

Waste Tyre Management in South Africa

Update 2023

Disclaimer: This Report has been prepared by REDISA. The factual data on which it is based is drawn from REDISA's audited records and from data published by the DEA/DFFE. Supporting documents are appended.

Executive Summary

We discuss in this Report the context, opportunities, history, and status quo of waste tyre management in South Africa.

South Africa has 38 waste streams. In the nearly 25 years since the National Environmental Management Act 107 of 1998, we have succeeded in establishing only one Industry Waste Management Plan, the Industry Waste Tyre Management Plan (IndWTMP) known as the REDISA Plan.

The REDISA plan was gazetted in November 2012, commenced operations in February 2013, flourished for three years, and was illegally destroyed in 2017. The motivations for its destruction are perhaps of historic value, but the important issues are what happened next, and what will happen in the future.

The Waste Management Bureau (WMB) was established under a 2014 amendment to the National Environmental Management: Waste Act 59 of 2008 (NEMWA) as an agency with the then DEA. Its objects were defined to be primarily creating, monitoring, and supporting industry waste management plans (Section 34D). When REDISA was shut down, it was thrust into a caretaker role to take on the operations of the IndWTMP. It is common cause that this has not been a success. The state of waste tyre management has deteriorated dramatically. This is due in large part to the inherent difficulty of a government agency dealing with operational matters in a complex and changing environment with an inadequate budget and under the constraints of the Public Finance Management Act (PFMA). Even "known unknowns" like wildly variable fuel prices are problematic: a contract under the PFMA needs to be drafted with great care and foresight if it is to cater for such circumstances. By their own admission the Waste Management Bureau has not been successful in this respect, at least regarding depot operations¹.

In the meantime, the DEA/DFFE have been attempting to have a new IndWTMP developed. Calls to industry to submit plans were unsuccessful, so the CSIR was commissioned to draft a new plan. The first publicly available draft of that plan was released in March 2020. Draft 9 was published two years later in March 2022, and a later draft published for comment as a gazetted IndWTMP in December 2022. The gazetted draft has many flaws at the technical level of whether it is even possible to qualify as legislation, and strategic flaws that would ensure that even if the technical errors were resolved any plan operating under its parameters would be certain to fail.

¹ GG 47670, IndWTMP gazetted 7 December 2022, item 2.5.5

Glossary

CE	Circular Economy
CSIR	Council for Scientific and Industrial Research
DEA	Department of Environmental Affairs (now DFFE)
DFFE	Department of Forestry, Fisheries and the Environment (previously DEA)
Department	The DEA/DFFE
EPR	Extended Producer Responsibility
EPRO	Extended Producer Responsibility Organisation
ER	Environmental Rating
IndWTMP	Industry Waste Tyre Management Plan
NEMA	National Environmental Management Act 107 of 1998
NEMWA	National Environmental Management: Waste Act 59 of 2008
NPS	National Pricing Strategy
OTR	Off The Road
PTI	Product Testing Institute NPC
REDISA	Recycling and Economic Development Initiative of South Africa NPC
SCA	Supreme Court of Appeal of South Africa
WMB	Waste Management Bureau
WTR	Waste Tyre Regulations (2017 unless qualified with a year)

Contents

1	Introduction	4
2	Context.....	4
2.1	Legislative Environment.....	4
2.2	Changes to Legislation	5
2.3	Attacks on REDISA.....	6
3	Principles of Waste Stream Management	7
3.1	The Circular Economy	7
3.2	An Economic Opportunity.....	8
3.3	Closing the Waste Tyre Loop	8
3.3.1	Design.....	8
3.3.2	Reverse Logistics	9
3.4	The Right Incentives.....	10
3.5	Path Dependency.....	11
4	The REDISA Plan	11
4.1	Inception	11
4.2	The Single Plan.....	12
4.3	Industry Independence.....	13
4.4	Funding	13
4.5	Socio-Economic Goals.....	14
4.6	Long Term Vision.....	15
4.6.1	Norms and Standards.....	15
4.6.2	Environmental Rating.....	15
4.6.3	Sustainability Accounting.....	16
4.7	The Product Testing Institute.....	16
4.8	REDISA’s Achievements	17
5	The Waste Management Bureau Era.....	18
6	The Status Quo, 2023.....	19
6.1	A New IndWTMP	20
7	Annexures	22
7.1	Cited References	22
7.2	Additional Reading.....	22

1 Introduction

This Reports sets out the history of waste tyre management in South Africa since the early 2000s to present day. Over this period the waste tyre problem has gone through various stages:

- Early 2000s: Largely ignored
- ca. 2006: Planning a solution
- 2009: the Waste Tyre Regulations
- 2012: the REDISA Plan Era
- 2017: the WMB ERA

This span saw waste tyre management evolve from non-existent, through a period of rapid growth (the REDISA era), to a sudden drop followed by a period of further decline (the WMB era).

This Report examines the facts of this progression, discusses the root causes underlying this evolution (and devolution), and assesses the way forward.

2 Context

2.1 Legislative Environment

The National Environmental Management: Waste Act 59 of 2008 (NEMWA), enacted pursuant to the National Environmental Management Act 107 of 1998 (NEMA), established a framework for waste management that included the concepts of Extended Producer Responsibility (EPR) and the arrangements for Industry Waste Management Plans.

The Waste Tyre Regulations 2009 (WTR 2009) set a framework for dealing with tyres specifically and contained these key elements:

- Disposal of whole tyres to landfill (then the prevailing process) was banned with effect 2 years from promulgation, though quartered tyres were permitted, and with effect 5 years from promulgation only shredded tyres could be sent to landfill.
- A detailed specification of the content and purpose of an Industry Waste Tyre Management Plan (IndWTMP) was set out.
- All tyres had to be managed in terms of an IndWTMP.
- All tyre producers had to subscribe to an IndWTMP.
- The IndWTMP was envisioned as a public-private partnership.

It is important to note that the WTR 2009 envisaged IndWTMPs as being directly funded by tyre producers (tyre manufacturers and importers) in accordance with their extended producer responsibility. The conceptual approach was that tyre producers were the source of the waste tyre problem, and they should pay to deal with it.

There is room for debate over whether tyre producers are the entities responsible for waste tyres, or whether it should be the end-users who are held responsible, but there are practical reasons for making the producers responsible:

- Firstly, the producers are the entities that have proximate control over the constituents and design of their products and are in the best position to implement design for recycling and/or recovery.

- Secondly, the producers represent a far smaller cohort than all the end-users, and it is therefore far easier to collect waste management fees from them than from the end-users.
- Thirdly, it is functionally a difference that makes no difference. Ultimately the end-users will pay any waste management fee. EPR fees will inevitably, and quite reasonably, end up being a cost of the product. There is nothing wrong with the end-user cost of a product incorporating the costs of end-of-life management. Any other approach is a form of hidden subsidy.

It was under this regime that the REDISA Plan was drafted and, on 30 November 2012 after some legal challenges, gazetted for implementation with effect from 1 February 2013.

The REDISA Plan is discussed below, but it may be noted here that:

- It was subordinate legislation.
- Although the WTR 2009 allowed for multiple plans, no other IndWTMP was approved.
- The REDISA Plan collected waste management fees directly from producers. All funds involved were private funds, managed by a private body.
- REDISA was a private entity carrying out a function on behalf of the state. It was, during the operation of the REDISA Plan, a *de facto* organ of state whilst remaining a private entity.

2.2 Changes to Legislation

In 2013 a draft National Environmental Management: Waste Amendment Bill started being processed through Parliament. Its more controversial amendments introduced a National Pricing Strategy (NPS) that was to be published, and amendments to the financing model of waste management plans which would lead to the re-direction of all waste management fees to SARS.

REDISA over the next few years instituted court proceedings to oppose these changes, not only because it foresaw that its operating model would be changed in a way that REDISA believed would doom the Waste Tyre Plan to failure but also because there were significant question marks over the process and level of consultation that the amendments had gone through.

In the event, the critical amendments (from REDISA's point of view) were passed in 2014, and the NPS was published in August 2016.

The NPS was a requirement of the amended NEMWA, S13A:

“The pricing strategy is to contain the basis and a guiding methodology or methodologies for setting waste management charges”

It is debatable whether the NPS meets this requirement as it is describable more as a taxonomy of how waste management charges are levied under various jurisdictions. It covers all the bases but fails to make any clear prescriptions: it describes all known *“possible approaches in determining waste management charges”* and throws the problem of the actual choice of the mechanism and determination of charges back onto the Department, the dtic, Treasury and SARS². Its recommendations, such as they are, are tentative, using phrasing such as *“Suggested approach to the design and implementation of Disposal Taxes”*³

² GG40200 National Pricing Strategy for Waste Management, 11/8/2016, paragraph 2.1

³ Ibid, paragraph 4.1.2

The NPS's discussion of EPR scheme funding mechanisms veered from earlier drafts. In the 2015 draft the advantages of a directly industry-funded and privately managed model were set out:

“The selection of either the EPR 'fee' or EPR 'tax' option should be based on a model of least socioeconomic impact to consumers and businesses. Noting that industry designed, operated and managed EPR schemes can more easily implement adaptive management systems that respond to a changing industry.”⁴

In the 2016 version, the industry-funded model was illustrated, and it stated that existing schemes using this model (i.e., waste tyres) would continue to do so, but future schemes would follow the Government managed model (NPS paragraph 6.3).

Notwithstanding the exemption in the NPS, the WTR were amended on 2 December 2016 with a new Regulation 14 that forbade direct collection of a waste management fee with effect from 1 February 2017. From that date, a new environmental levy on tyres would be collected by SARS. The levy was set as equal to the waste management fee charged by REDISA, at R2.30+VAT per kg.

2.3 Attacks on REDISA

Starting in 2015 and into 2017 REDISA was subjected to various attacks. In addition to having its source of funding withdrawn:

- In 2015, the Directors of REDISA were threatened with criminal proceedings based on non-compliance of some of its depots (which is ironic considering the current state of the depots managed by the WMB)⁵.
- REDISA was subjected to a “performance audit” commissioned by the DEA. The company appointed to carry out the audit, iSolveit, was appointed in February 2016, having been registered less than 5 months earlier, through a tender advertised by the DEA on their web site. The tender vanished shortly afterwards with no record of it being awarded. iSolveit had no forensic audit qualifications nor experience. During March – May 2016 iSolveit conducted their audit in a matter of some three to four days on site, then issued a damning report. Copious information contesting their version of the state of the REDISA Plan was not considered.
- On 29 November 2016 the Minister issued an Interim Directive attempting to take over full control of REDISA. This was issued on the day before the due date for REDISA to submit its full response to the Minister on the iSolveit findings. The Interim Directive was set aside on 28 December 2016 by Davis J in terms strongly critical of the Minister: *“I find this form of litigation to be extremely disturbing coming from a Minister of State.”*
- On 1 June 2017 REDISA was put into provisional liquidation following an *ex parte* hearing. The information presented to the court in the Minister's affidavit was eventually, on 24 January 2019, found by the Supreme Court of Appeal (SCA) to have been based on hearsay and unfounded allegations, and without disclosure to the court of material facts that would have cast doubt on the motives for the *ex parte* application. The provisional liquidation was set aside, and the Directors exonerated.

⁴ GG 38438 National Pricing Strategy for Waste Management, 2/2/2015, paragraph 6.3

⁵ Annexure “2022-10-25 Non-compliant depots.pdf”

3 Principles of Waste Stream Management

Before going further, it is well to set out the principles of waste stream management that REDISA espouses. They are based on:

- Circular Economy principles;
- Closing the loop: looking at the waste tyre stream holistically; and
- Creating the right incentives.

3.1 The Circular Economy

The Ellen Macarthur Foundation defines the Circular Economy (CE) thus⁶:

“The circular economy is based on three principles, driven by design:

- *Eliminate waste and pollution*
- *Circulate products and materials (at their highest value)*
- *Regenerate nature”*

At its core is the inescapable fact that we live on a finite world whose resources we are consuming at exponentially increasing speed. In the process we are creating toxic waste and fuelling climate change. This is simply unsustainable, and, if we do not change our ways, we will as a species hit the wall – not in centuries but in decades. In some respects, we will see severe damage to the planet in the lifetimes of most of those alive today.

It is clearly overambitious to attempt to create a waste stream management plan that immediately satisfies the principle outlined above. It is however entirely possible, and we would argue imperative, that any waste stream plan drafted for implementation now should understand these principles and establish a path which has those principles as its long-term goal.

There are corollaries to this approach that are important.

The first corollary is that the justification for implementing a plan is based on the net good to society, not on short-term economics. The net good to society arises from:

- Avoidance of environmental and health costs
- Minimisation of consumption of finite resources, including landfill airspace
- Avoidance of future rectification and clean-up costs
- Ultimately, extending the time we have to find alternatives to the finite resources we are over-consuming

The second corollary is that a waste management plan cannot confine itself to a limited segment of the circle: it must place itself in the context of ultimately achieving full circularity. Concentrating on one aspect, such as the logistics of collection of waste tyres and transporting them to depots, is like trying to build a mechanical clock with most of the gears missing. We address this further in the next section.

⁶ <https://ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview>, accessed 13/1/2023

3.2 An Economic Opportunity

Implementing the Circular Economy represents an economic opportunity for governments. It creates new industries as it shifts economies from resource-intensive processes to becoming services-intensive.

One of the key enablers of the Circular Economy is Extended Producer Responsibility (EPR). EPR puts the responsibility for avoiding the negative environmental costs of their products onto the producers. In practice, this responsibility is difficult to pass on directly, but is typically effected through an EPR Organisation (EPRO). Funding an EPRO is often incorrectly seen as introducing a cost burden when the reality is that a properly constituted and operated EPRO delivers net benefits.

Studies conducted by the Energy Research Centre in the University of Cape Town calculated the economic impact of in the context of South Africa's major waste streams⁷ and of waste tyres in specifically⁸, showing that implementing EPR schemes would contribute positively to GDP. A study by McKinsey⁹ in 2016 of waste management in emerging markets that included the South African experience at the time showed that managing waste tyres in South Africa delivered net economic benefit to the country before taking environmental benefits into account.

3.3 Closing the Waste Tyre Loop

Dealing with waste tyres is far more than collecting them from dealers and putting them in stockpiles. That has been the history of waste tyre management from 2017 to 2022: In March 2017 REDISA had 21 000 tonnes of waste tyres stored in 172 000 m² of depot storage; in 2022 the WMB had 150 000 tonnes stored in 450 000 m² of depot space¹⁰. Significantly, the ballooning of depot storage occurred even as the rate of collections of waste tyres declined: the WMB, so far from securing additional offtake by processors, saw the offtake from processors decline. This failure to address the downstream demand can only mean that the illegal disposal of waste tyres (for example, fly-tipping, uncontrolled burning, or export as second-hand tyres) has accelerated.

This narrow view of what constitutes a waste tyre management plan is clearly a live misconception as evidenced by the Draft IndWTMP gazetted by the DEFF on 7 December 2022, which contains the unfortunate statement: *"a depot is the point where waste tyres changes from being a waste stream to being an input stream for processors"*¹¹. This is a document authored by supposed specialists in waste management which has gone through 10 drafts over two and a half years and sees the tyre waste stream as starting at tyre dealers and ending at depots.

The true requirements are for multiple interventions which must be applied throughout the cycle of making, using, collecting, and re-purposing tyres.

3.3.1 Design

Design must play a leading role in 'closing the loop'. The industrial age ushered in a century or more of linear economy thinking, but in the last 100 years not only has world population quadrupled but the average standard of living and per capita consumption have risen. For most of that time, we were

⁷ Annexure "ERC Report-CGE_Waste-November2016.pdf"

⁸ Annexure "ERC Report-CGE_Tyres-November2016.pdf"

⁹ Annexure "Managing Waste in Emerging Markets.pdf"

¹⁰ GG 47670 INDUSTRY WASTE TYRE MANAGEMENT PLAN, 7/12/2022, paragraph 2.2; though, the WMB presentation to Parliament on 25 May 2021 showed 534 000 m² of depot space.

¹¹ *ibid*, p.42, item 4.7.3

accustomed to a growing abundance of goods which were thrown away at end of life: manufacturers had little concern for how their products would be disposed of unless there was a clear and present threat (overtly hazardous materials and nuclear fuels are good examples).

Tyres are no exception to this mindset:

- Tyres are frequently over-designed for their purpose. Highly complex design elements are often incorporated to allow tyres to be used under conditions that are illegal in most countries, i.e., at extremely high speeds.
- They are engineered for production efficiency and lowest cost, not ease of recycling.
- Myriad formulations and types of materials are used, meaning that if waste tyres are simply collected *en masse* the chemical and material make-up of the agglomeration is a lucky dip for the processor. This means in turn that downstream processors have variable inputs which make it difficult or impractical to produce recycled product of well-defined specifications.
- Extending the working life of tyres would have the single biggest immediate impact on the waste tyre problem. Doubling the average working life would halve the volumes of waste tyres arising.

An IndWTMP must include a vision for how the problem can be addressed at source (see the section on incentives below). Failing to do so is like a national health system that focused solely on treating illnesses, with no consideration of how to prevent them.

The IndWTMP should support basic R&D to support the industry on a non-competitive basis, both upstream (design) and downstream (recycling technology). It can also leverage far greater resources to address the design challenge by incorporating incentives for the tyre industry. We discuss this below in *3.4 The Right Incentives*.

3.3.2 Reverse Logistics

In waste management, reverse logistics is the obvious and sometimes only addressed part of the product cycle. Making reverse logistics easier and more complete is important and an IndWTMP should consider this carefully. Critical elements include:

- Removing ‘friction’, i.e., making it as easy as possible for collection points (tyre dealers and others) to have their waste tyres removed, and for transporters to operate. Measures to achieve this include paperless operation and eliminating payments at the collection points.
- Co-ordination. The geographic distribution of sources of waste tyres arising, the optimum and practical location of interim waste tyre storage sites, the optimum location of processing plants, the optimum location of secondary manufacturers (making products from recycled rubber), and the location of potential energy recovery sites like cement kilns, are all based on their own economics, layers of zoning and licensing legislation, business intensity, population distributions and other factors. They do not conveniently align with one another, and the logistics system must take all this complexity into account if it is to be efficient, effective, and affordable whilst providing a decent living to the participants.
- Minimising fraud. Waste tyres are essentially fungible (with some exceptions, specifically OTR tyres). They are not readily identifiable by individual tyre, nor traceable; and once

they are baled, cut, or shredded what limited traceability they had is eliminated. This means that there are multiple avenues for fraud, including round-tripping, needless transport movements, double-counting, illegal 'cut-price' waste tyre removal, and manipulation of systems by deliberately confusing numbers and types (e.g., counting passenger tyres as truck tyres). The tracking, stock-taking and payment system supporting the IndWTMP must be alert to the risks and be designed to minimise opportunities for such fraud.

3.4 The Right Incentives

Businesses exist to make a profit for their shareholders. There are some businesses that will accept reduced profitability in exchange for reducing their environmental impact, for the greater good of society, but they are rare, and those that do may still have to answer to shareholders. Not everyone is prepared to accept a lower return on their pension fund investment in exchange for a promised dilute improvement of the health of the planet which may only be realised years or decades later.

Companies that actively try to be more socially beneficial must try to make up the costs in other ways. Some find that 'greener' designs end up saving them money, or that they can gain marketing kudos and market share in the more socially conscious markets, but in general there is a need to provide external incentives.

Most environmental, health, and waste-related taxes in South Africa achieve nothing beyond garnering funds to the fiscus. Punitive taxes like those on cigarettes and alcohol can influence behaviour because they are large compared to individual discretionary spend, and because the popularity of these commodities means they can gather large revenues to the State without destroying their industries.

A tax such as the Waste Tyre Levy, on the other hand, provides no incentives. The quantum of the tax is far too small to influence behaviour: for a typical private vehicle it adds about 0.3c/km to car running costs; on a 16-wheeler truck it adds around 15c/km. These costs are not enough to deter vehicle use, and it is almost certain that this would in any event be undesirable because the cost to the economy of everyone – individuals and transport businesses – driving less would be significant and would almost certainly cost society more in reduced GDP and lost revenue elsewhere than the cost of implementing a waste tyre plan.

The waste tyre levy effectiveness as an environmental force is further blunted by being applied at a flat rate on all tyres. There is nothing a tyre producer can do to change the amount they pay, and nothing the end-users can do. In effect, tyre producers are no more than collectors of a tax on behalf of the state, a tax as arbitrary and unfocused as, say, transfer duties. Transfer duties are not there to discourage sale of property, they are just a means sanctioned by custom of raising money for the State. The current tyre levies fall into the same category.

A final consideration on the tyre levy is that it shifts responsibility from the producers to the State. NEMA introduced provisions for creating liability for environmental harm in Section 28(1):

“Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.”

A subsequent amendment in S28(1A) made that liability both retrospective and forward-looking.

The existence of an independent EPRO provides a means for the affected industry to pass their responsibility on to the EPRO (an industry-managed EPRO is clearly less credible in this context). However, an environmental levy like the Tyre Levy currently in operation passes that liability back to the State: industry can argue that they have paid their levy, and now the State must deal with the problem.

There are however mechanisms for using an IndWTMP to incentivise the implementation of CE principles, which we discuss below when we discuss the REDISA Plan.

3.5 Path Dependency

There is a further barrier to change known as path dependency (sometimes also as stranded capital).

Path dependency refers to the predicament a business can find itself in when it has invested heavily in fixed assets, such as a manufacturing plant, which gets overtaken by changes in technology, legislation or public sentiment. For example, a plant can be using obsolete technology that is polluting the environment to a degree that was hitherto accepted but has become unacceptable. In the worst case for the business it may become illegal to continue operations, but more often it just becomes more socially unacceptable.

The history of the business, how it got to where it is today, has meant that the investment in the businesses has become stranded capital. The dilemma for the business owner is that he or she can continue operating the plant as it is, in the face of opprobrium, or scrap the obsolete equipment at great cost. Writing off that capital is painful and may be beyond the resources of the business.

A waste management plan in any waste stream must be live to the barrier to progress that path dependency can pose. It is not enough to acknowledge it and shrug it off as business's problem when the societal cost of failing to address the issue is greater than the cost of remediation.

The details of how to balance the books and arrive at an equitable solution can vary, but in South Africa's unique socio-economic and political environment this is a prime candidate for creating opportunities for building BEE participation in the industry. One possible model would be grant funding in exchange for BEE shareholding with a vesting period.

4 The REDISA Plan

4.1 Inception

The REDISA Plan¹² was developed over a few years and initially approved in November 2011 whereupon it encountered legal challenges from the tyre industry, ostensibly objecting to the process followed. The challenges were dealt with and on 30 November 2012 the Plan was gazetted with an effective implementation date of 1 February 2013.

The defining aspects of the REDISA Plan were:

- It uncompromisingly made the case for a single national plan.
- It insisted on independence from tyre industry.

¹² Annexure "2012-11-30 GG 35927 REDISA Plan.pdf"

- It recognised the ineluctable fact that waste tyre processing, and the waste tyre stream more generally, requires funding.
- It was based on a funding collection and disbursement model that made for the simplest and most fraud-resistant financial management system.
- It provided for trading off efficiency and socio-economic goals of job creation and small business development.
- It allocated funding specifically for R&D.

4.2 The Single Plan

The arguments for a single plan and single implementer are set out at some length in the REDISA Plan but can be paraphrased and summarised here.

It is debatable whether a single plan for waste tyres constitutes a monopoly. If a large organisation with 10 000 staff has a single medical aid provider for its personnel, that would not be deemed a monopoly, even though other medical aid companies would be excluded from that company. South Africa has 38 waste streams, most of which need a waste stream management plan: selecting a single service provider for one of those waste streams is nothing more than sensible.

Some activities are best served by a single provider within a prescribed setting, natural monopolies either intrinsically and indefinitely or for an initial period as technologies and infrastructure develop. An example of an intrinsic monopoly would be water supply: it would be totally impractical and wasteful to run multiple water delivery systems throughout a municipality just so that individual users could choose between suppliers.

An example of an intrinsic monopoly that becomes transformed as technology evolves would be Eskom. For decades, electrical reticulation has been a natural monopoly, but slowly we see an era emerging where more and more localised generation and distribution becomes practical, chiefly as renewable energy systems develop. Another example is spaceflight: again, for decades it was a national monopoly like NASA in the US, but as technology evolved, and in this case largely because of the work NASA did, commercial spaceflight companies have emerged.

There is hope that in time waste tyre processing will become economically sustainable, but that is a process that requires technological development at multiple points in the tyre life cycle. An IndWTMP can and should be a major driver of those technological developments, but until that point is reached it is unquestionably a natural monopoly.

The need for national coordination is obvious and even the most recent published draft IndWTMP (published 7 December 2022), which starts off dogmatically insisting on multiple implementers, flounders and reverts to a single implementer when it hits a logical impasse trying to define the implementer(s) obligations and responsibilities. Here are some examples from item 5.3 of that draft that cannot logically be read as the joint responsibility of competing implementers:

- *“Implementers in consultation with the WMB will develop a depot operator model”*
- *“Assume overarching operational management of waste tyres in South Africa”*
- *“Implement the IndWTMP and adhere to the targets for waste tyre processing and reduction in stockpiles at Depots as set out in item 3.4.2”*

- *“Maintain an electronic and transparent monitoring system to ensure accurate reporting in accordance to items 3.4.3 and 4.8, and to support legitimate claims for waste tyres collected and/or processed in terms of progress against targets.”*
- *“Incentivise the establishment of a waste tyre processing industry in South Africa via suitable subsidies to key stakeholders”*
- *“Devise a payment system for micro-collectors and micro-depots as envisaged in section 4.7.2”*

And in item 4.8.4 of that draft:

- *“National aggregated”* reporting on tyres produced; waste tyres collected, recycled and recovered; jobs created; and businesses established.

These excerpts from the draft in themselves constitute an unarguable case for a single implementer.

4.3 Industry Independence

An EPRO run by the industry whose waste it manages is ‘putting the fox in charge of the hen coop’. Nearly all products eventually become waste, and it is convenient for producers to leave the cost of managing that waste as an externality, paid by ‘someone else’ – usually various levels of government. Ultimately, those externalities become hidden subsidies that taxpayers fund.

The costs of running an EPRO to manage waste will be reflected in product prices. Whilst businesses might profess social conscience, it is difficult for them to discourage sales of their products by increasing prices. Inevitably, they will run the EPRO at the lowest possible cost rather than for the greatest societal benefit. Industry-managed EPROs can therefore become token organisations, an exercise in ‘green-washing’.

For an EPRO to be effective, it must be independent from the industry it serves as well as from the service industries it creates, i.e., transport and reverse logistics, waste processing, and depot operation.

4.4 Funding

Many academic papers, and the various drafts of the Section 29 IndWTMP being proposed by the CSIR and the DFFE, like to characterise waste tyres as a valuable resource, presumably as a motivation for doing something with them. This ignores the patent truth that waste tyres are a problem in every country in the world. If they represented a valuable resource that attracted exploitation that would certainly not be the case.

Waste tyres are an unwanted problem. We would do nothing to manage them were it not for the fact that ignoring the problem leads to bigger problems, both now and foreseen – for example, they cannot continue to be discarded to landfill because landfill airspace is a limited and costly resource.

It therefore makes sense to absorb this reality and build on it. The flow of activities and related funding in the REDISA Plan is neatly encapsulated in **Error! Reference source not found.** below. (The numbers in brackets are the numbers of each entity active in the REDISA network as at May 2017.)

The funding management in the REDISA Plan had features that were critical for its success:

- The funding was collected directly from tyre producers, a relatively small cohort of about 180 entities and therefore easy to administer.

- The waste management fee levied on producers was mass-based, i.e., a rate per kg, not unit-based. Unit-based levies are inherently unfair as passenger tyres, for example, can differ by 2:1 or more in mass. Moreover, accounting by units becomes impossible once tyres are cut, shredded, or baled, and opens up creative opportunities for manipulating values.
- No value was ever assigned to a waste tyre. The service providers were not paid for tyres, they were paid for services performed. Transporters specifically were paid to collect and deliver tyres.
- No money changed hands at collection points (tyre dealers, transport companies, etc.): collection of their waste tyres was a free service. Similarly, tyres were delivered free of charge to processors who would receive subsidies based on waste tyres processed.

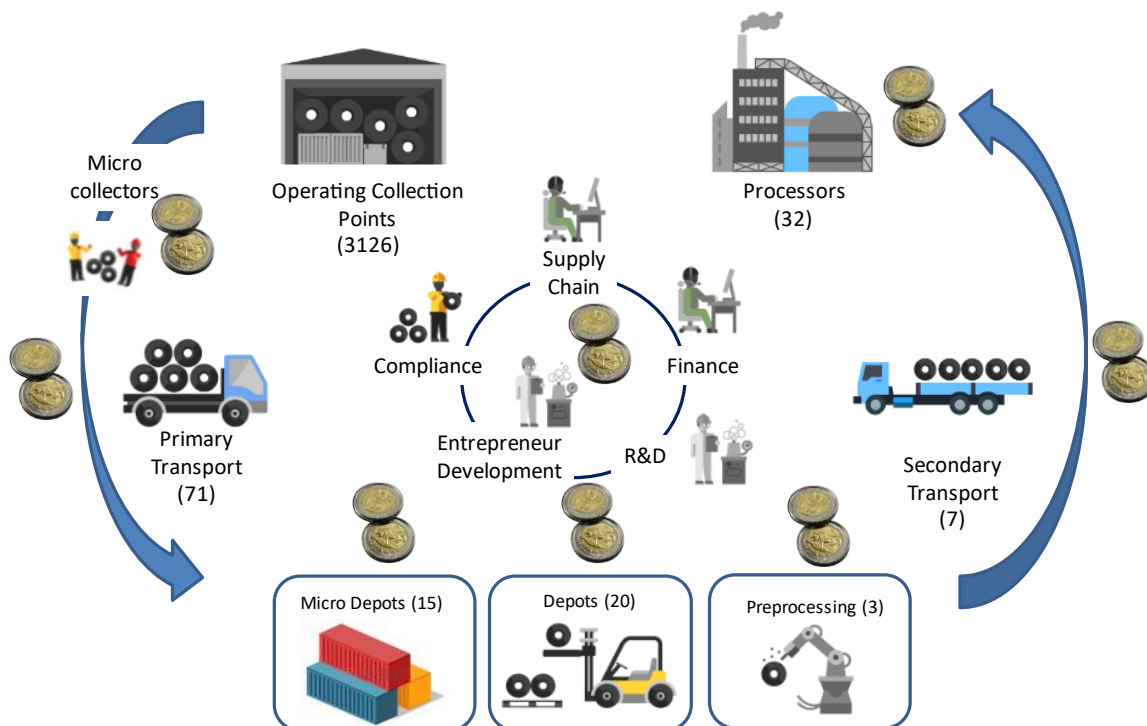


Figure 1: Flow of Funds

The process illustrated in Figure 1 was underpinned by a sophisticated tracking and tracing system using QR codes and GPS data to tag every collection and delivery of waste tyres by location, collection point, depot, processor, driver, and vehicle, all operating in near-real time. This comprehensive tracking made automated anomaly detection possible, and once fully implemented it reduced transport costs by over 20% without affecting total performance.

4.5 Socio-Economic Goals

The WTR 2009 under which the REDISA Plan was developed and operated included in its Regulation 9 socio-economic goals in addition to the basic waste tyre management tasks. The REDISA Plan accorded with this in multiple aspects:

- Transporters, depot operators and processors were required to be 51% Black-owned.

- Transport contracts were kept localised where possible, i.e., smaller businesses were appointed for regions instead of appointing a national contractor for all waste tyre logistics.
- Transporter payments were made weekly or twice weekly, recognising that nascent businesses are typically short of operating capital.
- Depots were established on a Build-Operate-Transfer model, giving depot operators the opportunity to become independent businesses.
- Training and support for SMMEs was built into the funding requirements.

4.6 Long Term Vision

Ideally, an EPR should have a limited lifetime, be it ten or twenty years, during which it establishes a model for its waste stream that encourages and supports investment and development which in due course make the waste stream economically self-sustaining. The catalysts for this are technological developments on the one hand, making recycling and secondary manufacturing more viable, and the rising cost of virgin materials.

An IndWTMP can help drive technological development through running R&D programmes on behalf of the industry, as indeed the REDISA Plan did. However, it can have a far bigger impact in other ways as we discuss in the following sections.

4.6.1 Norms and Standards

A significant barrier to the use of recycled products is the often-correct view that they are not of the same standard as virgin materials. There is however a more subtle problem, which is that their quality is inconsistent. Manufacturers can adapt their processes to different input materials as long as those materials have the same properties in each delivery.

In the case of tyres, the great variety of tyre types with varying materials and construction details, many of which are held as trade secrets, makes it difficult to control the quality of products such as rubber crumb. This difficulty is compounded by the lack of comprehensive standards specifically appropriate to recyclates. A downstream user must adapt processes and final product specifications to the 'lowest common denominator' of the input materials.

4.6.2 Environmental Rating

The funding that an IndWTMP can provide for R&D is tiny compared to the combined R&D budgets of the world's tyre manufacturers. If manufacturers can be persuaded to apply more of their R&D budget to making tyres that have an improved environmental profile, they could achieve far more than small R&D projects run by the IndWTMP. That R&D can focus on:

- Extending tyre life
- Reducing or eliminating harmful chemicals
- Simplifying and standardising on tyre construction, and designing for deconstruction
- Facilitating sorting prior to processing, e.g., through embedded RFID tags

Some of these goals are not currently in the interest of tyre producers, would cost them money to implement, and none of them warrant significant attention from them.

The key to mobilising the R&D described above is to provide an incentive to tyre manufacturers. That mechanism is Environmental Ratings (ERs).

The concept behind ERs is to give specific tyre designs a rating based on the measures outlined above:

- How long does the tyre last?
- What does it contain?
- How easy is it to recycle?
- How much material can be recovered?

The ER is then used as a factor to determine the waste tyre management fee applied to that tyre design: tyres with poor ratings attract a higher fee, those with better ratings, a lesser fee. In due course, it could be that tyres that do not achieve a minimum rating may not be sold; on the other hand, tyres with the highest rating may attract no fee as they would have extractable value in the market and would need no external incentives to be collected and processed.

This approach gives the tyre manufacturer a direct financial incentive to spend R&D on the qualities that will reduce, or eliminate, the waste tyre management fee on its tyres.

4.6.3 Sustainability Accounting

Businesses' financial statements rarely concern themselves with sustainability. Externalities are ignored and potential environmental liabilities not considered.

Currently, except for the mining and oil industries, this form of reporting is not regulated. There is little or no recognition in the accounting standards for a manufacturer's extended producer responsibility and the costs associated with this that need to be provided for into the future. A further discouragement lies in the tax treatment of provisions for future EPR costs as no deductions are allowed for them.

A company may decide of its own accord to use IAS 37 to record a provision for future economic outflow due to its extended producer responsibility. This is rarely done outside the mining and oil industries as manufacturers are not being held accountable in terms of the "polluter pays" principle for their negative impact on the environment.

The existence of an independent EPRO and established Environmental Ratings are enablers for Sustainability Accounting, on the one hand moving potential liabilities onto a third party akin to an insurance product, and on the other hand providing an independent measure that can contribute to the sustainability score.

4.7 The Product Testing Institute

Establishing norms and standards and developing environmental ratings require an independent body with the appropriate focus and skills. That is what REDISA set about establishing.

REDISA funded the construction of the Product Testing Institute (PTI) in Coega, Gqeberha, which was completed in April 2017. The PTI is a world-class facility with a five-star environmental rating incorporating state of the art testing equipment, teaching facilities, laboratories, and offices. It is the only independent facility on the African continent capable of testing tyres to international standards for homologation purposes, and one of only seven world-wide.

The PTI purposes are to be:

- A facility for testing tyres to international standards.

- An analytical laboratory with links to academia capable of developing norms and standards for tyre recyclates and other products.
- A centre to perform Environmental Ratings.
- A teaching facility working with the Nelson Mandela University to build the skills needed to drive tyres into the Circular Economy.

4.8 REDISA's Achievements

REDISA formally began operating from a zero base on 1 February 2013 when the tyre Waste Management Fee came into force. At the time, waste tyre processing or diversion from landfill rate was estimated by the DEA to be 4%.¹³

By May 2017, REDISA:

- Was servicing 3126 collection points, including 1497 tyre dealers, and 32 Processors;
- Contracted with 71 primary transporters and 7 secondary transporters;
- Had established 20 depots and 15 micro-depots;
- Achieved 42% waste tyre diversion rate in its third full year of operation.
- Had met Government's target of 25% recycling of waste tyres.

REDISA's progress in its first three years is shown in *Figure 2*.

In *Figure 2: REDISA's Tyres Diversion Rate* 'Collection' refers to waste tyre diverted as a percentage of waste tyres available for collection.

In the period February 2017 – April 2017, of the 1497 tyre dealers being serviced by REDISA:

- 66% had at least 3 collections
- 79% had at least 2 collections
- 100% had at least 1 collection

¹³ Annexure "2011 Baseline Study published in November 2012.pdf"

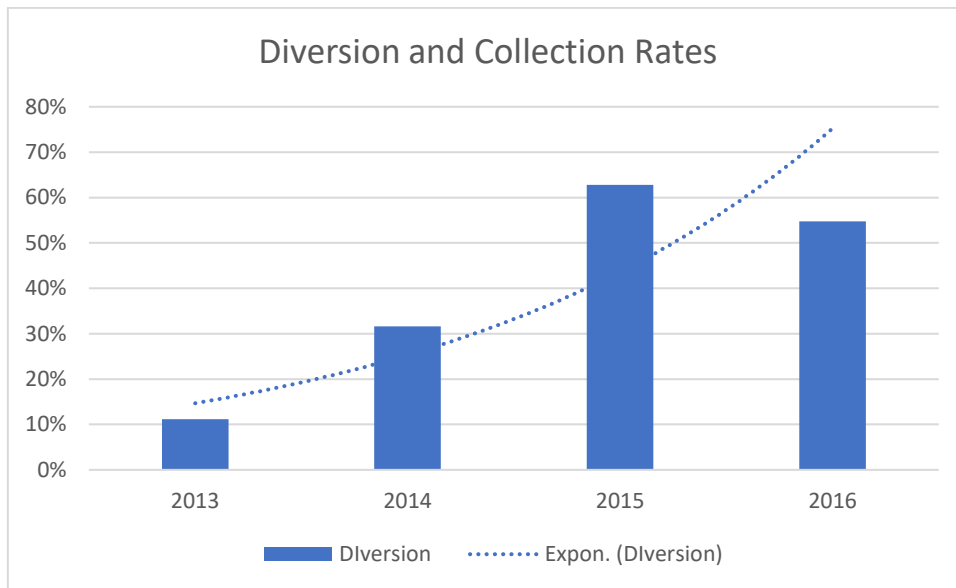


Figure 2: REDISA's Tyres Diversion Rate¹⁴

5 The Waste Management Bureau Era

2016/17 saw the beginning of the end of REDISA's operations. Funding had been cut off with effect from 1 February 2017 and REDISA was clearly under attack, having to fend off the Minister's Interim Directive of 29 November 2016. Operations suffered, and REDISA was beginning to plan for an orderly closing down.

On 1 June 2017 the provisional liquidators arrived unannounced and seized control of the operations. From that point on, until 30 September 2017 when the REDISA Plan was formally withdrawn, they ran REDISA in compliance with the DEA's wishes. From 1 October 2017 waste tyre management was fully the responsibility of the WMB.

The various drafts of the Section 29 IndWTMP record the difficulties experienced by the WMB: depots over-full, processors closing, dealers not being serviced. The decline of waste tyre management is starkly evident if the graph in Figure 2 is extended using the most recent data available, as in Figure 3. The data for the post-REDISA era is drawn from DEA/DFFE annual reports and annual performance plans (APPs).

Some of this data is suspect:

- The diversion rate reported for 2018/19 is exactly (to the tonne) 50% of the estimated waste tyres arising and is in turn the same (to the tonne) as the 2018/19 APP forecast for 2019/20.
- The diversion rate reported for 2021/22 in that year's annual report, at 12.5%, was flagged by the Auditor-General as unable to be verified "*due to the lack of accurate and complete records.*"

¹⁴ Source: REDISA reports to DEA and tyre producer returns

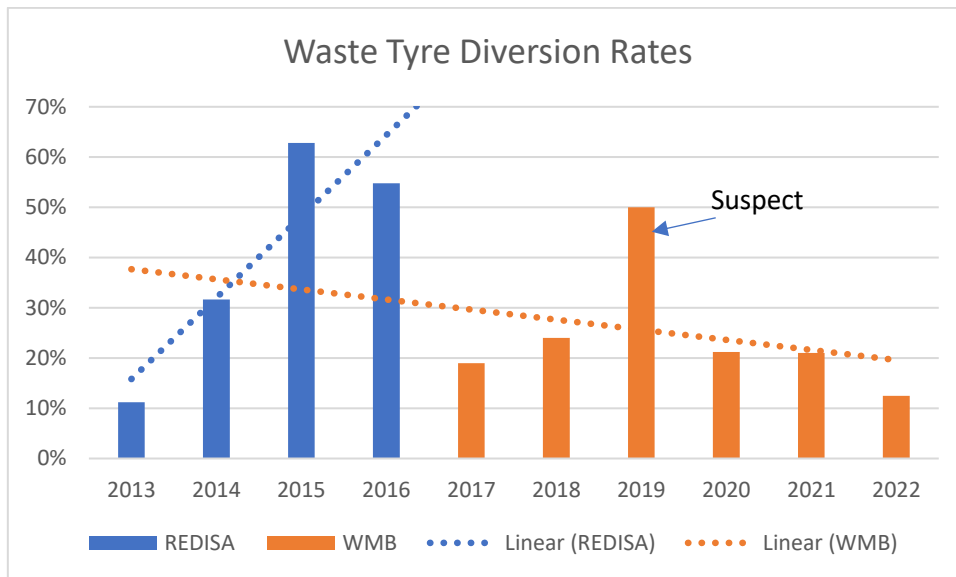


Figure 3: Tyres Diverted Decline under WMB

The state of the depots is deplorable¹⁵. The storage space has ballooned as noted above in 3.3, and the standard of management has declined. A review of WMB-managed depots, using Google Earth for 18 depots whose coordinates we could establish, reveals:

- 2 are larger than the permitted 30 000 m² storage area (by 34% and 63%). If we use the numbers in the latest IndWTMP, we must add Bloemfontein and Kroonstad at respectively 42 000 m² and 50 000 m²; and if the WMB presentation to Parliament on 25 May 2021 is correct, also Thohoyandou at 50 000 m².
- 14 have tyre heaps that exceed the 20x10m maximums, most by a factor of two or more.
- 5 have firebreaks between the tyre heaps and buildings that are less than 1m (6m is required).
- 3 have firebreaks to the perimeter fence of less than 1m (8m is required).

These infractions are more than technicalities: most of them create fire risks that make them disasters waiting to happen.

Suffice to say that the performance of the WMB has been dismal.

6 The Status Quo, 2023

The failure of the WMB cannot be entirely blamed on the Bureau, as they have been required to operate under conditions that made success unlikely at best.

- The WMB is operating with a limited budget that is inadequate for the task. This is apparent not only in that the appropriations they receive are far less than the income REDISA worked with (and far less than the tyre levies collected), but also by their own admissions in the latest Section 29 plan. For example, it is stated that micro-collections are limited according to budget, not according to need, and there is a discussion of how depots have “fallen short of their monthly expense obligations”, including not paying their taxes.

¹⁵ Annexure “2022-10-25 Non-compliant depots.pdf”

- The WMB must operate within the PFMA framework, which is notoriously ponderous, inflexible, and open to challenges from anyone who feels aggrieved.
- The management system they have is presumably not as sophisticated as REDISA's: the WMB likely did not have the time, budget or expertise to commission and implement such a system.

The status quo is an excellent illustration of why government should govern, not attempt to be operational in a complex and rapidly changing environment.

6.1 A New IndWTMP

The Department has launched initiatives to have a new IndWTMP created and implemented, albeit at a glacial pace.

In 2018 a call for industry to submit plans resulted in four submissions. Two, from respectively JPC Tyre and Evergreen, were basically proposals for setting up pyrolysis plants and could not be IndWTMPs. The other two, from respectively SATRUCO and TWAMISA, were attempts at an IndWTMP that fell short of requirements. Neither had real substance and both were rejected.

The Department then called on the CSIR to develop a plan under Section 29 of NEMWA. The first publicly available draft from the CSIR, dated March 2020, set the scene for all the subsequent drafts. None of them constitute an IndWTMP; at best they can be considered frameworks within which an IndWTMP should be drafted. Unfortunately, they are riddled with errors, contradictions, inconsistencies, and language that is entirely inappropriate for subordinate legislation in that it is often vague, ill-defined, ambiguous, and incomplete. REDISA has submitted detailed commentaries on the publicly released drafts which appear to have been ignored, even to the point of repeating clear factual inaccuracies (such as the effective inception date of the REDISA plan).

It is two and a half years since the first draft of the CSIR IndWTMP. The latest draft (the 10th or later) shows little improvement. There is obviously room for disagreement on the fundamental policy directions in the S29 plan, but there are many faults with it that render it impossible to conceive of it being able to be promulgated. Detailed commentaries on both the March 2022 draft (Draft 9)¹⁶ and the gazetted draft¹⁷ are annexed.

- It sets targets for stockpile abatement and tyre diversion in 2023 and 2024 that are patently impossible.
- It still contains drafting errors, conflicting definitions, factual inaccuracies, and practical impossibilities that mean there is no possibility of it being gazetted without extensive re-writing.
- It creates a confused web of overlapping responsibilities and authority that would make it impossible to enforce due performance or penalties for non-performance. (This lack of enforceable accountability applies to the WMB as well as to any implementers.)
- It directly contradicts itself in multiple places.

The steps needed to get to a working IndWTMP following the latest gazette of 7 December 2022, whose commentary period closes on 6 February 2023, are:

¹⁶ Annexure "2022-04-05 Commentary on Draft 9 IndWTMP- Final.pdf"

¹⁷ Annexure "2023-02-02 Comments on GG47670 INDUSTRY WASTE TYRE MANAGMENT PLAN.pdf"

1. A wholesale re-draft must be produced that can survive review and irrationality challenges.
2. A coherent tender for implementers must be issued, adjudicated and awarded.
3. One or more implementers must
 - a. establish themselves,
 - b. employ staff,
 - c. implement systems,
 - d. complete preliminary works such as stockpile audits and “*detailed pre-feasibility studies*” of incentives, and
 - e. commence operations in the field.
4. Budgets, which can only be drawn up once the preliminary works are completed, must be submitted to Treasury and approved.

Note that there is some confusion surrounding the timetables in the gazetted plan as it requires that each implementer develop an “*implementation plans, business plan within the first 3 months of implementation*”. It is not clear what is meant since implementation without an implementation plan is not acceptable business practice. This further means that implementers must be appointed before they have developed their budgets and business plans.

It is difficult to see this resulting in any substantial impact before 2024 at the very earliest.

7 Annexures

A folder containing Annexures accompanies this Report. The documents included are listed below.

7.1 Cited References

- *2011 Baseline Study published in November 2012.pdf*
- *Commentary on Draft 9 IndWTMP- Final.pdf*
- *GG 35927 REDISA Plan.pdf*
- *GG 38438 National Pricing Strategy For Waste Management.pdf*
- *GG 40200 National Pricing Strategy for waste Management.pdf*
- *ERC Report-CGE_Tyres-November2016.pdf*
- *ERC Report-CGE_Waste-November2016.pdf*
- *Managing waste in emerging markets.pdf*
- *Non-compliant depots.docx*
- *PPC meeting - Functioning of Waste Bureau.docx*
- *Waste_Bureau_Presentation.pptx*

7.2 Additional Reading

Included in the Annexures are background research documents that provide useful information on the Circular Economy and waste management:

- *2000 Extended Producer Responsibility in Cleaner Production.pdf*
- *Barriers and enablers of CE.pdf*
- *Historical Review of Waste Management -resources-06-00057.pdf*
- *Unlocking the Opportunities of a Circular Economy in South Africa.pdf*