



**SPREP**  
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## Community Factsheet

# END OF LIFE TYRES (ELT)



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An estimated one billion tyres worldwide (about 17 million tonnes) reach the end of their use every year. This number has been growing steadily and this trend is expected to continue in the future. While there are efforts by governmental authorities, the tyre industry, and individual manufacturers to manage end-of-life tyres (ELTs), there is still much to be done.

Pacific Island Countries (PICs) have a high generation rate for ELT and extremely limited means for safe disposal. Several possible uses or processing options exist for ELTs (existing technologies, uses, processes or management activities), and a research report and a series of publications seeks to assess each use or option for suitability in the Pacific, and highlight the associated benefits and potential issues with its implementation.

A contributing factor to the high generation of ELTs in most Pacific Island countries and territories is the limited control over the quality of tyre imports, often resulting in the importation of large quantities of second-hand tyres (re-treads).

It is estimated that some 6,700 tonnes, or approximately 670,600 tyres, reach end of life annually across all PICs.

This Community Factsheet provides information on how to properly manage ELTs.

# What Are End-Of-Life Tyres?

When a tyre is no longer sufficiently safe or efficient to be used, it is termed a waste tyre or an “end-of-life tyre” (ELT).

## What Happens To End-of-Life Tyres?

Common practice of managing End-Of-Life Tyres in the Pacific:



### Illegal Disposal

Using data on the types of tyres imported/exported in the Pacific from the United Nations Comtrade database, it is estimated that **22,000 tonnes** of tyres are illegally stockpiled, buried or burnt annually in PIC.



### Landfilling

Most landfills in the Pacific accept whole ELT even though tyres are awkward to handle and difficult to compact with regular waste. However, ELT in landfills retain pockets of air and tend to float or rise to the surface of a closed landfill over time, causing damage to the landfill cover.



### Storage

With limited options for in-country recycling and repurposing, a review of several sources of PIC waste and recovery organisations, tyre businesses and anecdotes in the press, indicates that ELT storage practices in PIC tend to be ad-hoc and unregulated.



### Landscaping

Pacific Islands communities utilise ELT for landscaping as the empty space inside a whole tyre is well-suited for planting heat-loving plants.



### Children's Playground Equipment

Tyres are used to create big and small climbing, balance, and coordination challenges for children. Children will go through tyres, on top of or just for balance.



# Why are Waste Tyres a Concern?

- Ground & Water Pollution
- Biosecurity
- Air Pollution
- Health Hazards
- Safety Hazard



## Ground & Water Pollution

Tyres will degrade due to the sun, temperature, and conditions, and potentially leach pollutants (such as Zinc and polynuclear aromatic hydrocarbons (PAH)) into the surrounding environment.

## Biosecurity

Whole tyres, when dumped, may hold water, enabling the incubation of mosquito larvae, which in turn may increase the risk for disease such as malaria and dengue fever. In drier regions, dust settles within tyres with the associated risk of transfer of seeds, insects, and other vermin associated with export of baled tyres.

## Air Pollution

Significant tyre fires are recorded regularly around the world, even in well-managed ELT stockpiles. Tyres, when burnt in the open, emit several types of classified pollutants, such as particulates, carbon monoxide (CO), sulfur oxides (SO<sub>x</sub>), oxides of nitrogen (NO<sub>x</sub>), volatile organic compounds (VOCs), PAHs, dioxins, furans, hydrogen chloride, benzene, polychlorinated biphenyls (PCBs); and metals such as arsenic, cadmium, nickel, zinc, mercury, chromium, and vanadium. Research (*Ferronato & Torretta - Waste Mismanagement in Developing Countries, March 2019*) reported that the emission levels from tyre fires are:

- CO from different type of tyres were 21–49 g/kg,
- SO<sub>2</sub> emission was found to be 102–820 g/kg, NO<sub>2</sub> emission was 3–9 g/kg.
- Among metals, ZnO and CO have been found to be 21 and 92 times higher than an area far from the open fire.

## Health Hazards

Emissions from an open tyre fire can represent significant acute (short-term) and chronic (long-term) health hazards to firefighters and nearby residents. Depending on the exposure time and concentration, these health effects could include irritation of the skin, eyes, and mucous membranes, respiratory effects, central nervous system depression, and cancer. Open tyre fire emissions are estimated (*USEPA Clean Air Technology Centre, for Office of Air Quality Planning and Standards - Air Emissions from Scrap Tyre Combustion 1997, EPA-600/R-97-115*) to be 16 times more mutagenic (substances that can cause mutations) than residential wood combustion in a fireplace, and 13,000 times more mutagenic than coal-fired utility emissions with good combustion efficiency and add-on controls.

## Safety Hazard

Although ELT should not be reused, sometimes they are substituted as cheap alternatives to new tyres. ELT are sometimes sold 'as is', without re-treading or otherwise improving serviceability of the tyres. When tread is reduced to a minimum thickness, the tyre should no longer be used on the vehicle because a small road impact (e.g. pothole) may cause the tyre to burst, or the lack of tread may cause uncontrolled motion due to loss of traction in cornering or braking.

# How Can You Properly Manage ELTs?

- Contact relevant government ministry in your country to understand available options for safe disposal of ELT
- Safely store ELTs while awaiting collection or advice from your government ministry
- Do not dump or burn tyres

It is recommended that tyres are stacked using the following methods to minimise the intensity of a fire:



## Barrel Stacking

This includes storing tyres vertically in a stack with the intent of preventing fires from spreading to different stacks, due to the 'whirlpool' effect of the stacked tyres.



## Laced Stacking

Whereby the tyres are stacked in an overlapping fashion, forming a 'lace' pattern that maximises use of storage area whilst at the same time reducing the risk of tyres rolling off the stack.

While ELT stacking can be a useful temporary solution for stockpiles, it is recommended that tyres are removed at the earliest opportunity.

## How to Safely Store ELTs?

For **OUTDOOR** settings it is recommended:

- A stack should **not exceed 6 m in width and 20 m** in length;
- The edges of the pile should be **at least 15 m from the perimeter fence** and this area should be free of debris or vegetation;
- Interior fire breaks should be **at least 18 m wide**;
- The area extending **60 m from the outside perimeter** of the piles should be **devoid of any vegetation**;
- Inhabited buildings, parked vehicles, etc. should also be **at least 60 m from tyre piles**;
- The site should be flat, with a concrete or hard clay surface and should be designed to capture and contain water run-off;
- Scrap tyre storage should not be on wetlands, floodplains, ravines, canyons, or on any steeply-graded surfaces;
- Any open-air burning should be **at least 305 m (1000 ft)** from the tyre pile;
- Heat generating devices (e.g., welders) should not be operated **within 60 m (200 ft) of tyre piles**; and
- Lightning rods should be installed, but away from the tyre piles.

For **INDOOR** storage it is recommended:

- Tyre stacks should be stored at a **maximum of 3.7m high with a maximum area of 30m<sup>2</sup>**.
- Stacks are to remain at a **minimum of 2m distance from each other** as well as from containing building structures;
- Any stockpile of tyres of **20 tonnes or more should be accompanied by a sprinkler system**;
- In storage areas where there are no sprinkler systems present, **3m is the recommended inter-stack distance** for best practice; and
- There should be a **minimum of 1 metre distance between stacks and walls and roofs**.

By utilising these arrangements, in the event of a fire, firefighting operations can be assisted by preventing concentrated fires from forming within stacks. Long and thin piles, for both indoors and outdoors, are recommended to prevent fires from spreading between stacks.

For more information please contact:



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