Producer Responsibility in the Tyre Industry

End of life tyre-derived products *a Sustainable Resource*

F. Cinaralp, Secretary General

Tyre industry in Europe:

- 11 tyre corporate members
- Turnover: € 34 billion

  ETRMA members realise 66% tyre w/w TU;

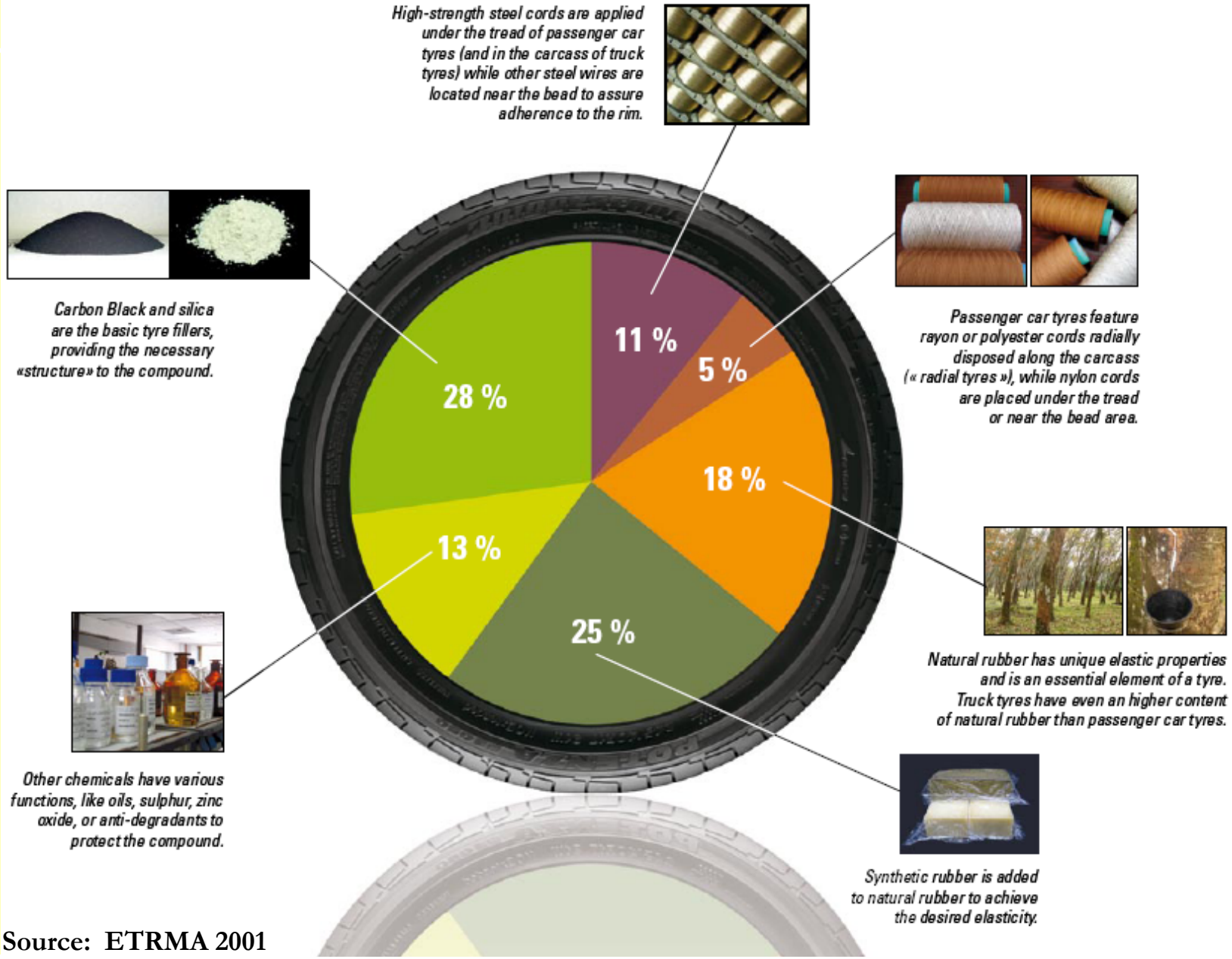
  46% is realised in Eu27
- Tyre market ~300 million tyres

  (2nd biggest market in the world)
- 93 producing plants
- 22 % of the worldwide production
- R&D: up to 4 % of annual turnover

Challenges for the Industry

- EU 27: No landfill

  as from July 2006 !
- Continuously guarantee ecological treatment
- Economically viable solutions
- Historic stockpiles
- Exports control



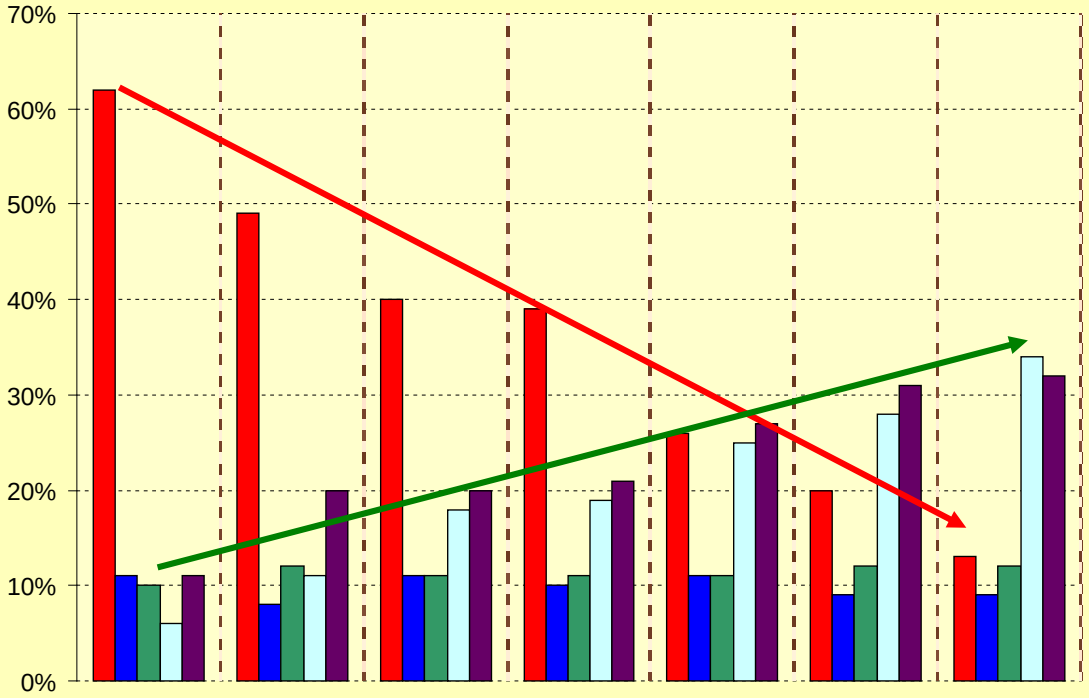
Source: ETRMA 2001

Environmental Impact of Tires during their Life Cycle

Source: ETRMA; based on Eco-Indicator 99 methods for each phase.

* Landfill is forbidden since 07/2006

Used Tyres Recovery in Europe 1994 - 2006



		1994	1996	1998	2000	2002	2004	2006
USED TYRES	Reuse/export	11%	8%	11%	10%	11%	9%	9%
	Retreading	10%	12%	11%	11%	11%	12%	12%
ELT	Material Recycling	6%	11%	18%	19%	25%	28%	34%
	Energy Recovery	11%	20%	20%	21%	27%	31%	32%
	Landfill	62%	49%	40%	39%	26%	20%	13%
	Number ELTs mgmt co	1	3	4	4	7	11	13

The European Tyre Producers Strategy: Promotion of Producer Responsibility

T.I. objectives:

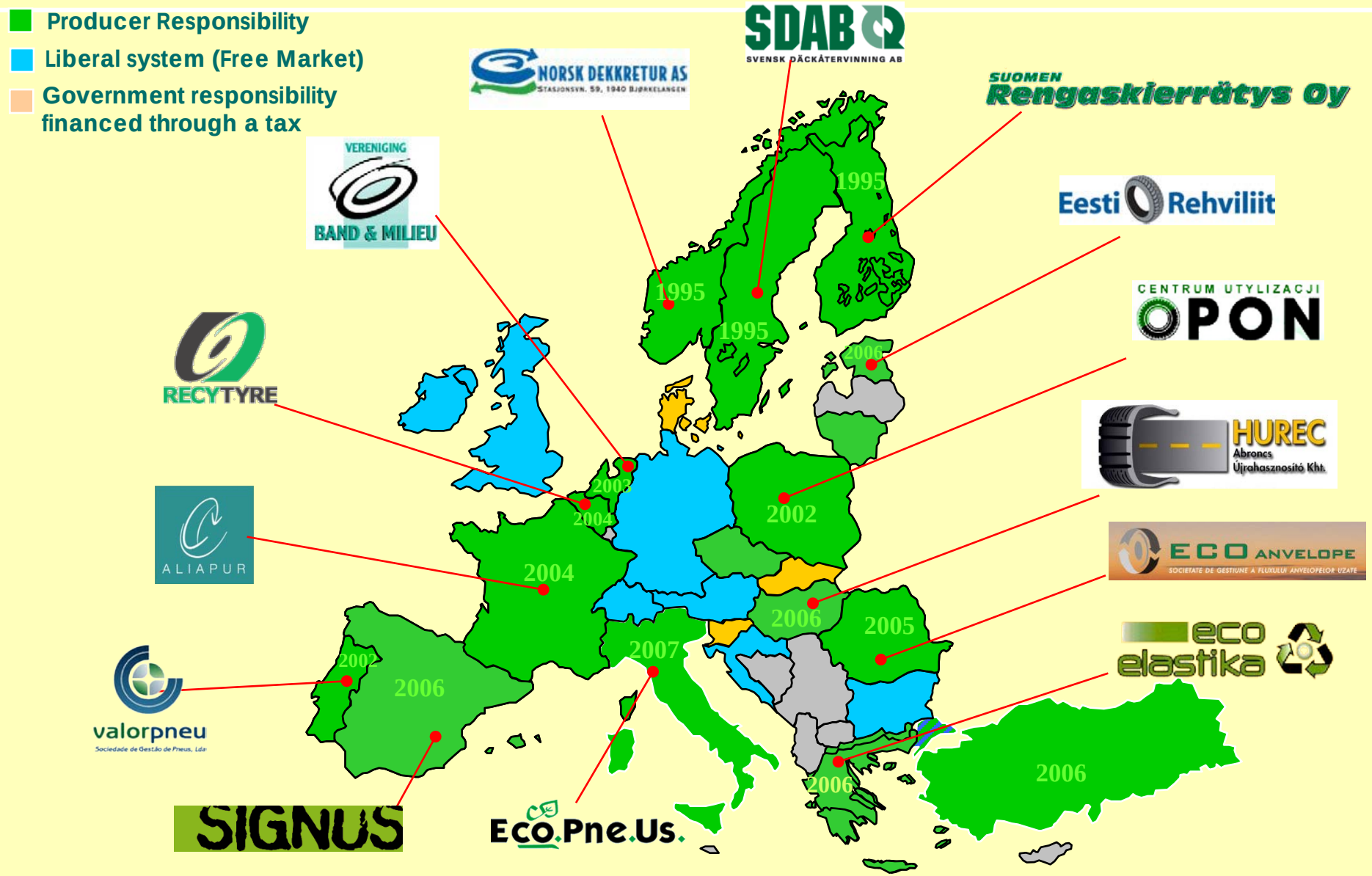
- *To promote environmentally friendly & economically sound and sustainable recycling & recovery solutions*
- *Not to discriminate between **recycling processes and recovery options**.*
- *To promote R&D programs to develop new and more efficient recycling & recovery channels **(~5 millions € spent/year)***

Conditions of success:

- *Statutory regime setting PR*
- *Creation of an ELT management not- for-profit company - for managing, collecting and further treatment*
- *Having a dedicated financing scheme (separate line on invoice) .*

***Allowed an** efficient & transparent communication with local authorities ; securing 100% traceability within the ELT value chain*

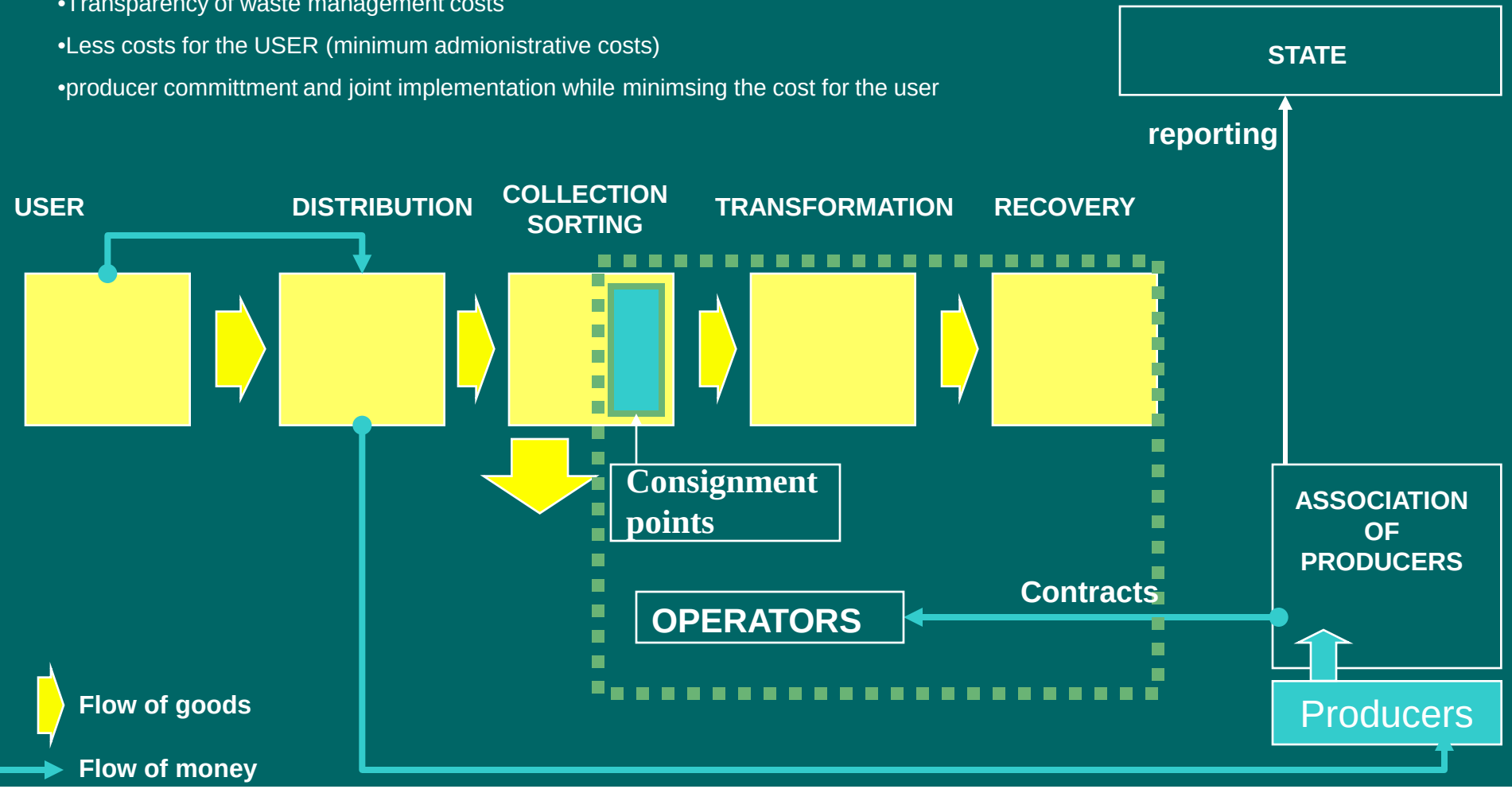
Country specific implementation and ELT management companies



The SYSTEM promoted by TI IN EUROPE, on a VOLUNTARY basis

Mandatory TAKE BACK and Voluntary FUND

- Transparency of waste management costs
- Less costs for the USER (minimum admionistrative costs)
- producer committment and joint implementation while minimsing the cost for the user



REPORTING MECHANISMS TO NATIONAL AUTHORITIES under Producer Responsibility

➡ **performed by the ELT management company, on behalf of the tyre producers**

Each year, authorities being in general informed by:

1) ***Producers***: about the quantities (per type, units and tons) they sold on the national market during the previous year.

2) ***Producers***: about the quantities (per type and tons) recovered the previous year and the way they recovered them (including export).

3) ***Collecting companies***: where required, about quantities collected during the previous year and destinations (recovery routes).

4) ***Recovering companies***: about the quantities recovered and destinations during the previous year (including quantities in stock).

Authorities (e.g. Environmental Ministry/Agency) in several countries are publishing relevant overall reports.

What are the recovery routes for end of life tyres?

Criteria for **sustainable** recovery routes:

- Intrinsic technical properties of the tyre
- Full respect of environmental and health requirements
- Contribution to saving natural resources
- Economic viability → product/process standards

The main uses for ELTs include alternative sources of energy and materials:

- Energy Recovery — Alternative Fuel (mainly for cement kilns)

31,6%

(~ 1023 kt)

- Material Recovery — Construction Material

34,1%

(~ 1105 kt)

Crumb or Ground Rubber

Substitute for anthracite in steel plants (Electric Arc furnaces)

ELT Derived products: material recycling

Draining capacities and mechanical properties are used in **civil engineering** applications

6% (~162.000t)

Benefits

Tyre are
- lightweight
- good insulators
- permeable
- Noise and Shock absorbent
- long lasting

Environmental impact

comparable and lower to alternative construction materials

An example: Properties of shred used in Civil Engineering :

Applications : Tire-Derived Aggregate (TDA)

- Size : 5X5 to 30X30

- Weight : 1/3 to ½ weight of soil
(1 Ton of shred 5X5 = 2,7 Ton aggregate)

- Volume : 1 m3 = 100 PC tyres

- Drainage : 10 times better than well graded soil

- Insulation : 8 times better than gravel

- Lateral foundation wall pressure : ½ that of soil

Study on the Use of ELT derived products in steel plants

•**Use of ELT derived products in steel plants**:

- Tyres contain Carbon and Iron that may be used partly or entirely to substitute the use of anthracite in the ovens
- **1,7kg Tyres = 1 kg of anthracite**
- **unlimited capacity**; **current** capacity used **7000 t**

• **Benefits**

Used as a source of carbon & steel during the manufacturing of steel

• **Environmental impact**

Positive environmental impact concerning dust and gaseous effluents;

overall there are no significant differences in the overall environmental impact due to the use of Tyres or anthracite.

ELT Derived products: material recycling

Powder/ Crumb usage **21% (~567.000t)**

ELT Derived products: material recycling

Applications

- Moulded Rubber Products : 12% (~324.000t)
  Wheels for caddies, dustbins, wheel barrows, Lawnmowers, urban sign posting
  ➔ Replaces rubber (natural and synthetic)

- Soil applications : 8% (~216.000t)
  Flooring (playgrounds, sports fields)
  Shock absorbent mats (in stables, at schools)
  Paving blocks; Roofing materials (in place of tuiles/ardoises on roofs)
  ➔ Replaces sand, gravels, cement, etc

- Rubber modified asphalt : ~ 1%
  Make use of the characteristics of rubber = elasticity, noise absorbing…
  ➔ Increased road life span, reduced noise emissions, increased safety on wet driving conditions

Environmental impact:

Sport floors with ELT granulate infill have no impact on the aqueous environment or human health when applied indoor or outdoor (recent studies in F, NL, CH)

Standardisation:

European (CEN) Standards under development: TC 217 (Sports Areas) and PC/366

ELT derived products as alternative fuel

overall 31,6% (~ 1 023 kt)

Used for its calorific power mostly in cement kilns **27% (~812,000t)**

Other uses:
- ° Industrial boilers
- ° Co-incineration with municipal wastes
- ° Power stations

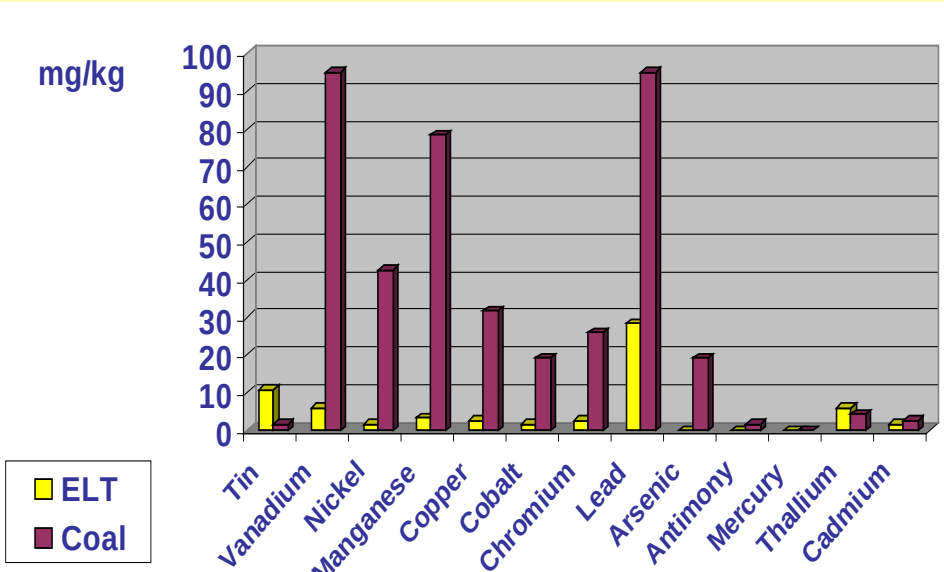
Properties:

- 1 tonne of tyre = 1 tonne of good quality coal = 750 Kg of fuel
- Calorific power of a tyre = 1 passenger car tyre = 7.6 L of fuel

Impact on environment :

Heavy metals content
much less than coal

regarding sulphur :
in the same range



Source : VW Kraftwerk GmbH Labor

ELT derived products as alternative fuel

"Biomass effect" of ELTs combustion

- 20% of the weight of ELT is latex
- Latex is polyisoprene (C5H8) : it is composed of 88 of Carbon atoms

→ **The complete combustion of 1 ton of ELTs is equivalent to 647 Kg of CO2**

Energy Content and CO2 Emissions from Fuels:

Energy Content and CO2 Emissions from Fuels:

Fuel	Energy (GJ/t)	Emissions	
		$kgCO_2/t$	$kgCO_2/GJ$
Tires	32.0	2,720	85
Carbon	27.0	2,430	90
Pet coke	32.4	3,240	100
Diesel oil	46.0	3,220	70
Natural gas	39.0	1,989	51
Wood	10.2	1,122	110

Source: World Business Council on Sustainable Development (WBCSD) 2005 – CO2 Emission Factors of Fuels

Thank you for your attention