TSA Driving sustainable outcomes for end-of-life tyres

TyreStewardship AUSTRALIA

TYRE RECYCLING IN THE NORTHERN TERRITORY

A business case for increased recovery through a local solution

Australian Government Accredited Product Stewardship Scheme

Tyre Recycling in the Northern Territory

Version 2.0

December 2023

This report has been revised to reflect available data and information and replaces previous versions.

The information in this report has been gathered through a research and consultation process by TSA in partnership with the NT government, Local Government Association of NT, local government, industry associations, resource recovery sector participants and community members.

All care has been taken to ensure accuracy and give a true reflection of the NT tyre recovery market. However, the report is provided for guidance only and it is incumbent on interested parties to undertake their own further due diligence when making investment and policy decisions.

All information in this report is extracted from a more comprehensive assessment of the NT tyre recovery. Please contact TSA at getonboard@tyrestewardship.org.au for a copy of the full report.

Disclaimer

TyreStewardship AUSTRALIA

Contents

Acronyms

Acronym	Description
AEPD	Australian EPD programme
ARENA	Australian Renewable Energy Agency
DGA	Dense graded asphalt
EOLT	End-of-life tyres
EPA	Environmental Protection Agency
EPD	Environmental product declaration
GGA	Gap graded asphalt
GHG	Greenhouse gas
GWP	Global warming potential
ISO	International Standards Organisation
LCA	Life cycle assessment
LCI	Life cycle inventory
OGA	Open graded asphalt
OTR	Off-the-road tyres
PMB	Polymer modified binder
TDF	Tyre-derived fuel
TDP	Tyre-derived products
TSA	Tyre Stewardship Australia
UOM	Unit of measurement

Glossary

Biogenic
Anything produced by or made of living organisms.

Crumb
A refined rubber product, typically less than 1 mm in diameter, made from recycled tyres.

Disposal
The dumping, landfilling, direct incineration, unsustainable burning, and stockpiling as an end point of used tyres.

Dense/Open/Gap graded asphalt
Asphalt grades with variations in make-up, such as air voids, aggregate size and density, to suit different road requirements.

End-market
The end destination for a product, in this case a tyre-derived product

End-of-life tyre
A tyre that is deemed no longer capable of performing the function for which it was originally made.

End-user
A person or organisation that uses or consumes a product or service, in this case purchasing and using tyre derived products.

Energy recovery
The use of used tyres in a thermal process to recover energy for heat generation or industrial processes.

Environmental Impact Categories
An impact category groups different emissions into one effect on the environment. By converting those emissions into one unit, this translates into one impact category.

Environmental Product Declaration
A standardised and verified document that provides transparent and scientifically sound information about the environmental performance of a product or system over its entire life cycle.

Fossil-based/Fossil-derived
Materials formed from hydrocarbon compounds created from the remains of plant and animal life in Earth's geological past.

Granule
A refined rubber product, typically 2 mm – 15 mm, made from recycled tyres.

In-use
Tyres that are being used for the purpose for which they were originally made.

Life cycle assessment
A methodology for quantifying the environmental impacts of a product or service over the course of its entire life.

Recovery
Used tyres that are collected and either reused, recycled or repurposed either in Australia, or overseas.

Shred
A processed rubber product, less than 150 mm (typically 50-80 mm), made from recycled tyres.

Tyre-derived fuel
A fuel derived from end-of-life tyres and includes whole and shredded tyres used for this purpose.

Tyre-derived product (also Tyre-derived material)
Any product produced from rubber, steel, textile or other material recovered from recycling end-of-life tyre.

Tyre recycler
A business that conducts tyre processing, recovering rubber, steel, textile and/or other materials and processing it into a form whereby it can be used as an intermediate product in the manufacture of a product, or to recover as energy.

Tyre Stewardship Australia
The entity created to administer The Tyre Product Stewardship Scheme.

Tyre collector
An individual or business that collects and/or transports used tyres in any part of Australia. This includes transporters, balers, local waste facility, auto parts recyclers.

An opportunity that requires a collective effort 1

Only 51% of used tyres were recovered for recycling in the Northern Territory in 2019-20, all of which was recovered via transport to surrounding states.

This means no used tyres were recovered and converted into tyre derived products within the Territory while 1,775 tonnes of material was landfilled, stockpiled, illegally dumped or buried onsite.

This business case shows there is potential for establishing a local processing facility producing tyre derived products that can be utilised within the NT. A new local facility would reduce reliance on interstate transport and keep ownership of valuable materials however would require the collective effort of government and industry to overcome the unique challenges the Territory faces.

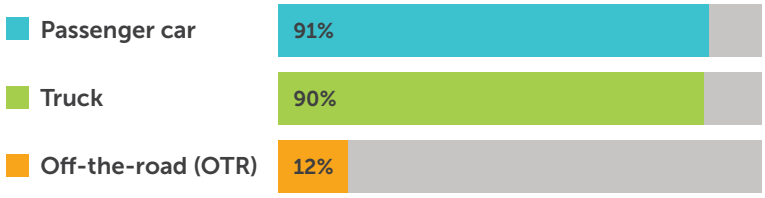
Government would need to better regulate the disposal of used passenger car and truck tyres. Recycling can compete with landfill on price. But it can't compete with illegal dumping and unmanaged stockpiling. Concerted efforts are required to ensure better regulation and consistent procurement practices to both increase the volume of material available for recycling, and to give commercial operators confidence that they won't be 'undercut' by rogue practices.

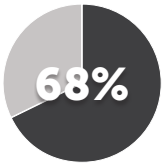
Government and industry would need to consider existing and future mining operations as a supplementary source of used tyres. This would require a significant departure from the existing and legal practice of burying used tyres on site. However, progress is being made in this regard by leading off the road (OTR) tyre importers that have voluntarily committed to contribute to TSA to lead recovery efforts in this sector. Additional support from forward thinking mining companies, communities and the Australian federal government will soon enable improved recovery in this sector.

And if a new, local recycling industry is to be developed, a full and comprehensive approach will be necessary to attract a commercial operator to a small and widely dispersed market. This would include government needing to help create end markets through its own procurement and curtailing practices that allow large tyres to be buried in pit. In particular, government would need to specify the use of recycled rubber materials in road construction and other public works.

National and NT recovery rates for used tyres (2019-20)

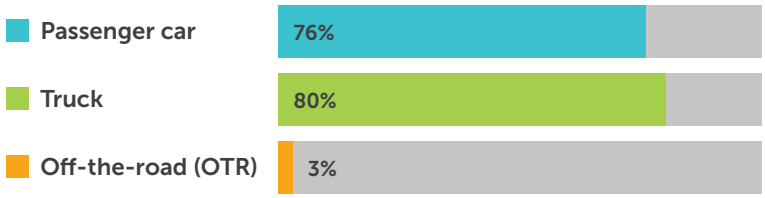
National tyre recovery rate

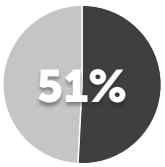




National recovery rate

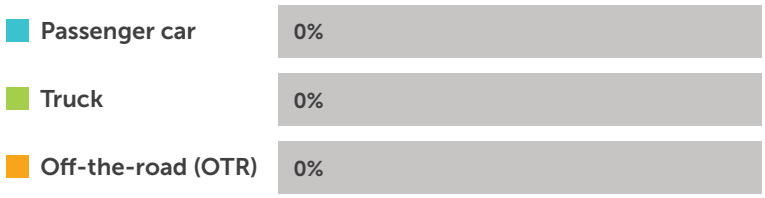
NT recovery rate





NT recovery rate

NT local recovery rate



NT local recovery rate

Note: Recovery in following financial years increased following significant uptake in interstate recycling, before dropping back to similar levels in the 2022-23 financial year

Fate of Used Tyres in the NT (2019-20)

	Recovery: Tyre type (tonnes per year)			Total
	Passenger	Truck	OTR	
Recovered via Transport to Other States	650	1,200	50	**1,900**
Recovered in NT	0	0	0	**0**
Landfilled, stockpiled, illegally dumped or buried onsite	200	300	1,275	**1,775**
Total	**850**	**1,500**	**1,325**	**3,675**

Why recycle tyres? 2

There are a range of environmental and economic benefits that increased tyre recycling can bring to the Territory.

Environmental benefits 2.1

The environmental benefits of tyre recycling are well established, and include:

- Recovery of resources that would otherwise be lost.
- Reduced demand for landfill space.
- Reduced exposure to harms caused by illegal dumping and stockpiling, including reduced fire hazard and increased visual amenity.

Increased tyre recycling in the Territory also offers the opportunity to 'Care for Country' through better custodianship of traditionally-owned land that has been leased to mining companies.

A completely local tyre recycling supply chain based upon a 74% recycling rate could provide:

- 30 direct and ongoing full time jobs.
- The recovery of around $2.1m worth of resources annually.
- Up to $6m of capital investment in new recycling facilities.

National Waste Policy

The National Waste Policy Action Plan sets the goal of an 80% recovery rate across all waste streams by 2030.

Recent reforms to the regulation of product stewardship encourage companies to take greater responsibility for the waste they generate. The Commonwealth Government has made it clear that where voluntary product stewardship schemes are not effective, it has tools to intervene and regulate. TSA's National Tyre Product Stewardship Scheme is voluntary. But TSA believes all tyre importers – big and small – should contribute and play a part in finding viable solutions.

Diversity of materials

2.2

Different recycled materials are recovered from different types of tyres for use in different end markets.

Material	Source	Indicative value (per tonne)
Crumb rubber: Fine particles (1mm or less) used predominately in road construction as a substitute for polymer binder.	Truck tyres and OTR tyres because of their high concentration of natural rubber.	$900
Rubber granules: Courser particles used in low impact and permeable pavements.	Mostly passenger car tyres.	$600
Tyre Derived Fuel: Shredded tyres used in cement kilns, boilers and other thermal applications. Also whole baled tyres exported for similar applications.	Mostly passenger car tyres.	$13*
Steel: Separated during the recovery of crumb rubber and rubber granules.	All tyres.	$155

* Denotes the market price of TDF at the time of undertaking research. Please note, the price of TDF is one of the most variable of all recovered tyre derived products and is closely aligned to the price of coal. As such, consideration of this should be make when making all business modelling and market assessment decisions.

What, where and how many tyres are there? 3

Understanding the viability of tyre recycling in the Territory requires understanding the volume, location and type of used tyres available for recovery.

All of these factors impact upon the recovery costs, the suitability of recovered material for different end markets, and the scale of commercial operation necessary to recover meaningful volumes of tyres. This business case has made an approximation of where, how much and what sort of used tyres there are in the Territory.

Location, volume and type of used tyres in the Territory 3.1

Passenger car and truck tyres per year (tonnes)

Regional centre	Passenger car (tonnes)			Truck (tonnes)		
	Urban area	Surrounding remote areas	Total	Urban area	Surrounding remote areas	Total
Darwin	540	130	**670**	950	220	**1,170**
Katherine	0	60	**60**	10	100	**110**
Tennant Creek	20	40	**60**	40	80	**120**
Alice Springs	40	40	**80**	70	60	**130**

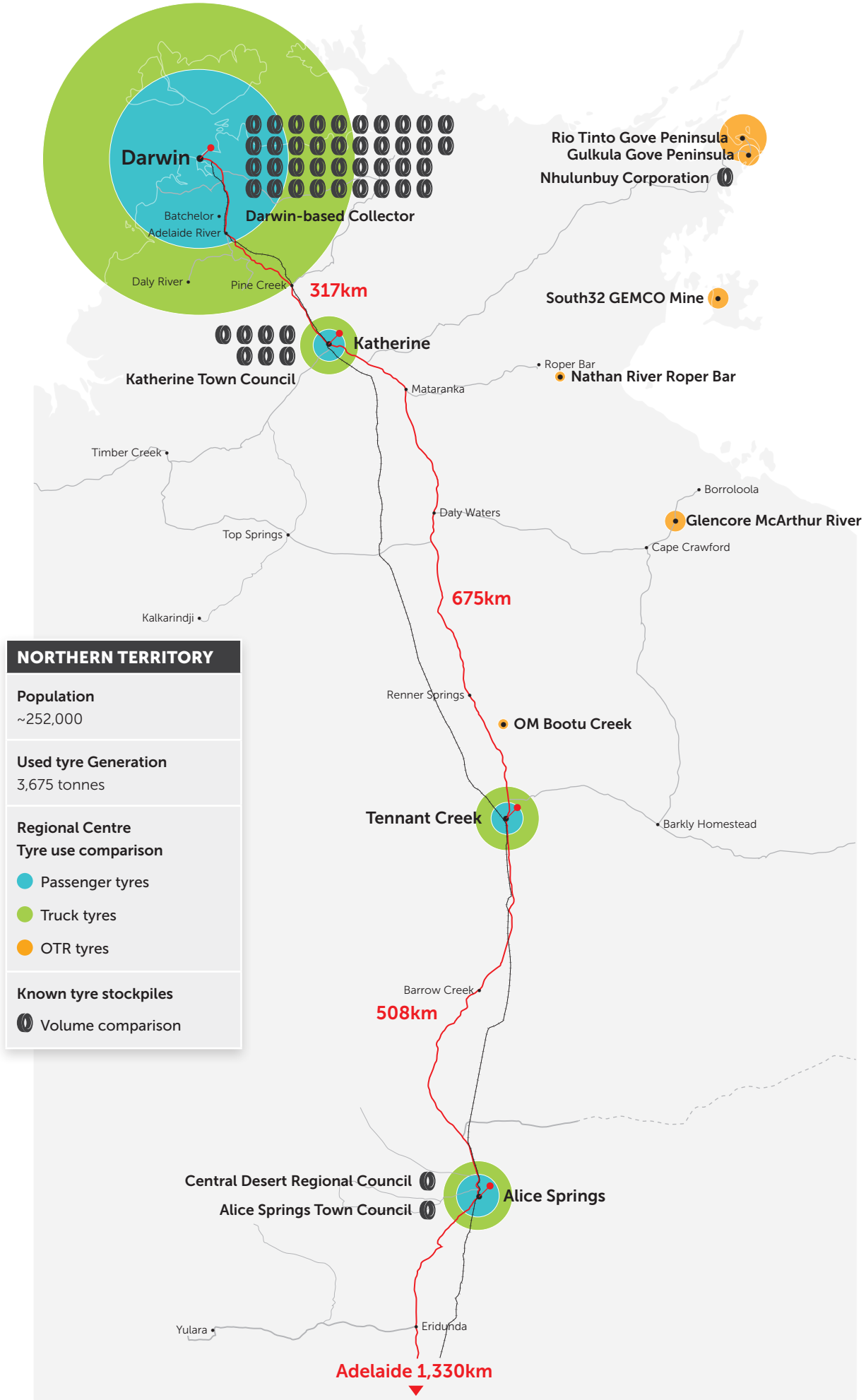
OTR tyres from selected mining sites per year (tonnes)

Operation	OTR (tonnes)
Rio Tinto Gove Peninsula – 730 km NE of Katherine	600 to 900 tonnes
Gulkula Gove Peninsula – 730 km NE of Katherine	25 to 37.5 tonnes
Glencore McArthur River – 598 km SE of Katherine	275 to 412.5 tonnes
OM Bootu Creek – 129 km N of Tennant Creek	90 to 135 tonnes
South32 GEMCO Mine – Groote Eylandt	290 to 435 tonnes
Nathan River Roper Bar – 374 km E of Katherine	110 to 165 tonnes

Note: Updated information on mining tyre generation can be found in TSA's "Tipping the Balance" report

Known stockpiles: Total estimated volumes

Responsible party	Estimates size
Katherine Town Council	700 tonnes
Nhulunbuy Corporation	60 tonnes
Central Desert Regional Council	105 tonnes
Alice Springs Town Council	100+ tonnes
Darwin-based collector	6,000+ tonnes
Total known:	**7,000 tonnes**


Darwin
Batchelor
Adelaide River
Daly River
Pine Creek
Darwin-based Collector
317km
Katherine
Katherine Town Council
Rio Tinto Gove Peninsula
Gulkula Gove Peninsula
Nhulunbuy Corporation
South32 GEMCO Mine
Roper Bar
Nathan River Roper Bar
Mataranka
Timber Creek
Borroloola
Daly Waters
Glencore McArthur River
Top Springs
Cape Crawford
675km
Kalkarindji
NORTHERN TERRITORY
Population
~252,000
Used tyre Generation
3,675 tonnes
Regional Centre
Tyre use comparison
Passenger tyres
Truck tyres
OTR tyres
Known tyre stockpiles
Volume comparison
Renner Springs
OM Bootu Creek
Tennant Creek
Barkly Homestead
Barrow Creek
508km
Central Desert Regional Council
Alice Springs Town Council
Alice Springs
Yulara
Eridunda
Adelaide 1,330km

The potential for increased recovery rates

3.2

Tyre recovery is not a straightforward proposition in the Territory. The Territory's relatively small population and vast distances present unique challenges for increased local tyre recycling, but also some unique opportunities.

Other features specific to the Territory that need to be considered include:

- Limited historic investment in purpose-built tyre recycling infrastructure.
- Lack of volume density to create the critical mass of supply to underpin investment.
- Significant challenges in applying and enforcing regulations against illegal disposal and stockpiling.
- Relatively limited local and regional public resources.
- Local and regional councils are already separating and storing waste tyres.
- Significant and growing annual volumes of mining vehicle tyres that are yet to have appropriate recovery options.

Taking all this into account, this business case identified the following local recovery rates as being achievable, but only if a coordinated range of measures to achieve increased local tyre recycling are implemented.

Indicative local recycling potential

Catchment	Tyre type	Volume recovered locally (tonnes p/a)	Local recovery rate
Darwin & surrounding areas	Passenger car & truck	1,340	90%
Townships along Adelaide-Darwin corridor	Passenger car & truck	160	90%
Remote communities	Passenger car & truck	440	60%
Abandoned & dumped tyres	Passenger car & truck	350	50%
Mining operations	OTR	1,200	75%
Total		**3,490**	**74%**

Note: Recycling potential shown above differs from numbers presented elsewhere in this report. Figures presented was estimated using a bottom-up approach, with estimates based on TSA data, stakeholder engagement and correlation between OTR vehicle tyre arisings and mining activity.

Option for increased used tyre recovery through a local used tyre recycling facility

4

This business case explored the option to achieve a high level of used tyre recovery through investment in new reprocessing facilities in the Territory.

Local recycling

4.1

A local recycling option was modelled on the basis of a new commercial scale tyre recycling facility in Tennant Creek or Katherine, along with one or more facilities located close to mining sites to pre-process off-the-road tyres.

These proposed locations are driven by a need to keep freight costs down, to ensure equitable access to tyre recycling services, and to position the facility to best service local end markets. These options are proposed to demonstrate that while investment in local recovery poses risks, modelling can also be utilised to represent differing cost effective recovery options in the Territory.

This option assumes passenger car tyres are reprocessed into steel and crumb rubber or rubber granule, and truck tyres and off-the-road tyres to be reprocessed into steel and crumb rubber. While this approach is more costly for passenger car tyres than tyre derived fuel, it allows for a range of higher value applications in the Territory. Further, modern integrated facilities are understood to be able to switch between passenger car, truck and off-the-road tyres as feedstock.

The principal challenge for a local reprocessing solution is that end markets for rubber granule and crumb rubber are yet to be established in the Territory.

The viability of a local reprocessing solution may also depend upon a significant change in the management of used off-the-road tyres at mine sites. Recovery of mining vehicle tyres may be essential for a local operator to reach a throughput of 3,500t p/a necessary to support their investment. In the absence of such changes, a throughput of 2,000t p/a may still provide sufficient utilisation to support establishing a local facility, although the rate of return would be significantly less.

Despite all this, the local option holds out the prospect of superior benefits to the Territory compared with interstate recycling, due to the economic benefits and positive spill overs for the local community.

Advantages and disadvantages of local recycling facilities compared with interstate recycling:

Advantages

- Freight costs are much lower, except for tyres from Alice Springs.
- Locally produced products could command higher prices due to reduced competition.
- Opportunity to use more versatile new technology.
- Create higher value, localised recovery options
- Substantial local economic benefits which may foster market acceptance and participation, particularly among mining companies.

Disadvantages

- Local markets and supply chains are not established which presents a high degree of risk for commercial operators, particularly during the establishment phase.
- The regulatory environment is not established which creates a risk for commercial operators.
- Low return on investment in the short term which may require additional short term procurement or investment support.

Comparison to interstate recycling 4.2

Interstate recycling was modelled on the rail transport of whole passenger car tyres to Adelaide where they are shredded and exported for use as tyre derived fuel in kilns, boilers, and furnaces. Whole truck tyres and sectioned off-the-road tyres are sent to the eastern states where they are made into crumb rubber and steel is separated out.

Interstate end markets are well established and customer demand is reliable. As such, interstate recycling is less dependent on supply chain support. However, the current high cost of international shipping presents a problem for the export of tyre derived fuel such that the sale price may not fully cover shipping costs.

It should be noted that as markets continue to fluctuate with the Ban on waste tyre exports and supply chain issues because of COVID, past pricing models may need to be abandoned or modified to consider current and future market changes. What has been considered standard costs in the past may no longer be a true reflection of current and future recovery costs in the Territory.

Advantages and disadvantages of interstate recycling facilities compared with local recycling:

Advantages

- Does not require a minimum volume as it utilises existing processing facilities.
- Established end markets and supply chains allow for immediate offloading of product.
- Facilities are operating within an established regulatory framework.

Disadvantages

- Exposed to high freight costs due to long travel distances.
- Competition in end markets places downward pressure on recycling material.
- Exposed to international shipping costs and foreign country trade policy risks.
- Of more limited economic value to the Territory than local recovery.

Assumed Local Recovery Volume & Comparison

	Recovery: Tyre type (tonnes)			End markets: Material type (tonnes)			
Option	Passenger	Truck	OTR	TDF	Crumb rubber	Rubber granule	Steel
Assumed local recycling	830	1,460	1,200	0	1,730	660	1,100
Comparative interstate recycling	830	1,460	1,200	830	1,730	0	930

Preliminary assumptions underpinning the business case for a local recycling facility

Specifications		
Facilities	• Main facility located in Tennant Creek, capable of processing 3,500 tonnes p/a of passenger car, truck, and pre-processed OTR vehicle tyres. • OTR vehicle tyre pre-processing facility based in Katherine.	
Core products	• Steel, rubber granule, crumb rubber.	
Operating ramp up	• Year 1 – 33% of assumed throughput reached. • Year 2 – 66% of assumed throughput reached. • Year 3 – 100% of assumed throughput reached.	
Business expenses		
Upfront capital	• $4,000,000 main facility + $1,500,000 OTR pre-processing facility.	
Processing costs	• $400/t processed for all tyre types. • $400/t additional for OTR vehicle tyres only.	
Freight costs	• $62/t (by rail), volume-weighted average across Darwin, Katherine (including OTR vehicle tyres), Alice Springs & Tennant Creek. • $400/t additional (by road) for OTR vehicle tyres (to Katherine).	
Other business costs	• $100,000 p/a administration overheads. • $125,000 p/a business development activities.	
Business revenues		
Sale price of material	• Steel – $155/t • Granule – $600/t • Crumb rubber – $900/t	
Annual throughput	**At 2,000t p/a:** • Passenger car – 480 t • Truck – 840 t • OTR vehicle – 690 t	At 3,500t p/a: Passenger car – 830 t Truck – 1,460 t OTR vehicle – 1,200 t
Gate fees	• $500/t (equivalent to $4 per passenger unit).	
OTR processing surcharge	• $1,100/t additional for OTR vehicle tyres only.	

Why not Darwin?

4.3

Darwin might seem like the logical place to locate a central tyre recycling facility in the Territory and further exploration of this option is welcomed by interested parties.

But Darwin presents some impediments that make it challenging to be a suitable location. In particular, northbound freight costs are much higher than southbound freight costs. This means it is unlikely to be economical for tyres from Tennant Creek, Alice Springs, many remote communities and mining sites to be transported to Darwin.

With a smaller pool of used tyres available, a recycling operator would need to charge higher recycling fees to cover their costs, which would erode the transport savings achieved through having a central recycling facility located at the point where the largest amount of tyres reach end-of-life.

Tennant Creek or Katherine is considered more suitable as it would allow a greater range of tyre generators to have access to the facility. This would allow the operator to spread capital costs over a large volume of feedstock.

Tennant Creek and Katherine would also be centrally located to many end markets across the Territory, particularly road construction. Further, the transport of reprocessed material to Darwin is more commercially viable than the transport of unprocessed waste tyres to Darwin as reprocessed material can be more densely packed, thus reducing freight costs.

Comparison of the local recycling compared to current use of interstate recycling

5

Net value of material recovered using mid-range price points

Option		Tyre derived fuel	Crumb rubber	Rubber granule	Steel*	Total
Assumed local recycling	Material value (inclusive of freight costs)	–	$1,557,000	$396,000	$170,500	$2,124,000
	Processing costs	–	-$1,211,000	-$462,000	–	-$1,673,000
	Net value	**–**	**$346,000**	**-$66,000**	**$170,500**	**$451,000**
Comparative interstate recycling	Material value (inclusive of freight costs)	$10,400	$1,211,000	–	$144,100	$1,366,000
	Processing costs	-$74,700	-$865,000	–	–	-$940,000
	Net value	**-$64,300**	**$346,000**	**–**	**$144,100**	**$426,000**

* The processing costs associated with removing steel from used tyres are embedded in the primary processing costs.

Recycling fees

5.1

Recycling fees are needed to ensure the viability of recycling operations when the market price of recovered commodities does not cover the cost of collection and reprocessing. As can be observed from this business case, the margin between the value of material generated, and the cost of transport and reprocessing is not large. Given all of the uncertainties inherent to the recycling industry, and the need to establish in a new market, recycling fees are necessary to support any significant increase in recycling in the Territory.

These recycling fees will need to fall within the waste market's price tolerances in order for the operator to have a viable business model, noting that policy and regulation can have a positive influence on these tolerances. The business case has estimated the following range recycling fees that would need to be charged by commercial operators to establish a viable business.

These ranges in gate fees factor in a level of uncertainty in business costs and revenues as well as the variation in freight costs due to collection from across the Territory (i.e. lower freight costs for sources close to or north of the facility, higher for southern and more distant sources).

Estimated recycling fees to support local recycling

Option	Passenger car	Truck	OTR
Local recycling fee	$270 to $620/t	$60 to $600/t	$1160 to $1,700/t
Fee for increased interstate recycling	$420 to $550/t	$360 to $830/t	$1,460 to $1,930/t

Potential end markets in the Territory

6

If a local tyre recycling facility is to be established in the Territory there must be adequate demand from one or more end markets.

Existing demand for recycled tyre products in the Territory is largely limited to smaller garden beds, sidings on bike tracks, and other niche applications. These end markets are not especially scalable and do not provide returns that would support a commercial reprocessing operation.

New end markets in the Territory are needed to purchase material that is reprocessed in the Territory. This would provide the twin benefits of avoiding higher freight costs and retaining economic activity within the Territory.

This section highlights potential new market areas of particular relevance to the Territory. Further case studies and information can be found on the $8 million TSA has contributed to new and expanded markets at the TSA website: www.tyrestewardship.org.au/innovation/case-studies/

Road construction:

At present, Northern Territory road authorities do not use crumb rubber in road construction.

This business case identified a potential end market of up to 2,100 tonnes of rubber crumb for use in asphalt or spray seal in the Territory each year based on current bituminous product demand. While good potential demand may be realised in this market and barriers to consumption can be addressed, there are many steps required to establish road manufacturing practices that make crumb rubber use standard in the territory to realise these potential volumes.

Permeable pavements:

Permeable pavement made with up to 50% rubber granule has been shown to resist cracking and improve water permeability.

These features may be particularly suited to the Territory's tropical zones where flooding and erosion risks are high. This business case estimated that Darwin alone could demand of 1,100 tonnes of rubber granules annually. 1,400 tonnes of passenger car tyres would be required to generate this amount of recycled material which is more than has been generated in any of the last 5 years.

Defence infrastructure:

Defence and related industries are a large part of the Territory economy. Potential end markets for recycled tyre products for use in Defence infrastructure include:

- Crumb rubber in internal road, driveway and carpark construction.
- Civil applications, including temporary road barriers, traffic management devices, bunds and other spill management and flood prevention equipment.
- Specialised rubber containing materials for defence applications, including blast and ballistic proof panels, and sprayable composites.

How to make it happen

7

Increased tyre recycling in the Territory will require a collective effort by multiple stakeholders that contribute to and enable an efficiently functioning market.

Government must regulate disposal and procure end products to support industry, while industry leaders need to be flexible and innovative to capitalise on any emerging opportunities. The business case identifies the following interventions necessary to implement this collective approach.

Intervention		Key features
Interventions targeting demand for tyre recovery services	NT EPA to update and modernise its regulatory framework & enforcement tools for the disposal and management of waste passenger car and truck tyres	• Regulatory framework sets out and clearly communicates what constitutes legal management of waste tyres, and is integrated with voluntary measures to improve and support efficient compliance. • Updated and efficient surveillance tools (i.e. electronic/digital tracking tools, geospatial monitoring / remote sensing, and analytics to locate dumped tyres) coupled to consistent enforcement. • Development and use of a clear regulatory strategy to correct for exploitation of remote unlicensed landfills by outside parties seeking to avoid disposal fees. • Campaign to communicate updated regulatory approach and practices. • Periodic review of regulatory settings to account for a maturing tyre recycling market and the opportunity to raise management standards.
	NT Government to develop and adopt a strategic approach to fund and coordinate the recycling of accumulated stockpiles, working with Commonwealth Government and TSA as product stewardship and circular economy partners	• Account for the scale, location, ownership or duty holder status, risks posed by, and cost to recover large tyre stockpiles. • Assign and lock in responsibility to plan for and manage each stockpile within a permitted set of options and timeframes. • Review the tyre recycling sector's capacity to manage stockpile volumes in an orderly and timely manner. • Address funding gaps that may otherwise stall the removal and safe management of tyre stockpiles. • Review the extent that stockpiles are still being accumulated over longer timeframes and explore the need for further action.
	TSA and LGANT to promote and guide the procurement of suitable passenger car and truck tyre collection and recycling services available across the Territory	• Publication and promotion of services available to each region in the Territory. • Preparation of guidance for councils and tyre retailers to engage on, explore, and procure legitimate tyre collection and recycling services. • Use of grouped procurement for tyre recycling to aggregate demand. • Piloting of efficient transport models and services for remote communities.

Intervention		Key features
Interventions targeting demand for tyre recovery services *(continued)*	TSA to undertake a targeted business case to establish a viable model for OTR vehicle tyre recycling, including engagement across potential service partners and the mining industry	• Business case to confirm feasibility of OTR vehicle tyre recycling in the Territory, exploring a range of potential solutions and collaboration models (e.g. with traditional owner groups), mapping key steps to implement, and clarifying interactions with the regulatory framework.
	TSA to drive collaboration and investment in OTR vehicle tyre recycling services as informed by the business case	• Planning for and delivery of actions, including direct investment in infrastructure, cross-sectoral engagement and coordination, and/or market development as informed by the business case.
	NT EPA and DEPWS to update the regulatory framework for managing OTR vehicle tyres, working with mining industry and tyre recycling sector stakeholders, and other sectors that need to comply in managing end of life OTR vehicle tyres	• As informed by the TSA business case and engagement with industry stakeholders, measures used to regulate and/or set standards for the management of OTR vehicle tyres will be updated in a way that allows for timely and orderly compliance.
Interventions to support investment across the supply chain	The advantages of investing in tyre recovery are promoted services in the Territory (with TSA support)	Promotion of advantages unique to the Territory: • Opportunity for niche recyclers looking to establish a viable medium scale business model that may be rolled out elsewhere. • Relative protection from interstate competitors (for recycling services and end markets) based on distances. • Opportunity to establish OTR vehicle tyre recovery services ahead of planned expansion of mining activity and end market infrastructure investments in the Territory. • Opportunity to position for a circular economy partnership with Defence as a potential OTR vehicle tyre source and recycled tyre end customer. • Coordinated and strategic approach to creating a favourable market environment and building out supply chains, as informed by this business case.

Intervention		Key features
Interventions to support investment across the supply chain *(continued)*	Pending further feedback from the tyre recycling sector, TSA and NT Government to consider options to directly invest in processing capacity, based on strategic value and public benefits	• Investigate whether there is a persistent failure in private investment which triggers the case to allocate funds based on the capture of positive spill over. • Any capital allocation will need to attach terms so that TSA and NT Government can be confident in and track the public returns of their investment.
	TSA to promote and potentially support opportunities for downstream manufacturers, suppliers and service providers to integrate with the tyre recovery supply chain	• TSA to engage with supply chain partners (e.g. road building teams, civil engineering firms, technology proponents) to flag commercial opportunities in the Territory, and broker between end markets, supply chain partners and tyre recyclers. • TSA to potentially provide capital funding if and where this brings forward a full complement of supply chain actors ready to serve end markets in the NT.
Interventions to address end market uncertainty	TSA to undertake market development (with NT Government, LGANT and industry partners as relevant), drawing on its established methods.	• Engage with NT DIPL and related technical and procurement teams. • Engage with local and regional councils' engineering and procurement teams. • Engage with private developers (as relevant). • Engage with Commonwealth Department of Defence leaders based in the NT and/or responsible for sustainability, procurement, land vehicle management, and infrastructure projects.
	TSA to facilitate NT stakeholder involvement to draft and finalise coordinated implementation plan of phased actions to achieve recovery outcomes in the Territory.	• Engage with the tyre recovery industry on investment dependencies, noting the option for a niche business model. • Organise implementation to an agreed timeline. • Improve transparency and information sharing for increased certainty around coordinated actions, and lesson capture. • Coordinated and targeted engagement with the market to improve confidence and leverage private sector investment into recovery and product development.
Enhanced product stewardship		• Should the challenges of tyre recovery in the Territory fail to be overcome via mechanisms currently available, TSA to work with the Federal government and NT stakeholders to assess enhanced Product Stewardship options to support better regional and remote tyre recovery.

TyreStewardship AUSTRALIA

Australian Government Accredited Product Stewardship Scheme

TSA0324/04.2024