BUILDING STAGES

It's time to stop regulating waste in Australia's construction industry.

Government / Policymakers

Waste should not be regular. It should not exist.

NATIONAL

Embed circular targets into national policies and strategies centred around the delivery of built assets, such as the National Housing Accord, focusing on material reuse and modular design.

Ensure national building regulations prioritise circular principles and practices such as reuse, renovation, retrofitting and modular design.

Develop national extended product responsibility policies to promote closed-loop systems such as designing for disassembly, take-back schemes and Product-as-a-service business models that prioritise keeping materials in circulation over downstream recycling.

Establish circular criteria within federal public procurement policies to support circular materials management and construction techniques.

STATE

Introduce financial incentives such as rebates or subsidies for projects that achieve a high level of material recovery and secondary material reuse, rather than just reporting high diversion rates.

Create dedicated grants for projects that focus on reuse or refurbishment of existing structures.

Establish circular criteria within state public procurement policies to support circular materials management and construction techniques.

Utilise landfill levies to not only discourage landfilling of unused materials, but to reward projects for diverting resources into secondary markets. Offer rebates to recyclers recovering over 90%, with the unrecoverable 10% receiving a full levy rebate if landfilled.

Change state/territory targets from C&D landfill diversion rates to material circularity metrics and recovery channels.

LOCAL

Update local zoning regulations and associated overlays to facilitate the conversion and adaptive reuse of industrial spaces into mixed use or residential spaces.

Ensure local environmental plans and planning schemes prioritise circular principles and practices such as reuse, renovation, retrofitting and modular design.

Establish circular criteria within local public procurement policies to support circular materials management and construction techniques.

This report offers a platform to build a future based on value.

APPENDICES

FOR THOSE THAT LIKE THE DETAILS...

APPENDIX A

WASTED MATERIAL COST

Calculations

While no building profile is the same, the average square metre of a new build weighs ~644 kg/m² (based on National Construction Code Housing Provisions permanent load and average weight estimates of typical residential construction materials: timber flooring and framing, plasterboard, concrete slab, bricks and tiled roofs).

Typically, 40% of construction costs are on materials.

Building an apartment within a multi-use building in a major city like Brisbane can set you back $3,060 and $4,360 per square metre. Other estimates suggest similar ranges between $2,013 and $2,896 for low to high rise residential buildings in Brisbane.

If we use the higher end estimate ($4,360) we can spend up to ~$1,744 (i.e. 40% of $4,360) on materials per square metre.

If we assume that wasted materials are of or around the same value as used materials and if we are wasting 141 kg/m² (which is 22% of total material weight per square metre), then we are spending up to $384 per square metre on wasted materials.

The average new build apartment in Queensland is 137m² which means Australian's can be **spending an average of $52,564 on wasted materials on the higher end.**

If we use the lower end estimate ($2,013), we can spend up to ~$805.2 (40% of $2,013) on materials per square metre. Making the same assumption on material value as above, we could be spending $177.14 per square metre **or an average of $24,269 on wasted materials on the lower end.**

If we extrapolate both higher and lower estimates out to the projected 1.2 million homes to be built by 2029, that's between **$29.12 billion to $64 billion** spent on wasted materials.

These are assumed averages based on available and extrapolated multi-use building data to demonstrate the estimated potential costs of wasted materials. These figures may be subject to external factors such as individual building profiles, inflation, and material costs.

The cost of wasted materials per m² for each typology benchmark was determined based on an average weight of ~644 kg/m² and associated cost of ~$1,744 per m².

APPENDIX B

FURTHER RESOURCES

Design

- Circular Buildings Toolkit
- Demystifying the Circular Economy
- Creating a circular economy for interior fitout design, construction & defit
- Circular Transitions Tool
- The 'Circular-Ready' Built Environment Checklist
- New South Wales Circular Design Guidelines for the Built Environment
- Podium - integrated design

Designing for Disassembly

- Guide to Disassembly - plan, questionnaire and template
- ISO 20887: Sustainability in buildings and civil engineering works - Design for disassembly and adaptability

Materials

- Responsible Products Guidelines
- Mindful Materials Reference Guide

Material Reuse Platforms

- Rosella Street
- FTD Circular
- Superyard

Material Tracking Platforms

- RIB Software
- Madaster

APPENDIX B

DATA COLLECTION & BENCHMARK CALCULATIONS

Building the Numbers

- Each data source was reviewed to identify key project details such as typology (mixed use construction, commercial construction, commercial fitout or retail fitout), location, relevant parties (i.e. developer, construction party, waste contractor), size (GFA for construction or NLA for fitout), waste collection data and the respective date range of the project.
- The waste collection data of each source was anonymised and used to identify recovered material streams that were reported as recycled, reused, and/or diverted as well as material that was sent to landfill or waste-to-energy facilities. Material weights were recorded in tonnes (t) and categorised into normalised material categories where similar material types were aggregated. These normalised material categories included: bricks/tiles, concrete, asphalt, soil/sand/rubble fines, ferrous metals, non-ferrous metals, timber/chipboard/formply, green waste, cardboard/paper, plastic, polystyrene, plasterboard/gyprock, glass, insulation, rubber, lighting/e-waste, carpet/textiles. In cases where data sources lacked specific waste material delineation, project waste was categorised under broader material groups (i.e. metal was aggregated up from ferrous metal and non ferrous metal and included as "Mixed metal"). These broader categories were not duplicated in data entries for more specific categories.
- The weight (t) of reported recycled or reused material per normalised material category was converted to kilograms and divided by each project site's gross floor area (GFA) (mixed use and commercial typologies) or net lettable area (NLA) (fitout typologies) to determine a kilogram-per-square-metre (kg/m^2) figure. GFA was used for mixed use and commercial typologies while NLA was used for fitout typologies.

APPENDIX B

DATA COLLECTION & BENCHMARK CALCULATIONS

Building the Numbers continued...

- The total 'waste' (t) generated per project was recorded as all materials *not utilised* on site including: landfilled materials, materials sent to waste-to-energy facilities as well as materials *collected* for recycling.
- These material pathway categories were also averaged individually against the project site's GFA or NLA to determine a kg/m^2 average as well as averaged across all sites to determine the average amount produced per site (t). These site averages were not scaled to building sizes (i.e. GFA or NLA) due to significant range in the data which skewed the results per site.
- A diversion percentage was calculated by dividing the total recycled or reused amount (t) by the total waste generated (t).
- Benchmarks for each normalised material category, including broader material categories, as well as the total project waste and respective material flow channels were calculated by averaging all data points within each category.
- As the material profile of any building is going to be different to the next, some data points did not include weights for all material types. As such, the benchmarks represent an average of materials used across a variety of projects.
- The benchmarks that detailed the total overall 'Waste', Recycling & Reuse, Landfill and Waste to Energy per-square-metre were the most significant to calculate, and best reflect real-world onsite material management as they were built from the largest pool of data points.

APPENDIX C

COMPARISON

Per-Square-Metre Benchmark Vs. Percentage-Based Benchmark

To develop the benchmarks, we compared both a waste-per-square-metre and a waste diversion percentage approach. We arrived at developing a per-square-metre benchmark due to a number of reasons:

Both approaches provide value when measuring material flows, but a per-square-metre benchmark offers a more contextualised view of waste volumes in relation to a project's scale. This allows for a more accurate assessment of wasted material management and enables comparisons between projects of both total materials wasted and total materials to landfill. However, this method carries an underlying assumption: the larger the building, the more waste is generated. A general industry practice involves a 10% over-order of materials to prevent construction delays, meaning that for larger projects, a 10% over-order translates to significantly more waste.

A diversion percentage-based benchmark directly measures the proportion of wasted materials diverted from landfill relative to total wasted materials generated. While it focuses on avoiding landfill, it lacks context about a project's scale, making it difficult to compare material redirection efforts across projects. Without this context, a high diversion rate could result from generating excess material and sending it to recycling or waste-to-energy facilities, rather than reducing waste during planning or finding ways to reuse materials onsite or offsite. This may shift the focus from true material reduction to creative reporting.

Given this, the waste-per-square-metre benchmark was preferred, as it creates a more level playing field. This approach allows for meaningful comparisons between projects and provides a clearer picture of material management efficiency.

APPENDIX D

BENCHMARKING SUMMARY - KG/M²

	New Building Construction Benchmarks (kg/m²)						New Fitout Construction Benchmarks (kg/m²)					
	Mixed Use Construction		Commercial Construction		Mixed Use & Commercial Construction Combined		Commercial Fitout		Retail Fitout		Commercial & Retail Fitout Combined	
Recycled Material Categories (kg/m²)	Average Benchmark (kg/m²)	Data point per material category	Average Benchmark (kg/m²)	Data point per material category	Combined Weighted Average Benchmark (kg/m²)	Data point per material category	Average Benchmark (kg/m²)	Data point per material category	Average Benchmark (kg/m²)	Data point per material category	Combined Weighted Average Benchmark (kg/m²)	Data point per material category
Bricks / Tiles	3.7	19	10.6	25	7.7	44	4.8	11	3.8	1	4.7	12
Concrete	28.9	24	56.8	31	44.6	55	11.4	18	6.1	3	10.6	21
Mixed Concrete, Masonry and Tile	157.3	24	41	12	118.6	36	10.4	15	17.1	3	11.5	18
Asphalt	1.9	3	3.3	5	2.8	8	0	0	0	0	0.0	0
Soil / Sand / Rubble Fines	6.5	13	57.6	20	37.5	33	2.7	8	0	1	2.4	9
Ferrous Metals	7.2	18	6.7	20	6.9	38	2.4	13	10.4	2	3.5	15
Non-Ferrous Metals	0.9	12	1.1	12	1	24	0.7	10	0.8	2	0.7	12
Mixed Metals	20.9	33	13.3	27	17.5	60	6	33	8.9	4	6.4	37
Timber	22.2	42	17.6	41	19.9	83	8.3	40	8.7	6	8.4	46
Chipboard & Form Ply	0	0	3.7	1	3.6	1	0	0	0	0	0.0	0
Green Waste	1.4	11	1.1	11	1.3	22	0	3	0	0	0.0	3
Cardboard / Paper	5.3	42	3.1	41	4.2	83	2	41	4.5	4	2.2	45
Plastic	4	26	3	31	3.4	57	1.2	32	4.9	5	1.7	37
Polystyrene	0.1	4	0.1	4	0.1	8	0.2	5	0	0	0.2	5
Plasterboard / Gyprock	5.3	40	3.9	34	4.7	74	4.5	41	9.5	7	5.2	48
Commingled Recycling	16.6	14	8.12	19	11.7	33	6.2	21	14.2	3	7.2	24
Reuse	1	1	0	1	0.5	2	0.8	4	0	0	0.8	4
Glass	0.2	5	1.1	7	0.8	12	5.1	6	10.7	2	6.5	8
Insulation	0	0	0.2	7	0.2	7	0.2	8	0	0	0.2	8
Rubber	0	0	0.1	1	0.1	1	0	0	0	0	0.0	0
Carpet / Textiles	0	0	0	0	0	0	2	3	0	0	2.0	3
Lighting / E-waste	0	1	0	0	0	1	0.8	4	32.9	2	11.5	6
Total Collected for Recycling	150.8	48	121	44	136.6	92	31.8	43	47.4	7	34	50
Total Reuse	1.0	1	0	0	1.0	1	5.2	2	0	0	5.2	2
Total Landfill	6.8	48	5.5	44	6.2	92	2.5	43	3.1	7	2.6	50
Total Waste to energy	25.9	1	31.9	3	30.4	4	1.1	4	0	0	1.1	4
Total Waste (Landfill, WTE, Recycling)	152.9	48	128.7	44	141.3	92	35.2	43	50.5	7	37.3	50
Diversion Percentage (%)	92%	48	88%	44	90%	92	91%	43	93%	7	91%	50
Average total waste (kg/m²) by ALL typologies (relative to total data points per typology - excludes combined typologies)	141.4						37.9					

APPENDIX E

BENCHMARKING SUMMARY

Tonnes

SITE AVERAGE PER TYPOLOGY (TONNES)				
Total Averages Per Typology	Mixed Use Construction	Commercial Construction	Commercial Fitout	Retail Fitout
GFA / NLA	31316.9	22879.2	5961.8	230.9
Recycling (tonnes)	2101	1746.9	340.9	10.6
Landfill (tonnes)	147.2	106.7	27.1	0.63
Total Waste (Landfill, WTE, Recycling) (tonnes)	2279.3	1879.5	368.6	11.9
Average wasted material generated per site by ALL typologies (tonnes) (relative to total data points per typology - excludes combined typologies)	3096.3		190.3	

APPENDIX F

BENCHMARKING FORMULA Summary

Summary of Formula		
Formula	Benchmark (kg/m²)	Site Average (tonnes)
Material Categories PER site	Each recycled material value (tonnes) was recorded from a site's waste reporting. Each value was converted to kilograms (multiplied by 1000) and then divided by the site's GFA/NLA to determine the benchmark in kg/m². $\frac{\text{Material category (tonnes) x 1000}}{\text{GFA/NLA}}$	N/A
Material Categories of ALL sites	The average of all sites' per material category (kg/m²).	
Total Recycling PER site	The sum (tonnes) of ALL material categories (tonnes), converted to kilograms (multiplied by 1000) and then divided by the site's GFA/NLA to determine the benchmark in kg/m². $\frac{\text{Sum of ALL material categories (tonnes) x 1000}}{\text{GFA/NLA}}$	The average of all sites' total recycling waste (tonnes).
Total Landfill PER site	This figure (tonnes) was recorded from the site's waste reporting, converted to kilograms (multiplied by 1000) and then divided by the site's GFA/NLA to determine the benchmark in kg/m².	The average of all sites' total landfill waste (tonnes).
Total Landfill of ALL sites	The average of all sites' Total Landfill benchmark (kg/m²).	
Total Waste PER Site	The sum (tonnes) of an individual site's total landfill, waste-to-energy, and recycling, converted to kilograms (multiplied by 1000) and then divided by the site's GFA/NLA to determine the benchmark in kg/m².	The average of all sites' total waste (tonnes).
Total Waste of ALL Sites	The average of all sites' Total Waste PER Site benchmark (kg/m²) (as above).	
Average total waste (kg/m²) by ALL typologies (relative to total data points per typology - excludes combined typologies)	$\frac{\text{(Mixed Use Total Waste x Total Mixed Use Data Points) + (Commercial Total Waste x Total Commercial Data Points)}}{\text{(Total Mixed Use Data Points + Total Commercial Data Points)}}$ The same process was conducted for commercial and retail fitout.	N/A

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APPENDIX G

CONVERSION FACTORS

Category	Weights		Weight Equivalent	Conversion Calculation
	Benchmarks (kgs/m^2)	Average material per site (t)		
New Construction Buildings Average Wasted Material Weight Per Site (t)		2,079	An Airbus A380 plane has the maximum takeoff weight of 575 t.	2079 / 575 = 3.6
New Mixed-Use Construction Building Average Wasted Material Weight Per Site (t)		2,279	A Mack truck has the Gross Combined Mass of 110 t per site.	2,279 / 110 20.7
New Mixed-Use Construction Building Benchmark (kg/m^2)	153		A console piano can weigh (on the lower end) 159 kgs.	153 / 159 = 0.96
New Commercial Construction Building Average Wasted Material Weight Per Site (t)		1,879	A Boeing 747-8 plane has the maximum take-off weight of 442.3 t.	1,879 / 422.3 = 4.25
New Commercial Construction Building Benchmark (kg/m^2)	128		An average scooter can weigh 136 kgs.	128 / 136 = 0.94
Commercial and Retail Construction Fitout Average Wasted Material Per Site (t)		190.4	The weight of a W Class Melbourne Trams is 17.07 t.	190.4 / 17.07 = 11.15
New Fitout Construction Benchmark (kg/m^2)	37.9		A vented dryer on average weighs between 27 - 40 kgs.	37.9 / 40 = 0.95
Commercial Fitout Average Wasted Material Per Site (t)		368.6	The unladen weight of a double decker bus is equal to 12.4 t.	368.6 / 12.4 = 29.73
New commercial construction fitout benchmark (kg/m^2)	35		The average countertop microwaves ranges between 13 - 23 kgs. The midpoint of this range is 18 kgs.	35 / 18 = 1.94
Retail fitout Average Wasted Material Per Site (t)		12	The approximate kerb weight of a GX Toyota Landcruiser 300 is 2.5 t.	12 / 2.5 = 4.8
New Retail construction fitout benchmark (kg/m^2)	55		An average single-seater sofa can weigh approximately 56 kgs.	55 / 56 = 0.98

We also need to waste less!

Got data?
Help build the next generation of benchmarks!
Reach us at
hello@coreo.com.au

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Green Building Council Australia

cefc

NSW GOVERNMENT