



Supplying a solution in Australia's ongoing water crisis



EcologiQ

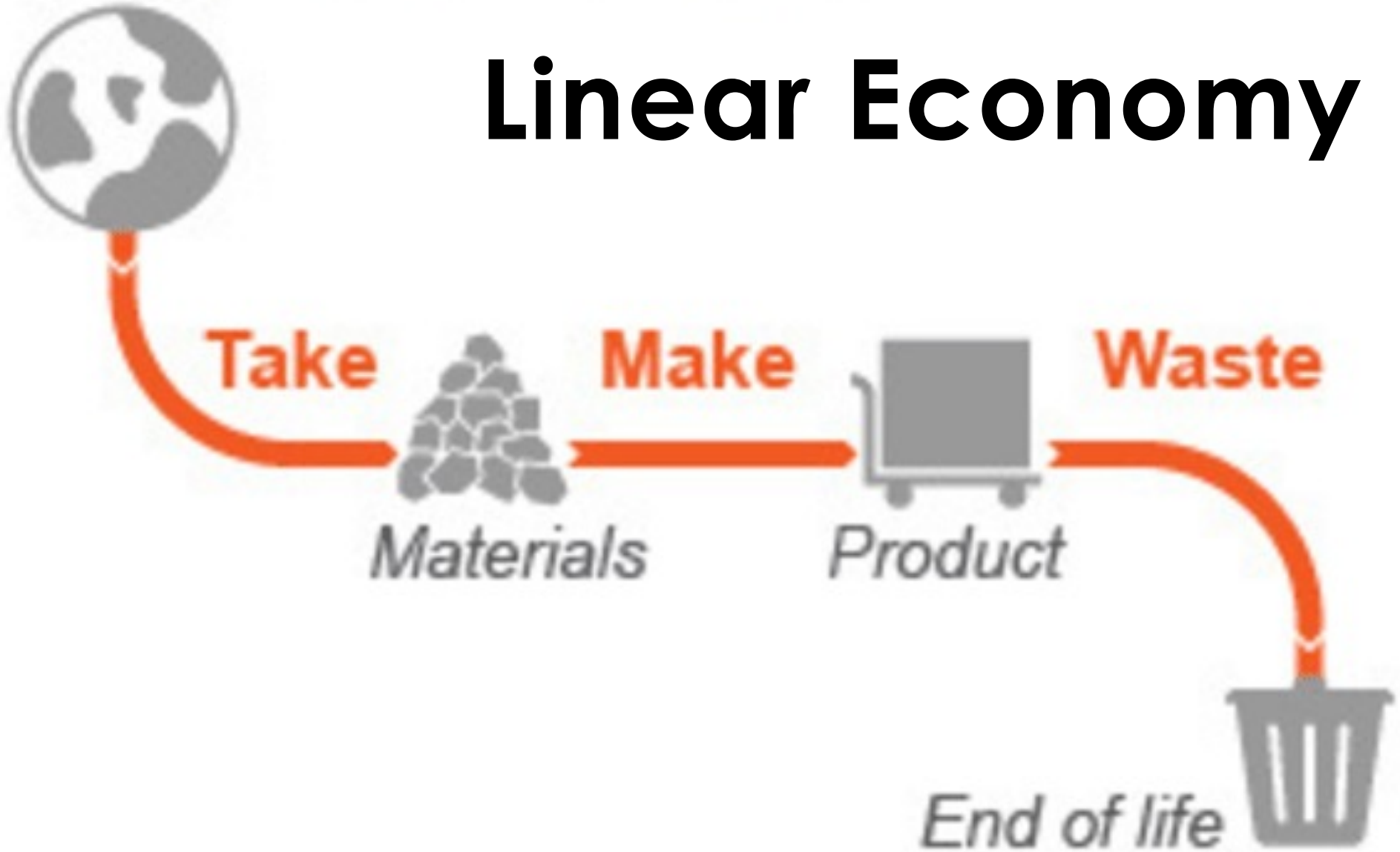


Waste



Climate

Linear Economy



Circular Economy



The 'circular economy' of household waste

**We can
collect it!**

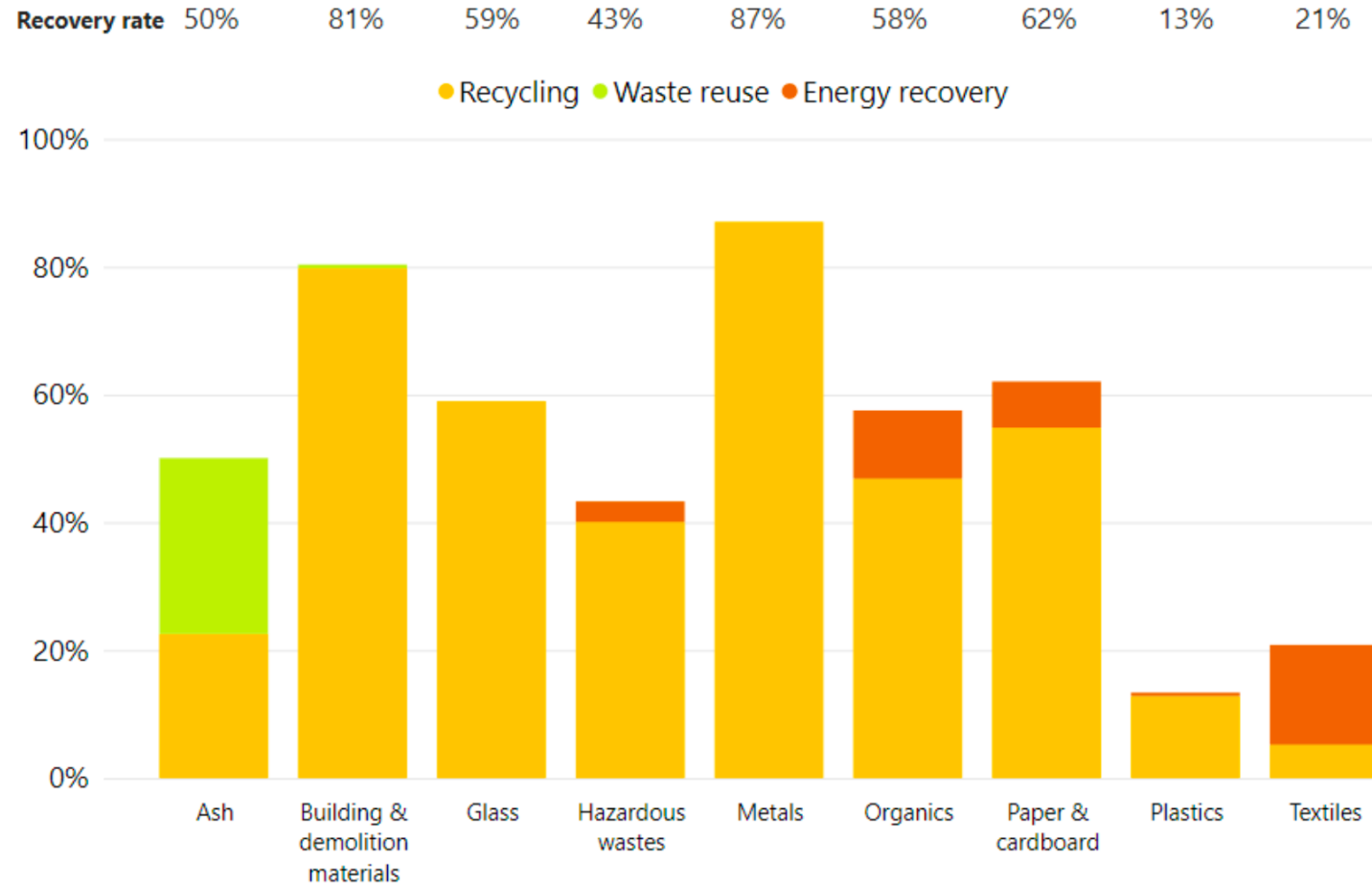


**We can
collect it?**



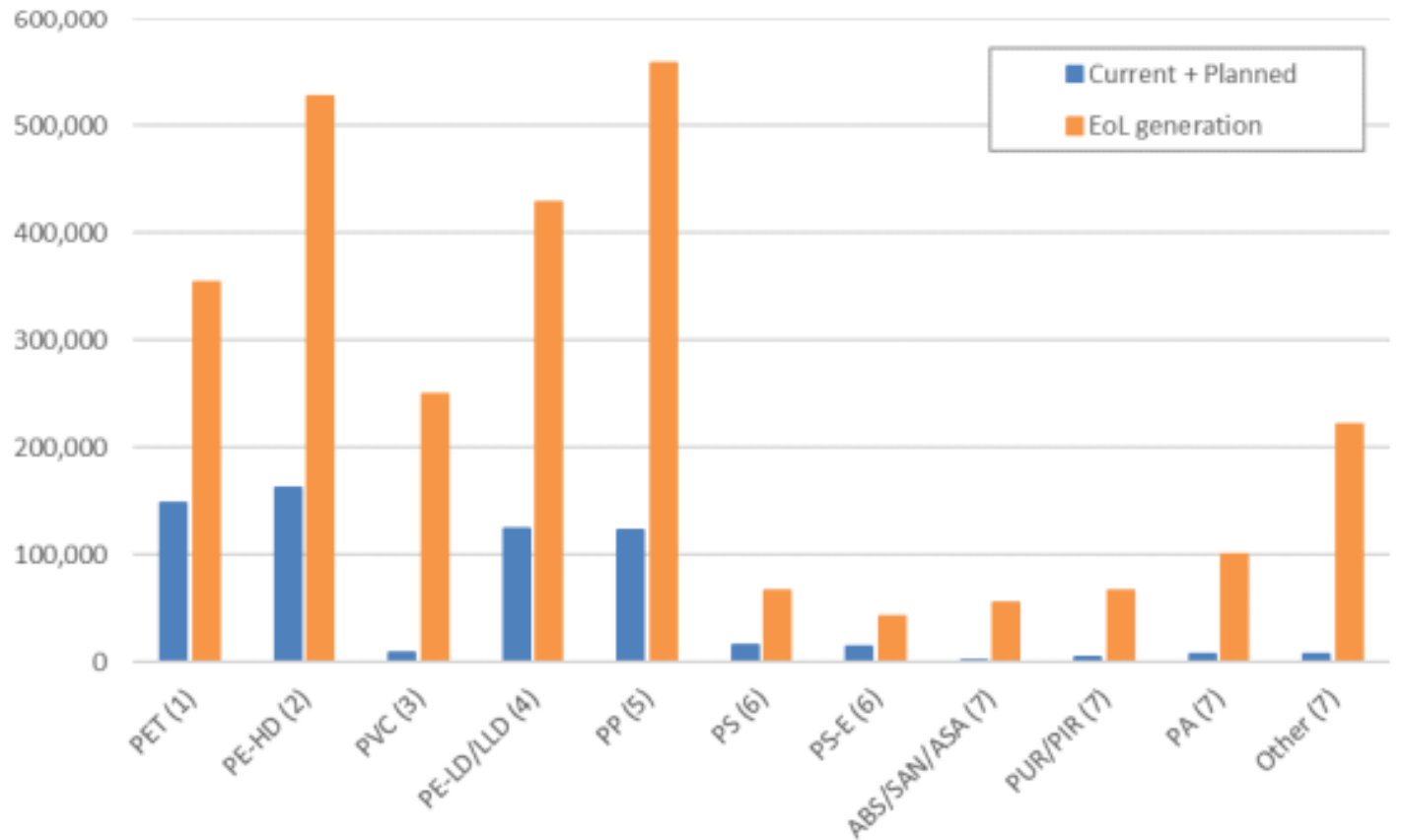
We can
recycle
(some
of it)

Figure 32 Resource recovery rates by material category, Australia 2020–21



We can
recycle
(some
of it)

Figure 36 Current + Planned reprocessing capacity relative to estimated EoL generation in 2024–25



Don't put
material that
won't be
recycled in
the system







X



NEW CLEAR BOTTLE

**SAME
GREAT TASTE**



**CLEAR BOTTLES
ARE EASIER
TO RECYCLE
INTO OTHER
BOTTLES.***

*compared to green plastic bottles

PS. I have cracked the design problem for you, feel free to use.



PS. I have cracked the design problem for you, feel free to use.





The fire that sparked the end of Coles and Woolies plastic recycling program

November 10, 2022 – 2.26pm

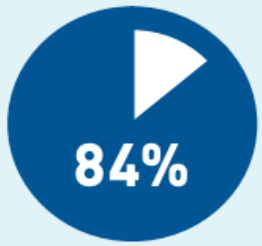


RECYCLING FACTORY FIRE

HUME HIGHWAY CLOSED IN BOTH DIRECTIONS LAST NIGHT

**7
NEWS**



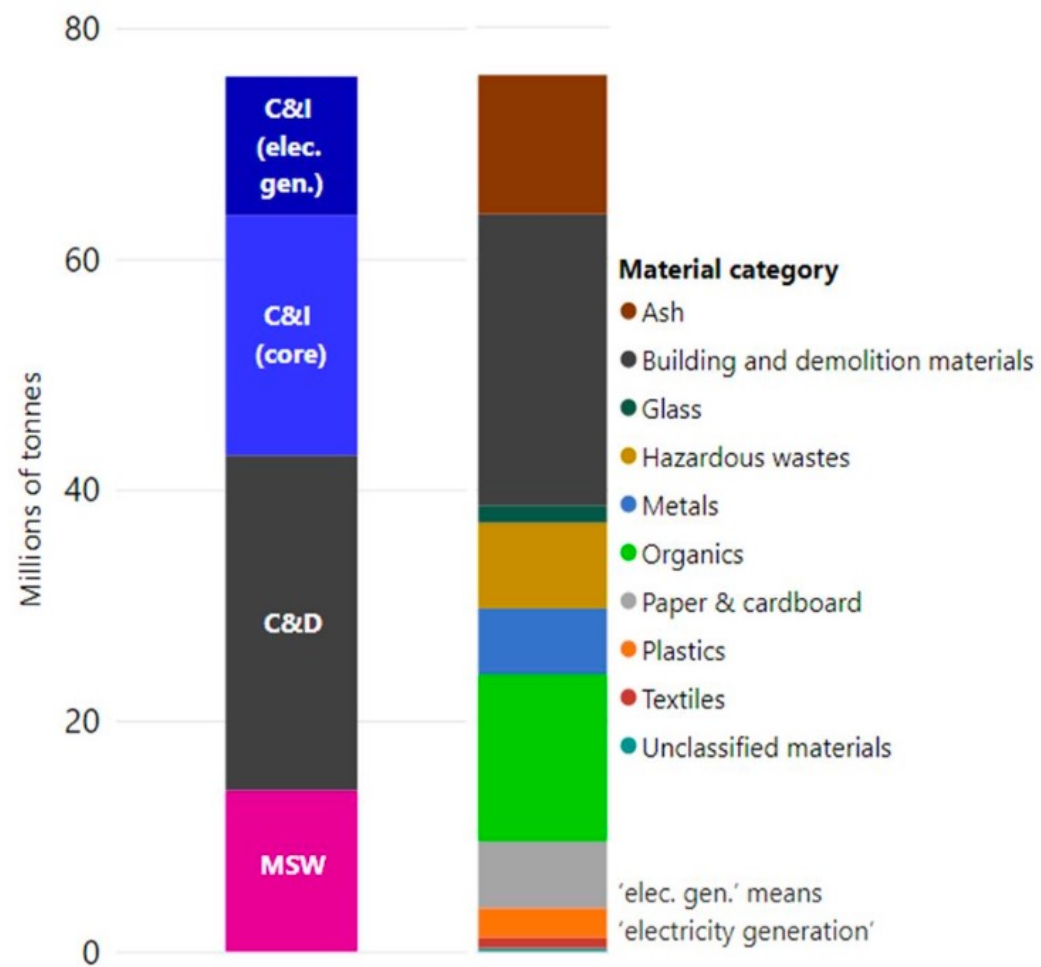


84% of plastic is sent to landfill and only 13% is recycled.

**We need demand
for recycled
content?**

The infrastructure opportunity

Figure 1 Waste generation by material category and stream, Australia 2020–21 (core waste plus ash)



a) Technology

b) Change habit

c) Change rules

d) Change incentives

Change habit

From 1 March 2020, all tenderers on Victorian major transport infrastructure projects are required to demonstrate within their tender, how they will optimise the use of recycled and reused materials at the levels allowed under current standards and specifications.

Change rules

- **Standards tend to favour existing tech**

Current standards?

To use recycled crushed glass in NSW:

- Glass must be cleaned
- Comply with TfNSW Granulated Glass Specification 3154
- Under Annexure 3154/L requires testing

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Granulated Glass Aggregate

D&C 3154

ANNEXURE 3154/L – MINIMUM FREQUENCY OF TESTING

Refer to Clause 2.4.

Property	Test Method	Minimum Frequency of Testing
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(TfNSW COPYRIGHT AND USE OF THIS DOCUMENT - Granulated Glass Aggregate

Percentage of oversize material	TfNSW T279	1 per Lot
Flow time		
Uncompacted void content		
Dry particle density	AS 1141.5	One test every 3 months
SSD density		
Water absorption	AS 1141.5	One test every 3 months

Current standards?

To use recycled crushed glass in NSW:

- Glass must be cleaned
- Comply with TfNSW Granulated Glass Specification 3154
- Under Annexure 3154/L requires testing
- Can be used for R116, R117, R118 and R121 asphalt specifications
- 10% limits in asphalt base

Mordialloc Freeway noise wall trial



Pact Group transforms 600 tonnes of plastic waste into recycled noise wall solution for Mordialloc Freeway

28 February 2021

Victoria is set to house Australia's most sustainable noise walls thanks to innovative technology by Pact Group. Situated along Mordialloc Freeway, the walls will transform 570 tonnes of hard-to-recycle plastic materials into panels spanning 32,000 square metres.

Regulatory Hurdles

To support the plastic waste stream, Major Roads Projects Victoria (MRPV), EcologiQ, the Department of Transport Victoria (DoT), and the Australian Road Research Board (ARRB) have collaborated to develop a new technical specification for plastic noise walls. The specification allows up to 100% recycled material content and is an Australian first for a technical document of this nature.

ecologiQ

Recycling or Downcycling?

Mordialloc trial 30 million plastic bottles







**Are you
replacing
virgin
materials?**

**Does it have a
lower carbon
footprint?**

Recycling waste plastics in roads: A life-cycle assessment study using primary data

J. Santos ^a, A. Pham ^b, P. Stasinopoulos ^b, F. Giustozzi ^b  

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<https://doi.org/10.1016/j.scitotenv.2020.141842> 

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Highlights

- Primary data was collected from plastic recycling companies in Australia.
- Waste plastic as polymer in bitumen produces considerable environmental benefits.
- Recycling plastics to produce synthetic asphalt aggregate is minimally beneficial.
- Recycling locally amplifies the environmental benefits of using plastics in roads.

Change incentives



Cost?

Mordialloc Freeway noise wall trial





\$1,749.00



50 units



Recycled Fibre Hi Vis Vest made in Melbourne.

\$1,749.00

Safety Orange 50 units

1

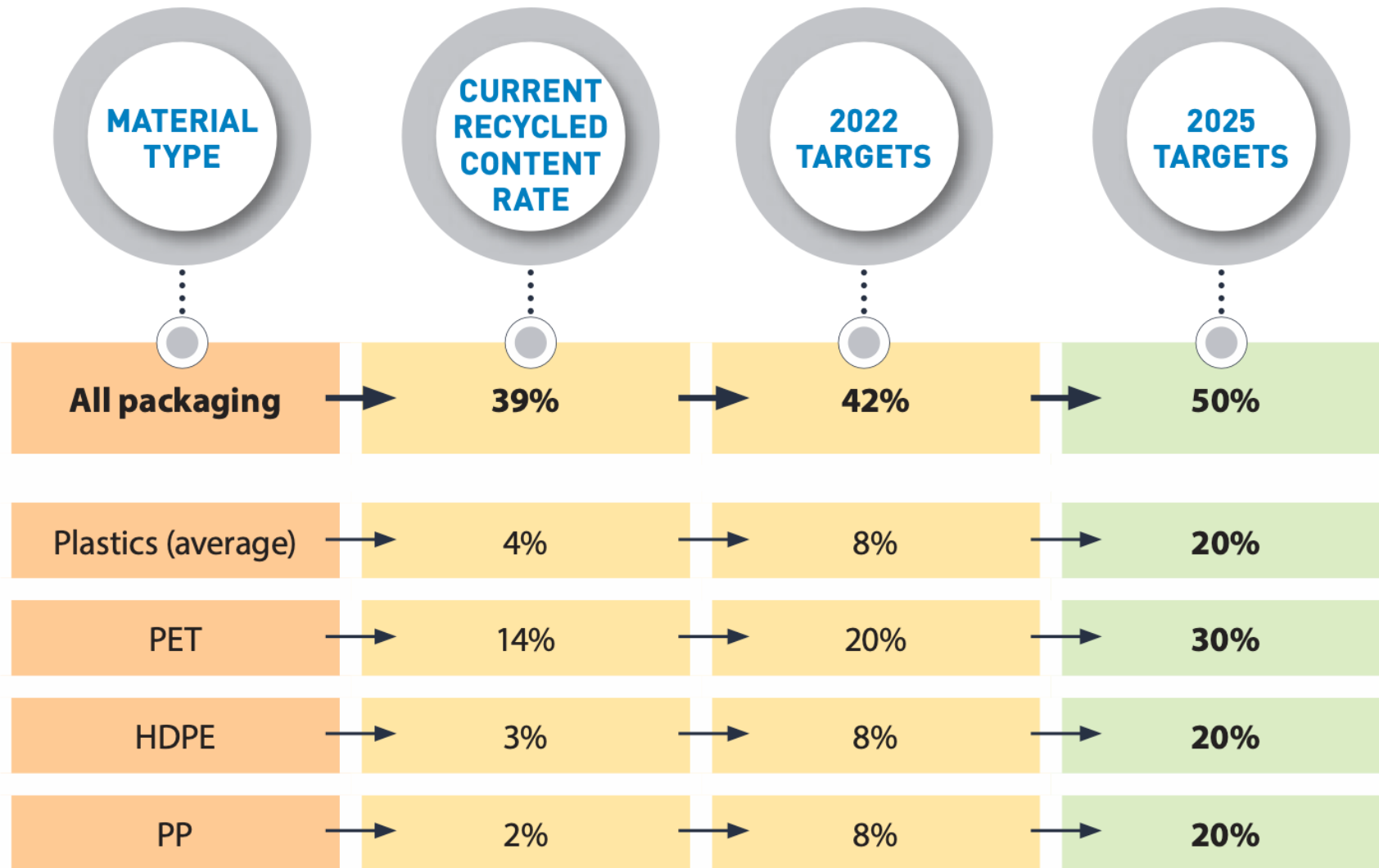
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**Mandatory
Targets?**



Sources: Australian Packaging Covenant Organisation – Australian Packaging consumption and recycling data 2018-19.
2025 National Packaging Targets Organisation monitoring program.

**What if it is more
expensive?
Who pays?**

Producer Responsibility

Virgin Plastics Tax?



**Reduction of
emissions?**

The green credentials of eMesh have been tested by researchers, reporting up to 90% saving on CO2 emissions and reduced fossil fuel usage compared to traditional steel mesh reinforcing.

ENVIROMESH[®]



Sustainable Outcomes Certificate

This is to certify that the

Mordialloc Freeway is a  *green road*


built by

McConnell Dowell Decmil Joint Venture

with sustainable materials supplied by Alex Fraser.

The use of  *green roads* asphalt and roadbase on this project has:

- Diverted more than 249,739 tonnes of recyclables from landfill,
- Reduced carbon emissions* by more than 2,692 tonnes

The use of  *green roads* asphalt and roadbase on this project has:

- Diverted more than 249,739 tonnes of recyclables from landfill,
- Reduced carbon emissions* by more than 2,692 tonnes
- Recycled more than 204 million glass bottles, the equivalent of 512,511 wheelie bins.

Up to December 13, 2021

Building greener roads

asphalt . aggregates . roadbase . sand

phone: 136 135 info@greenroads.com.au greenroads.com.au



Sean McCormick

GENERAL MANAGER | RECYCLING

Value of this...

Targets

Federal:

**43% reduction
of greenhouse
gas emissions
by 2030 below
2005 levels.**

**Net zero by
2050.**

Victoria:

**75-80%
below 2005
levels by
2035.**

**Net zero by
2045.**

Melbourne Council:

**Net zero by
2040.**

Our target is to reduce our emissions generated by Scope 1 (primarily fuels) and 2 (purchased electricity) to net zero by 2038 and to achieve net zero for Scope 3 (primarily materials such as concrete, steel and bitumen, as well as waste and travel) by 2045.



**Targets:
50% reduction of scope 1 and 2 by 2032.
Net zero* in scope 1, 2 and 3 by 2050.**

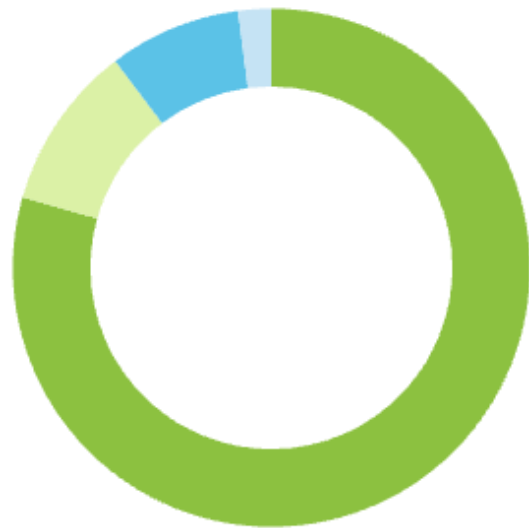


We've made it our mission to achieve Net Zero Carbon by 2025 and Absolute Zero Carbon by 2040, with no offsets and no excuses.



Is it being tracked?

GHG emissions reductions from the use of recycled products in asphalt production (tCO₂-e)



Reclaimed Asphalt Product (RAP)	77.70%
Fly ash	10.90%
Slag	8.80%
TonerPlas (MTP with plastic)	2.40%
Modified Toner Polymer (MTP)	0.10%
Glass	0.10%
Reconomy and glass sand	0.00%
Crumbed rubber	0.00%

End of life...

Green Pipe

We've diverted 17.2 tonnes of plastic from landfill (just on this job)... that's about 431,540 plastic bottles!





**RESOURCEFUL
LIVING**
SUSTAINABLE FURNITURE

Advanced / “Chemical” Recycling





Enzymes

Use enzymes which can attack complex plastics (polymers), reverting them back to their original chemical building blocks (monomers).

Nylon and PET.

Building \$25 million R&D facility in Queanbeyan.

Cat HTR

Use hydrothermal liquefaction to break down both natural polymers (biomass) and man-made polymers (plastic) back into oil.

Mixed plastics.

Building plant in Vic with AMCOR. 20,000 tonnes per annum

Pyrolysis

Use traditional pyrolysis technology to break plastics back into oil using high heat.

HDPE, LDPE, PP

Upgrading to 5 tonne machine that can process 1800-tonne a year.



Supplying a solution in Australia's ongoing waste crisis



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