SUBMISSION

Australian Productivity Commission Interim Report, Australia's circular economy: Unlocking the opportunities

INTRODUCTION

The Australian Tyre Recyclers Association (ATRA) supports the Productivity Commission (PC) assessing opportunities for increased collection and recovery of Off The Road (OTR) tyres; and we would add to this assessment the significant quantities of rubber conveyor belt materials also largely disposed of in-pit/ on-site at Australian mines.

ATRA is pleased to provide the PC with its members expertise regarding OTR and conveyor belt recovery and the significant opportunities for this material to be returned for beneficial secondary use.

ATRA has several members (www.atra.asn.au) already engaged in the recovery of used OTR tyres and this segment of the market is a significant new source of recovered materials for the recycling industry.

CURRENT LEGISLATIVE LANDSCAPE

ATRA represents the interests of the legal and sustainable used tyre collection and recovery sector in Australia (https://atra.asn.au/). ATRA members have played a critical role in the development of new and improved regulations at a state and territory as well as federal level. These regulatory reforms have included;

- Enhanced licencing, stockpile, storage and transport regulations across states
- Ongoing support and intelligence gathering for state environment authorities' compliance programs tackling illegal waste generators, collectors and recyclers
- Investigations and advocacy leading to the Commonwealth government's ban on the export of whole baled tyres
- Ongoing support to the Commonwealth investigating illegal exports

ATRA is supportive of regulations in the sector to help guard against unsustainable operators which disadvantage the legitimate industry, the community and environment.

THE MARKET

The number of tyres in Australia's used tyre market is estimated to be one-third passenger tyres, one-third commercial (truck and bus) and the remaining third OTR (off-the-road – mining, earthmoving and agricultural) tyres.

While the passenger and commercial sectors achieve world class rates of collection and recovery (96%-97% collection and legal disposal), collection rates from the OTR sector are extremely poor at around 13%.

As the following table highlights, passenger and commercial tyres have a recovery rate[1] of 88% and 85% respectively, with an additional approximate 8%-10% legally disposed to landfill; and around 4% illegally stockpiled or disposed of. All states and territories now significantly limit

[1] https://www.tyrestewardship.org.au/wp-content/uploads/2025/01/Australian-Tyre-Consumption-and-Recovery-2023-24.pdf

stockpiling of used tyres, ban dumping and track waste movements to ensure against illegal disposal. ATRA strongly supports these regulatory compliance efforts.

Therefore, unlike the OTR tyre market being canvassed here, there is no credible public policy evidence that intervention in the passenger and commercial used tyre markets is required or would be warranted.

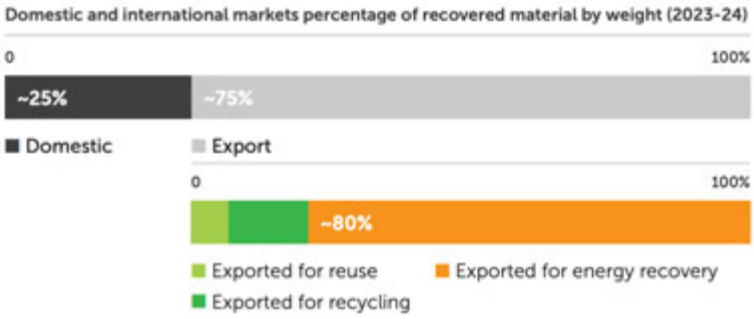
Existing markets

In terms of secondary use, the vast majority of the worlds and Australia's used tyres are converted to a tyre derived fuel (TDF) and used to replace coal in cement kilns and other energy intensive sectors. An additional volume, around 10%-20% in Australia, are processed into various grades of rubber crumb for use in asphalt, soft fall surfacing, adhesives and other applications.

The following outlines domestic and export market outcomes; this includes large volumes of TDF currently being exported to Japan's cement industry and other SE Asian markets. As tyres are never-meant-to-come-apart secondary uses are not easy to manufacture, and pure circular economy outcomes are rare, though opportunities are emerging.

Markets

Australia exported an estimated 264,000 tonnes of used and processed tyres in 2023-24, with 212,000 tonnes exported for energy recovery.



The value of TDF

Processed used tyres (TDF) are most likely to be utilised as an ingredient in cement manufacturing and co-processed into the cement itself - *"Since all the components of the tyres are either destroyed, combined into the clinker or captured in the air pollution control device, there is no ash to dispose*[2]*."*

Cement manufacture is an energy intensive process and, to date, largely dependent on coal for heat. The TDF replaces this fossil fuel for heat, reducing greenhouse emissions, according to the latest Australian National Greenhouse and Energy Reporting (NGER) data below by between 30-40%.

[2] (https://www.sciencedirect.com/science/article/abs/pii/S0958946505000521)

Australian Government National Greenhouse and Energy Reporting scheme (NGERs) Schedule 1, Part 1 including 2022 Exposure Draft Amendment.

Item	Fuel combusted	Energy content factor: GJ/t	Emission factor: kg CO_2-e/GJ (Relevant oxidation factors incorporated)		
			CO_2	CH_4	N_2O
1	Bituminous coal	27.0	90.0	0.03	0.2
7a	Passenger car tyres, if recycled and combusted to produce heat or electricity	32	62.8	0.02	0.2
7b	Truck and off-road tyres, if recycled and combusted to produce heat or electricity	27.1	55.9	0.02	0.2

The chemical composition of TDF is similar to coal, including combustible components carbon, hydrogen, nitrogen and oxygen; as well as non-combustible components of TDF incl silica and iron.

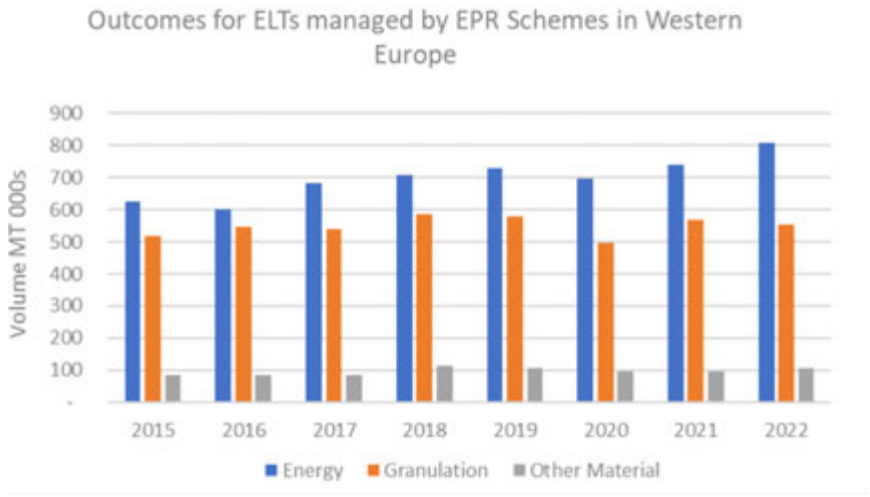
While TDF replaces fossil fuels to generate heat in cement manufacture, the material also contains, *'... desirable materials in the raw material mix for cement manufacturing*[3]

To date, Australia has been largely dependent on export markets for this material as cheap-coal has lowered the incentive for fuel substitution, though some domestic opportunities are now emerging.

Australia and Europe – A Market Comparison

The global used tyre market is dominated by rubber crumb and TDF, with some small-scale retread markets. There is though now a nascent industry, especially in India for the production of 'micronised rubber'[4], which is being utilised in the production of new tyres; and evolution in terms of pyrolysis and devulcanization that are worth continuing to observe.

As the following graph outlines, Europe, as in Australia, primarily converts used tyres to TDF, though has a larger split between TDF and rubber crumb than the Australian market.



[3] (https://www.climate-policy-watcher.org/scrap-tires/tire-and-tdf-use-in-portland-cement-kilns.html)
[4] https://www.atlantisrubberpowders.com/product

The point here being that Australia's market profile matches up with the rest of the developed world, i.e. there's nothing that Australia isn't doing that the rest of the world is.

A PC FOCUS ON OTR'S

As outlined, the passenger and commercial market demonstrate high rates of sustainability, collection and recovery and in line with global precedents. ATRA and its members remain vigilant in supporting regulators crack down on the small portion of non-compliant operators and waste generators.

There is however a clear market-failure when it comes to OTR tyre recovery that warrants some form of intervention. It is right, therefore, that the PC is focused on the OTR tyre sector as a key opportunity for increased recovery.

Issues The Pc Is Seeking Response To

The Productivity Commission has sought input regarding policy actions to increase the collection and recovery of Off The Road (OTR) tyres and the beneficial effects of such policies.

Specifically the PC is seeking input to the following questions:

- What are the environmental, economic and social impacts of unrecovered OTR tyres? What are the size of these impacts (including any data, if possible)?
- Which policy actions would be most effective in improving collection and recovery rates? What are the benefits to the community associated with these policies (including any data, if possible)?
- What are the costs and benefits of implementing and enforcing these policies (including quantitative analysis, where available)?
- What are the roles for different levels of government in implementing these measures?
- What are the ways in which governments can partner with Aboriginal and Torres Strait Islander communities on collection and recovery opportunities?
- What are the current levels of demand for products that can be produced from OTR tyres (including any data, if possible)? Are there any technical or regulatory barriers inhibiting their production or use?

Environmental, Economic and Social impacts of unrecovered OTR's?

As outlined above, collection and recovery levels of used OTR tyres in Australia are extremely low. The reasons for this are:

- Used OTR's and conveyor belts are generally permitted by state authorities to be buried on-site within the operators' state licence conditions
- Like the vast majority of other waste streams, used OTR tyre collection and recovery comes at a cost and if this can be avoided and within a permissive legal framework, it naturally will be
- A third, though spurious, factor sometimes put forward by some is there are insufficient collection and processing options/ facilities for the sector to utilise.

Avoiding the costs of sustainable disposal and recycling and the permitting of this by state regulators are the key reasons for Australia's low levels of OTR used tyres recovery.

As to the argument that there are few logistics and processing options for collection and recovery of OTRs, it's the reverse of the 'build it and they will come' maxim[5], and more aligned to 'if they come, we will build it'.

In the absence of a guaranteed supply of material, recyclers have been reluctant to invest too heavily in reprocessing infrastructure. That said, there are existing contracted arrangements for the removal of some OTR and conveyor belt material and these appear to be slowly developing. Demands from the community, traditional owners and a general 'social licence' and sustainability agenda within some of the large mining companies is shifting perspective and an appreciation of the need to remove this waste material from mining sites for secondary use.

But if Australia is to truly drive circular economy outcomes some form of regulatory intervention in the OTR tyre sector will be required.

Which policy actions will most support improved collection and recovery and what are the benefits stemming from these?

OTR arisings annually amount to around 130,000 tonnes and conveyor belt an additional 115,000 tonnes, totalling 245,000 tonnes of useful rubberised material being disposed of in-country annually. There are literally millions of tonnes of rubber material in the Australian landscape or buried below it with the source of this infill being the mining industry and to a lesser extent agriculture.

Around 70% of this material is disposed of in just two states, namely WA and QLD, and much more detail on the breakdown of these volumes can be found through this TSA Report, Tipping the Balance.

Voluntary action is improving but it may not be effective in increasing recycling levels of OTR tyres. The most obvious policy action that could change the current paradigm of on-site disposal of OTR's is a legislated requirement by states (and territories) for a phased-in ban of onsite/ in-pit disposal of waste tyres.

A mandated requirement to remove material from site will directly result in new business opportunities and investment into processing facilities by tyre recycling companies.

OTR tyres could also be captured in a material-specific regulated product stewardship model. This could include:

- an import levy
- licencing and audit regimes
- import data and collection/ recovery reconciliation against this
- infrastructure analysis and planning
- market development work and
- the application of an advanced disposal fee (ADF) to cover future collection and processing costs.

[5] Attributed to the Bible and Noah's Ark parable; or more mundanely the 1998 Field of Dreams film.

What costs and benefits flow from these policies?

The removal of used OTR tyres and conveyor belts from mine sites for reprocessing will, like the waste streams from most other sectors of the economy, cost the operator. A schedule of these likely costs is provided below from the TSA Tipping the Balance report.

Mine site	Lower		Upper		Comments
	$/unit	$/tonne	$/unit	$/tonne	
Regional	$1000	$333	$1800	$600	Collection costs vary by distance travelled. 'Regional' collections typically allow for up to 500kms from processor.
Remote	$1400	$467	$2300	$767	Collection costs vary by distance travelled. 'Remote' collections typically allow for up to 1,000kms from processor.

In addition to collection there are additional processing costs for this material. This may be up to $1000 per tonne if taken from site through to processing, transportation and to a high degree of refinement to say 30mesh.

The alternative to requiring mine operators to remove this significant waste stream and resource from the land and paying the costs of sustainable disposal/ resource recovery is to continue permitting on site dumping to occur. This approach simply avoids the inevitable, that at some stage it will be a requirement to remove all waste items from mine sites. Avoidance also undermines opportunities for the circular economy when it comes to used OTR tyres.

The benefits of increasing OTR tyre collection and recovery include:

- Significantly less detrimental impacts on the environment
- Increased availability to the recycling industry of rubberised material and the sale of this product for reprocessing
- Similarly, the payment of gate fees to collectors for appropriate collection and recovery and the associated industry development and economic outcomes
- Economic opportunities for indigenous communities engaging in these collection and recovery businesses (as many of these products are utilised in remote areas of Australia including on traditional lands under lease from the custodians)
- Removal of this material from site supporting a more thorough rehabilitation program for that country
- Availability of this material for processing including into Micronised Rubber for use in new tyres.

India is an extremely large producer of new tyres with over 200 million tyres manufactured in the country in 2023. At the same time, there is a growing awareness among tyre manufacturers of potential shortfalls in natural-rubber[6], and an agenda to find alternatives as well as obtain 'recycled' materials more generally for the production of new tyres[7]. This recycled content agenda is an extension of circular-economy policies and objectives seen in other products and with other manufacturers.

There is an emerging processing capacity in India for what's described as micronized rubber and a burgeoning demand for this material in the manufacture of new tyres (quantities and percentages of this material produced and able to be utilised in new tyres are a closely guarded secret). Used OTR tyres have the potential to be processed in the production of this material.

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[6] https://www.reuters.com/markets/commodities/global-rubber-shortfall-looms-2025-stagnant-output-association-says-2025-03-05/

[7] https://www.carsales.com.au/editorial/details/sustainable-tyres-and-what-theyre-made-of-142032/

Pyrolysis and to a lesser extent devulcanization have also been operational in non-OECD countries for many years. Evolving this technology into the developing world could be an important outlet for used OTR tyre recovery.

Roles for different levels of government

The critical tiers of government to engage in rectifying the currently unsustainable practice of on-site burial are State and Federal.

The development and implementation of a national product stewardship scheme for OTR tyres is most likely to be a **Federal government** responsibility; though the recent passing by the NSW parliament of state-based product stewardship legislation[8] (the product lifecycle responsibility act 2025), that allows that state to regulate any waste product, obviously means individual states may now act to impose additional regulations on the used OTR tyre sector.

It's possible additional states including WA and QLD could replicate this state-based approach to product stewardship and introduce their own legislation or scheme on OTR tyres. In which case one of these large-mining-states could enact some form of state-based product stewardship scheme.
However, it would be preferential for any such scheme to apply nationally.

More immediately, **states** that oversee mine licences could start to require tyre removal in licence conditions or could pass legislation banning the disposal onsite of used OTR tyres.

Role of traditional owners in increased OTR collection and recovery

There are obvious opportunities and an alignment of interests, for traditional owners to engage in the rehabilitation of country through the removal of OTR tyres from mining sites.

The business opportunities include collection operations, as well as storage and processing, whether stand-alone or in joint ventures with traditional collectors and recyclers.

As the value of a new mining tyre could be in the $100K range, there is already significant effort and associated businesses analysing mine tyre use and longevity, OTR tyre repair and other programs to extend OTR tyre life to its maximum[9].

OTR tyre wear and processes to maximise use is already a well-established business across the mining sector

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[8] https://www.parliament.nsw.gov.au/tp/files/190612/SPI%20-%20Product%20Lifecycle%20Responsibility%20Bill%202025.pdf

[9] An example of businesses engaged in tyre life extension services https://www.kaltiremining.com/en/?gad_source=1&gclid=Cj0KCQjw16O_BhDNARIsAC3i2GArVK9IbX9Bd9dlycKInzIXtbUzVJiHgCrj2SH8pmEzQ3dHMCUwjtAaAoNNEALw_wcB

Repair and maintenance of OTR tyres is an important feature of sustainable tyre life management; ultimately however an OTR tyre does reach its use-by-date and requires disposal. Removal from site is the starting point.

Markets for recovered OTR materials and technical and regulatory barriers to their uptake.

Markets for recovered material have always existed largely based upon fuel recovery (TDF) and rubber crumb.

There are, however, growing markets for micronised rubber and potentially recovered carbon and oil.

As mentioned above, tyre manufacturers are concerned with reduced supply of virgin rubber and alternate materials for new tyre production are under investigation, development and are already being utilised. Michelin for instance, is a leader in the utilisation of alternate materials in new tyre production.[10]

As tyres are no longer manufactured in Australia and the bulk of manufacturing occurs in our region in SE Asia including Malaysia, Thailand and India, Australia will rely on these markets to receive product. In many cases, it's likely most of the processing of recovered tyre and rubber materials will also be done in these locations, as the costs of production are likely to remain more competitive.

Domestic TDF consumption is beginning to emerge, although Australia is likely to remain dependent on export markets for some time. There are no particular regulatory impediments to use of this material; the challenge for uptake has largely been cheap-coal as a competitor.

Domestic rubber crumb demand however remains fairly flat, despite market and regulator interest in further uptake. But in this case a range of commercial and technical issues have, to-date, stymied significant uptick in demand. All of these are fixable.

[10] https://www.michelin.com.au/auto/advice/change-tyres/car-tyre-recycling

The total approximate capacity for crumb rubber in asphalt is around 200,000 tonne p.a. though current demand is only around 40,000tonne p.a[11]. Specifying CRA into roads and as an alternate virgin polymer binder would increase demand for this material and barriers can readily be overcome, as detailed in the TSA paper examining these[12].

Government procurement targets and other mechanisms (such as road construction tender requirements for crumb rubber asphalt) could greatly bolster further demand for this material.

For additional information: Robert Kelman, Executive Officer, Australian Tyre Recyclers Association (ATRA),

[11] Industry sources
[12] https://www.tyrestewardship.org.au/wp-content/uploads/2024/10/TSA-Crumb-Rubber-Roads-Fact-Sheet.pdf