



Waste Tyre Management Kenya

Presentation of the Proposed Model

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Content of the Presentation

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- Strategic Alliance on Waste Tyre Management
- The Problem
- Information about Waste Tyres in Kenya
- Technical Options
- Cost Analysis
- Proposed Model





History of the Waste Tyre Initiative

- Waste Tyre Management Association (WATMA) formed in 2007
- Championed by NEMA to set up a tyre disposal fund using tyres as efficient and environmentally sustainable disposal whilst creating requisite policy and regulatory framework
- Members comprise wide range of actors including tyre manufacturers, dealers transport companies and relevant government departments
- In 2009 GTZ was approached to support the initiative.
- PPP identified as viable instrument
- In May 2011 the Strategic Alliance for Waste Tyre Management Kenya has been established



The Strategic Alliance on Waste Tyre Management in Kenya

- Objectives of the Alliance
- Structure of the Alliance
- Milestones

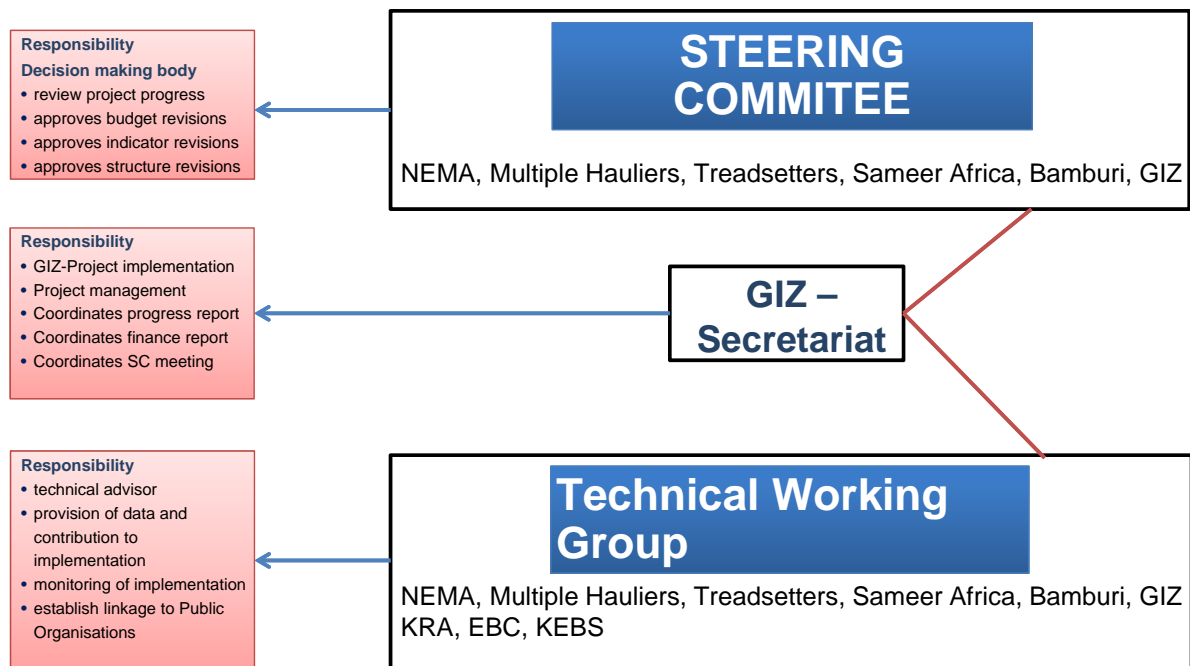




The main objective of this initiative is to develop a waste tyre management system in Kenya, **where the regulatory framework is provided by the Kenyan government and the private sector is designing and implementing the system in cooperation with NEMA.**

Phase 1: A concept for collection and utilization of waste tyres will be prepared and the regulatory frame will be developed.

Phase 2: after successful implementation of phase 1, the waste tyre management system will be implemented.



New members are welcomed to join the alliance





Milestones of the Strategic Alliance on WMTK

- Partnership established in May 2011
- Concept and Feasibility Studies for collection and recycling of waste tyres prepared and agreed upon (April 2012)
- Core group consisting of NEMA, GIZ, Sameer Africa, TreadSetters & KRA established to follow up on concept implementation
- Consultations with Ministries of Environment and Finance ongoing through NEMA to seek their support



The Problem

In 2012, about 2 million waste tyres are generated in Kenya. This amount is increasing every year.

Tyres are not biodegradable and there are no facilities to process the resulting waste. If not handled properly, waste tyre can pose a major ecological threat.

Presently, the majority of tyres are collected and burnt in an open space, for example in dumps or other selected areas, to recover steel strap which is then sold off to metal dealers and industrial manufacturers for a fee.





Open burning of waste tyres



Burning of tyres to recover the steel wires



**Average revenue for selling the wires to scrap dealers:
15 – 40 KES per kg**





Burning of tyres is done discreetly as it is outlawed and perpetrators are sometimes arrested and arraigned in court.

Open air burning of these tyres results in emission of hazardous gases like dioxins, mercury, hydrogen chloride, sulphuric acid, flourides and particulates that can damage human health.

These gases not only affect those within close proximity to the burning activity but spreads far and wide to cover a significant range and linger for a while thereafter.



Information about Waste Tyres in Kenya

- Amount and Sources of Tyres
- Estimation of Waste Tyres
- Forecast
- Final Destination of Waste Tyres





Estimated amounts of waste tyres in Kenya in 2009

	Total number of vehicles in Kenya	Average number of tyres per vehicle	Average mass of tyre	Time period of use including retreading	Total mass of waste tyres	Total number of waste tyres
	no	no	kg / tyre	years / tyre	tons	no
Motor Cars	499,679	4	9	3.5	5,140	571,062
Utilities, Panel Vans, Pick-ups, etc.	219,901	4	25	2.5	8,796	351,842
Lorries, Trucks and Heavy Vans	91,431	10	50	2.5	18,286	365,724
Buses	26,558	8	50	2.5	4,249	84,986
Mini Buses/Matatu	58,286	6	25	2.5	3,497	139,886
Trailers	27,039	6	50	2.5	3,245	64,894
Wheeled Tractors	25,091	4	60	5	1,204	20,073
Motor Cycles	239,104	2	5	4	598	119,552
Three Wheelers	13,856	3	6	3	83	13,856
Other motor vehicles	20,138	4	15	3.5	345	23,015
Total	1,221,083				45,443	1,754,889



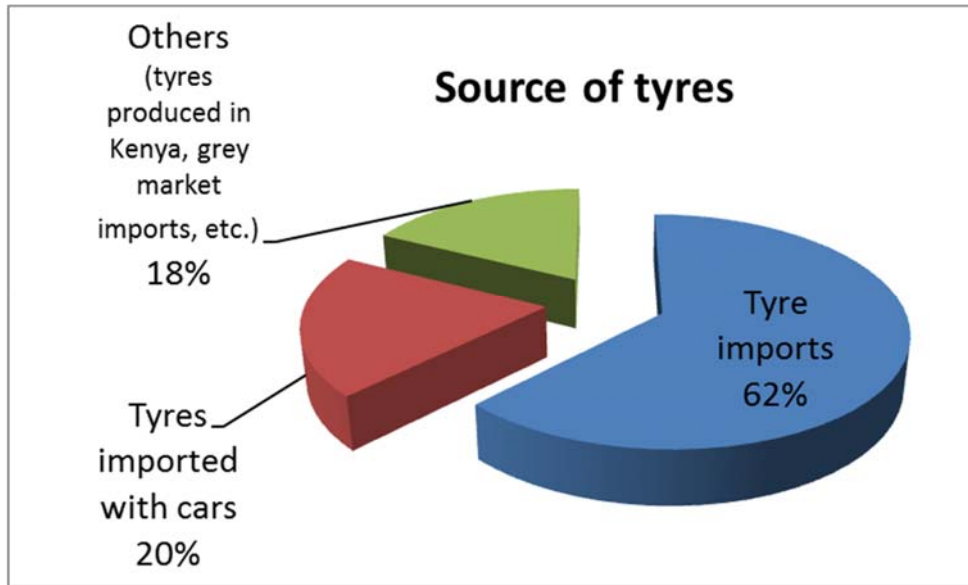
Tyre imports into Kenya in 2011 (source: Kenya Revenue Authority)

Imported tyres per company [tons in 2011]	No. of companies	Amount of tyres [tons in 2011]	Percentage of total weight
more than 1000	5	13,759	42%
250-1000	21	8,647	27%
100-250	36	5,176	16%
25-100	66	3,571	11%
0.001-25	462	1,390	4%
Total	590	32,544	100%

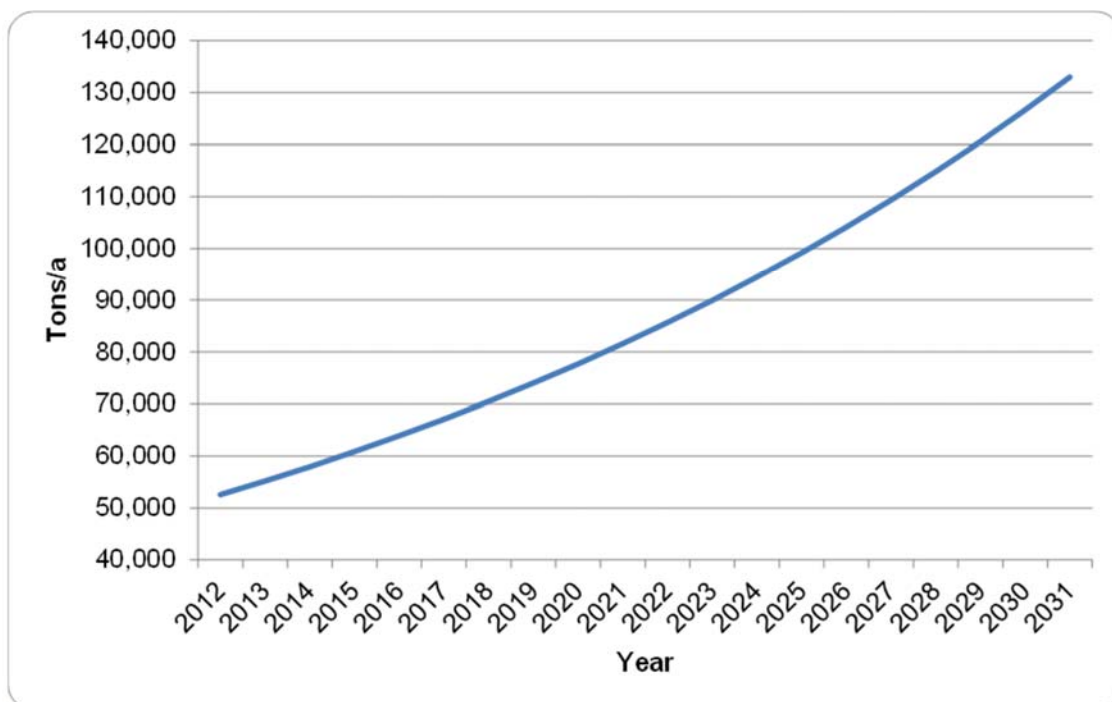




Source of tyres in Kenya



Forecasted quantities of waste tyres in Kenya





Final destinations of waste tyres in Kenya in 2011



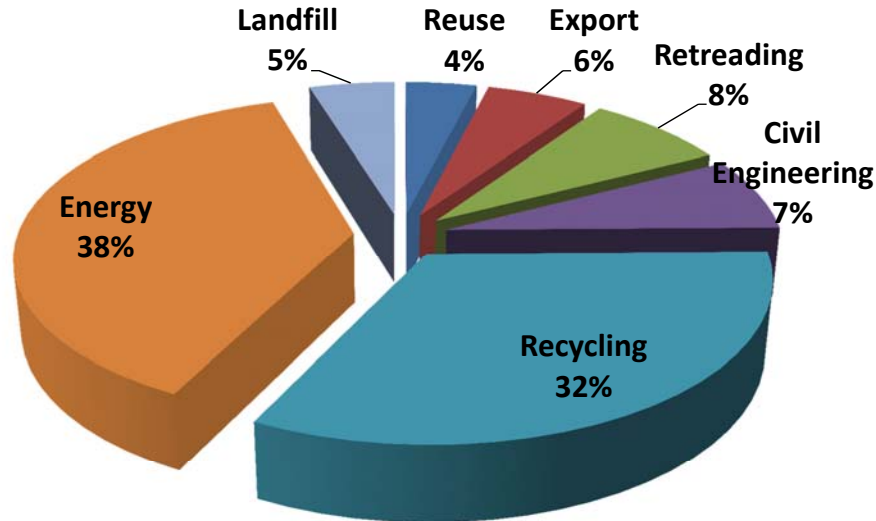
Options for Utilization of Waste Tyres

- Waste Tyre Recovery in Europe
- Opportunities in Kenya
- Waste Tyres as Alternative Fuel in Cement Kilns





Waste Tyre Recovery in Europe 2010 (source: European Tyre and Rubber Manufacturers' Association)



According to the European Tyre and Rubber Manufacturers' Association, the annual cost for the management of waste tyres is estimated at €600 million.

Considering an amount 3.3 Mio tons of waste tyres in 2010, average specific costs amount to 180 Euro per ton (app. 1.80 Euro for a small tyre and 9 Euro for a truck tyre)

Advanced material recycling solutions are fairly expensive and don't offer a realistic solution for Kenya at the moment





Cost of shredding of tyres

Size	Description	Application	Cost per ton* (US-Dollar)
2" (5.08 cm)	Clean cut. Ply & bead steel remains	Cement Kilns, Civil Engineering	\$10
2" (5.08 cm) minus	Minimal wire, cut beads removed by magnets	Industrial utility, pulp paper mill boilers	\$25
1" (2.54 cm) normal	Same as 2" minus with extra shredded pass	Power utility boilers (cyclone tspe)	\$10-\$30
1/2 " (1.27 cm) minus	Truly wire free, requires additional shredding equipment	Feed stock for crumb rubber, playground and sport field surfaces	\$25-\$55

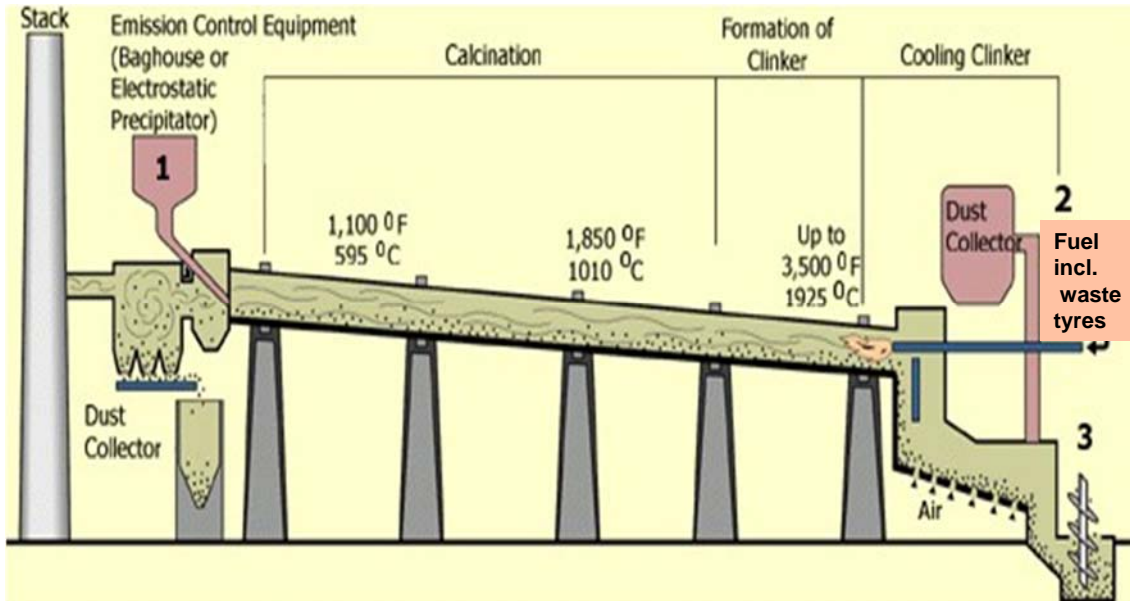


According to the results of the feasibility study for WMTK the coprocessing of Waste Tyres in cement kilns in Kenya at the moment offers the most recommendable solution





Co-processing of tyres in a cement kilns



Utilization of energy and material resources



Baling and shredding of tyres



Baled tyres



Shredded tyres



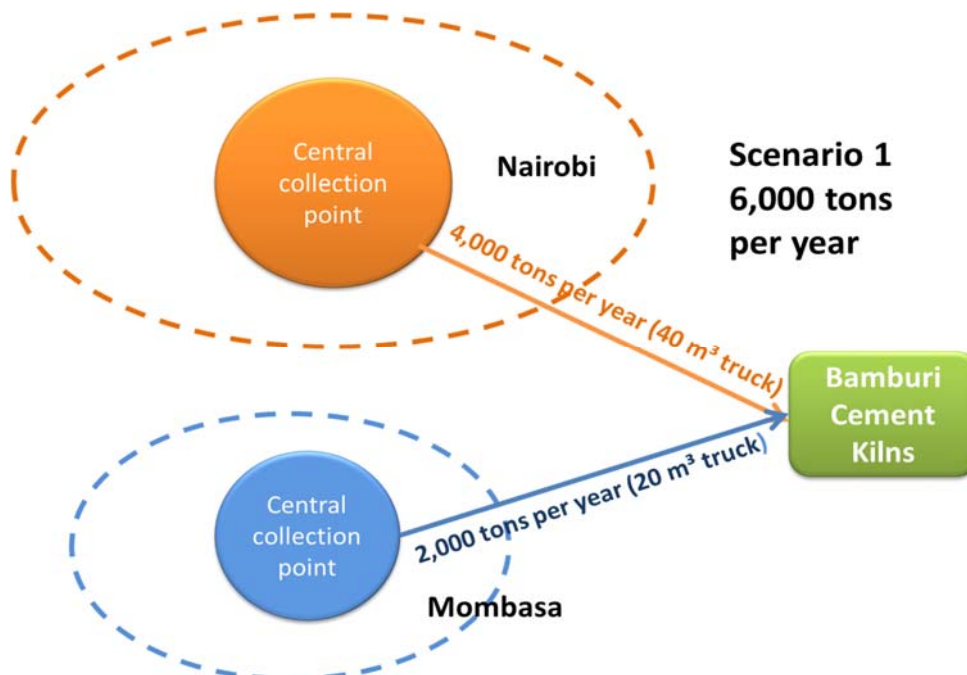


Cost Analysis of the Proposed Solution

- Costs / revenues have been analyzed in 2 scenarios for
 - a) collection and transportation of waste tyres
 - b) co-processing in the cement kiln

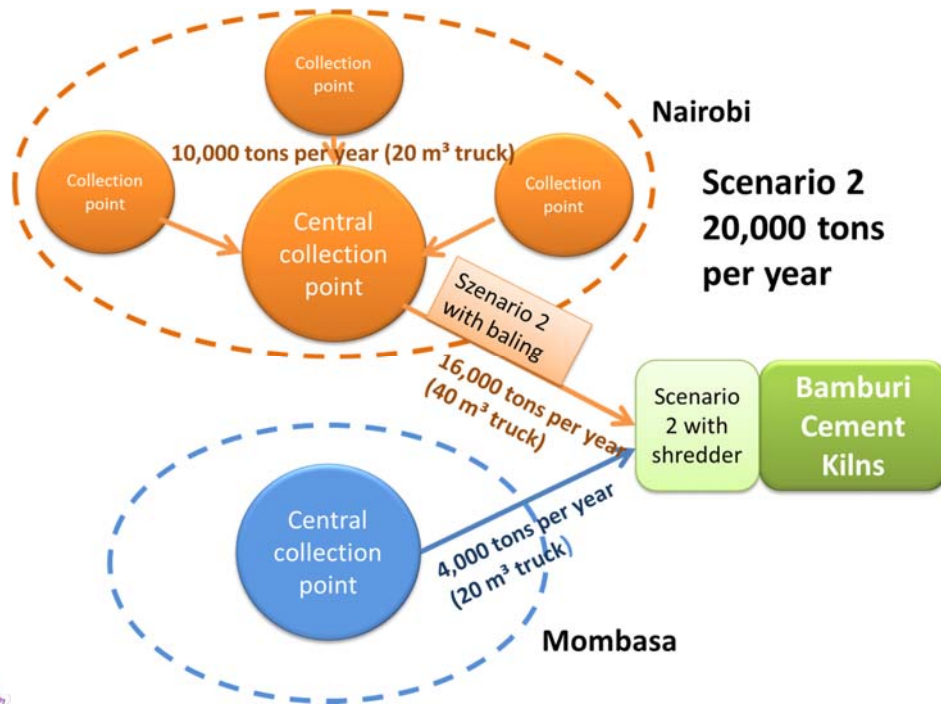


Scenarios for Feasibility Study: Scenario 1

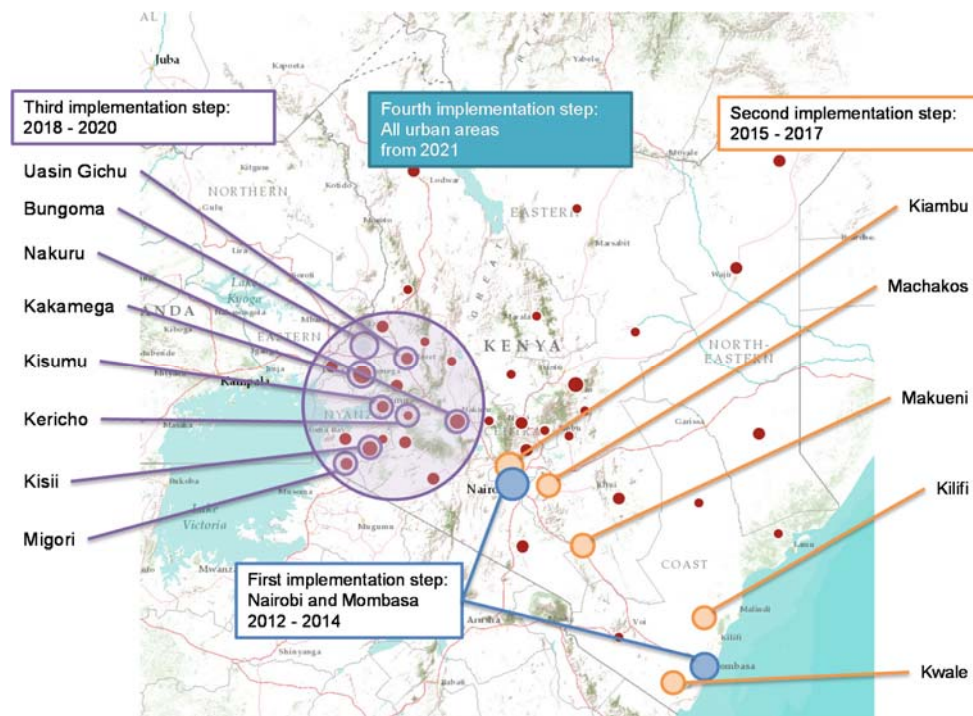




Scenarios for Feasibility Study: Scenario 2



Proposed Implementation Steps for WTMK





Cost Balance (overall system costs of the scenarios)

	Unit	Scenario 1			Scenario 2		
		Cost collection	Cost co-processing	Cost balance	Cost collection	Cost co-processing	Cost balance
Cost per ton	KES per ton	10,962	-7,158	3,804	9,340	-7,542	1,798
Cost per small tyre (10kg)	KES per tyre	110	-72	38	93	-75	18
Cost per large tyre (50 kg)	KES per tyre	548	-358	190	467	-377	90



Implementation of WMTK will start with scenario 1, whereas scenario 2 requires a well-developed collection system, which might take several years to be implemented.

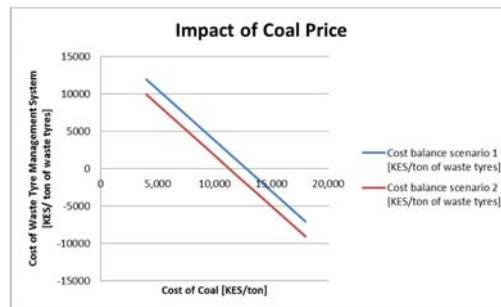
Therefore, at the beginning costs according to scenario 1 have to be taken into account.





WMTK costs are influenced by several factors, such as

- future development of coal prices
- prices achieved during tenders
- system efficiency and additional administration costs (i.e. charges of KRA for collection of import levy)



In order to include some financial buffer the following levies are proposed:

- 5 KES per kg tyre or tyre material, resulting in
 - KES 50 for a small tyre
 - KES 250 for a truck tyre

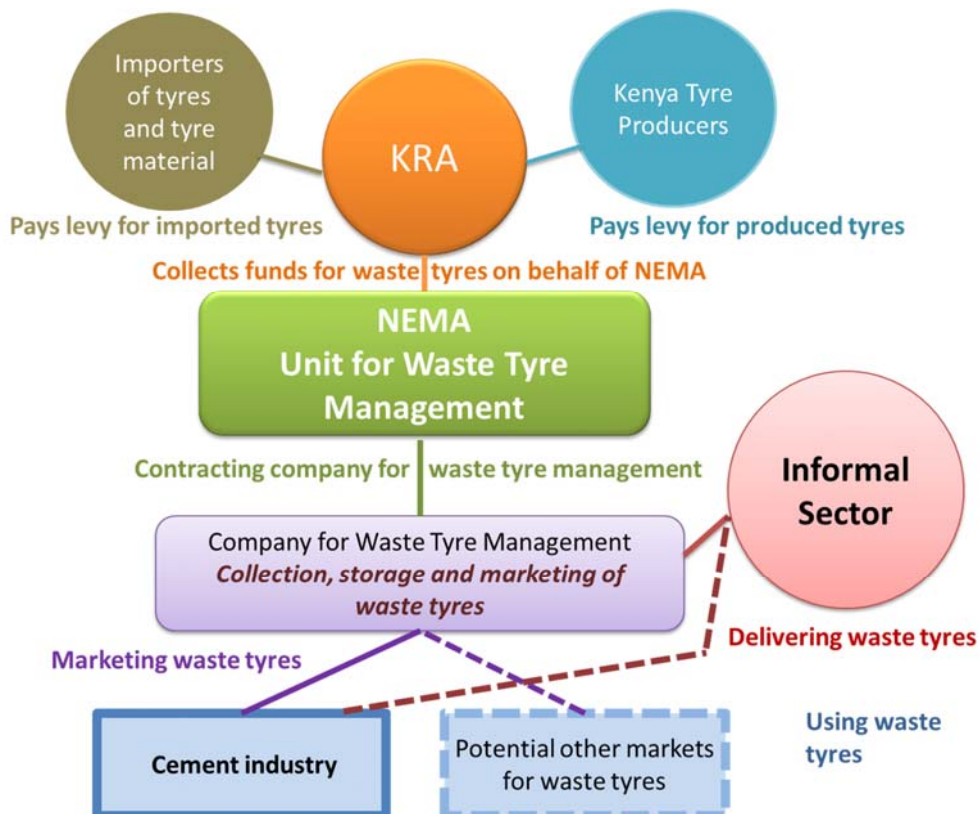
Assuming a selling price between KES 10,000 for a small tyre and KES 50,000 for a truck tyre the proposed levy would make up 0.5% of the selling price.





Proposed Organisational Model for WMTK

- Different models have been analyzed and discussed
- A system, which is exclusively management by the private industry has not been considered as feasible, mainly due to the very large no. of tyre importers
- In the proposed model private industry and state agencies share responsibilities





Thank you for your attention

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