



Recycled Tyre Materials and **Ci . cular** Economy

Dott. Ettore Musacchi, President

Dr. Valerie Shulman, Secretary General

ETRA : European Tyre Recycling Association

- ❖ **ETRA began activities in 1989 and was funded as an EU project in 1992**
- ❖ **ETRA, the European Association, was founded in 1994**
- ❖ **ETRA is an independent, member-driven organisation devoted exclusively to the material recycling of tyres**
- ❖ **Its mission is to develop tyre recycling as an environmentally sound and commercially sustainable European industry**
- ❖ **Its key objective is to develop and advance policies supporting the industry leading to the creation of new markets or expansion of existing ones**

ETRA within the EU

- ❖ ETRA is one of over 600 European Associations – 50 of which focus on one or more waste stream, today, ETRA focuses on 3
- ❖ One of the oldest European associations, ETRA is one of the smallest e.g., plastics = 37,000,000 tonnes p/y, tyres \pm 3,200,000 tonnes p/y
- ❖ Until recently, 87% of ETRA members were SME or Micro companies, but that has begun to change
- ❖ ETRA has become a voice of independent tyre recyclers and works with other recycling organisations towards Circular Economy goals
- ❖ To achieve these goals, ETRA works closely with 36 organisations

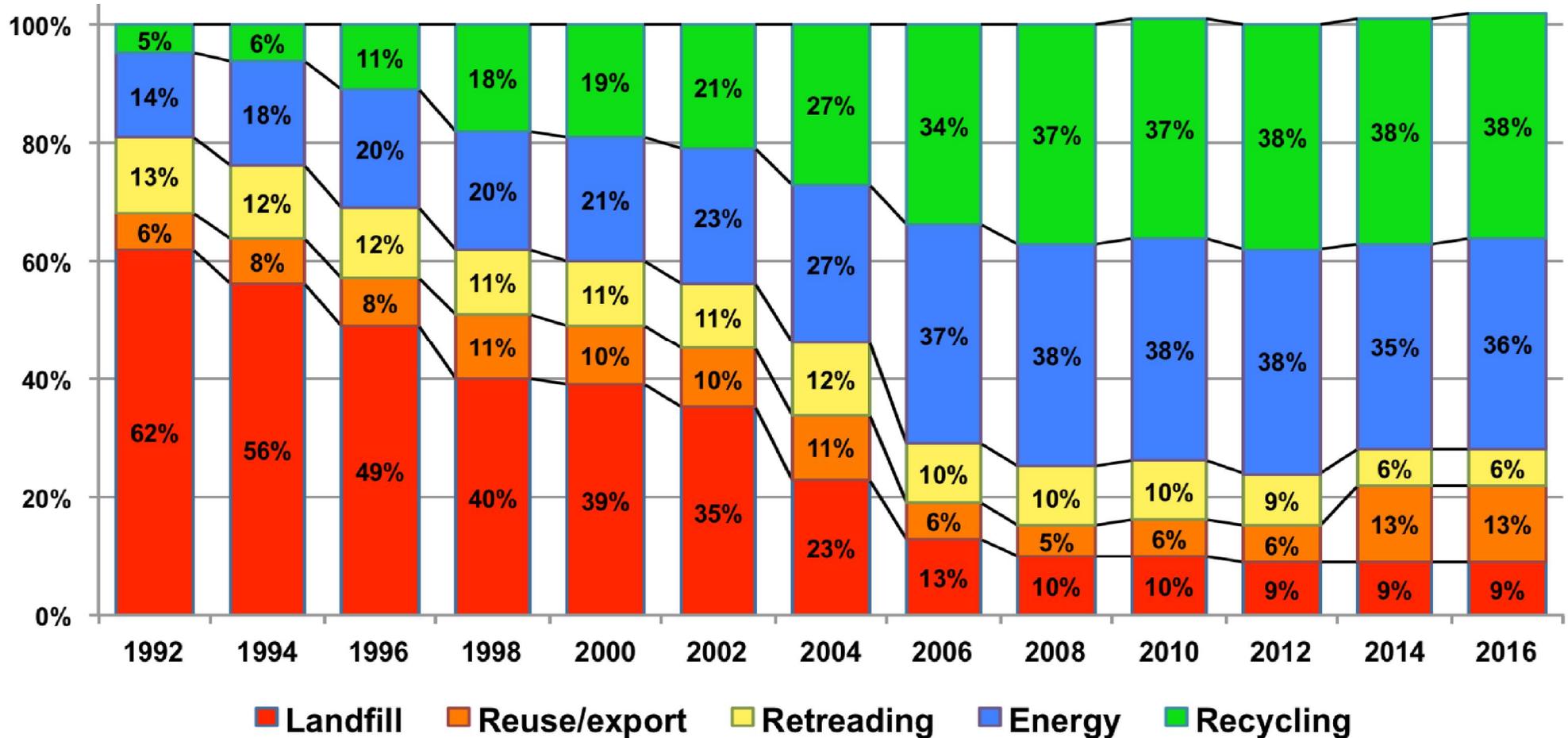
Patterns of valorisation

❖ As here, there are four accepted means of valorisation :

- Retreading/regrooving : 6% declining rapidly
- Reuse (and export) : 13% increasing rapidly
- Material recycling : 38% stabilising and increasing
- Energy recovery : 35% stabilising (3 pt fluctuation)
- Landfill : 9% stabilised

❖ Recycling quantities have stabilised during the past 5 years – although both the end-users and specific markets continue to change, offering many new options and opportunities

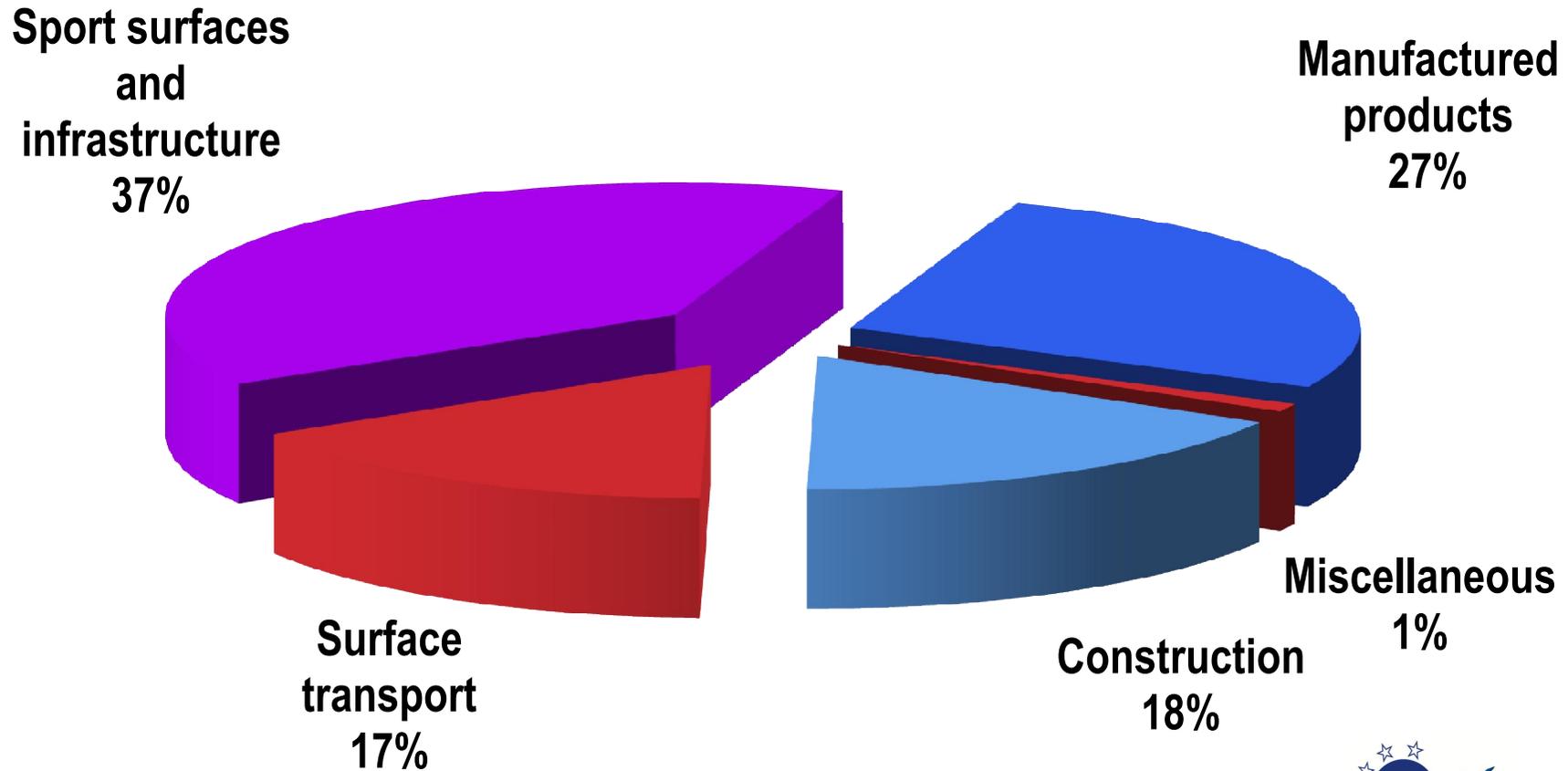
Valorisation Routes 1992 - 2017



Recycled Tyre Materials (RTMs)

- Whole tyres used primarily in bales : 10%
- Shred/chips primarily for drainage, tracks: 18%
- Granulate, less in sports, increasingly in moulded elements for transport : 53%
- Powders : 10%
- Specialty powders, i.e., devulc, recovered carbon black, thermoplastics, etc. : 8%
- Steel and textile : 1%

Principal market sectors



The Obstacles to Growth

- Tyre availability : Increasing quantities are collected, BUT vast amounts are being exported outside of the EU for burning
- Uncertainty about the content of the +30% of tyres imported from Asia
- Uncounted OTR tyres are stored at wharves, in mines, etc. and not included in the sourcing data
- Germany has proposed several bans on using RTMs in construction
- The ECHA potential constraints on the use of SBR in turf (**talk more later**)
-and others

About the title

You may have noticed that the title is written as **CI . CULAR** instead of **CIRCULAR** to underline that something is missing to implement the Circular Economy properly.

- Maybe it is the “R” for “Recycling”
- Maybe it is the “I” for “Innovation”
- Or perhaps the “L” for “Liabilities”

Despite the play on words, something is missing and some reflections could be useful.

Circular Economy and Tyre Recycling

- ❖ The impact of the Circular Economy on tyre recycling is, at least theoretically, excellent.
- ❖ However, in practice, there is a lot to do and we are not sure to succeed.
- ❖ Through the years there have been a number of norms and policies that were designed to support recycling but did not work, or were not applied properly so that they could succeed.
- ❖ Future impacts will depend upon the actions that we will put into force to ensure that the package is implemented properly.
- ❖ At the moment there are important **challenges** to face

1 - EPR

- ❖ **Extended Producer Responsibility was designed to ensure the sustainable treatment of wastes by providing financial support to the process.**
- ❖ **It was implemented by the creation of sectoral organisations to collect and manage waste streams with a financial contribution from consumers.**
- ❖ **However, the actual work of the collection, transport, allocation and treatment of the wastes are most often sub-contracted to other companies - (SMEs) who often do not benefit from a fair share of the eco-fees, that is not negotiable.**
- ❖ **Some EPR organisations appear to have a conflict of interest in regard to material recycling vs virgin materials and products.**

2 – Green Public Procurement

- ❖ The rate of material recycling for tyres grew from 5% in 1992 to ±38% in 2014 and holding, could continue to grow in future
- ❖ In order to support a new spurt – the status quo will have to change
- ❖ Until today there have not been sufficient economic, political or financial incentives to support a new spurt
- ❖ Material recycling for tyres is not supported by targets or parameters
- ❖ GPP is beginning to provide the necessary stimulus and motivation for a new RTM growth spurt through the COM(2011)896, the new Criteria for transport, GPP Product Groups, and the Parameters for Road design, construction, maintenance, etc.
- ❖ It seems a good beginning, but there have been others in the past. Will this be the right time?

3 - The Proximity Principle

- ❖ More and more post-consumer tyres are exported in bulk outside of the EU for uncontrolled incineration, reducing the opportunities for recycling growth
- ❖ Increasing quantities are being moved across Europe from one end to the other, often for treatment - ignoring the proximity principle
- ❖ The consumer eco-fee is often used indiscriminately for these actions instead of their intended use in support of developing more local material recycling and other treatment facilities
- ❖ The Proximity Principle reduces CO² related to waste management while increasing local employment and product outputs – ignoring the proximity principle increases CO² and fuel consumption and reduces local recycling

4 – Research and Development

- ❖ As noted earlier, until recently 87% of tyre recyclers were SMEs and micro companies – limiting their ability to support vast research
- ❖ The EU offers many funding opportunities with a variety of research programmes and projects – which are the primary source of funds for the evolution of innovative materials, products and applications
- ❖ Governments and their agencies, universities, research facilities and the marketplace – including equipment manufacturers have, have joined in our projects and remain active when they are completed
- ❖ But we could reduce reliance on the Commission if even 10% of the financial contribution from eco-fees were allocated to R&D .

The impact of fake news

- A 2016 Dutch television programme talked about health risks from playing football on artificial turf infilled with recycled tyre rubber - because it contains cancer-causing PAHs.
- After the TV programme other media raised the issue, pushing the Commission to seek clarifications from ECHA.
- ECHA opened a consultation involving other bodies to raise concerns. These bodies posed simple questions and requests for clarification, but, it seems that it was taken as proof of an actual risk!
- The concerns became an assumption, a tautology, that there is a risk.
- But nothing was said about the original product – the tyre!!

PAHs

- ❖ **Rubber compounds are complex mixtures containing many ingredients that undergo transformations during vulcanisation**
- ❖ **Vulcanisation is a chemical-heat process that modifies the polymer chains in rubber to improve their elasticity and strength**
- ❖ **PAHs facilitate the vulcanisation process. They are primarily contained in oils, which are plasticisers for the rubber compounds – and they are not released from the polymer matrix.**
- ❖ **The allowable levels of PAHs in tyres was reduced as of 2010 and the granulate found in 95% of sports fields tested reflect the reduced amounts -**

A bit about PAHs

- 1) The concentration of PAHs in rubber granulate is a consequence of the use of PAHs in the production of new tyres.
- 2) There is an established trend to reduce PAHs in tyre production that has successfully reduced the residue in granulate
- 3) As a majority of rubber granulate is produced by mechanical means, without physical changes to the material, it is not clear how the PAH concentration in rubber granulate can be further reduced without first reducing the content used in the manufacture of new tyres

..... But that question has not been asked

ECHA Restriction Report

- RIVM and ECHA just published a Report for a revised restriction of the PAH concentration in recycled rubber granulate used in turf.
- The document does not define why it is necessary to proceed with a reduction in the PAH concentration only in the granulate. It does not go beyond describing a generic concern for a possible risk to human health.
- The report explains that the proposed limits (17 mg. or 6,5 mg of PAHs) may bring an estimated reduction of 2 to 12 cases of cancer risk in the EU over 10 years.
- Recall that recycled tyre granulate is a derivative product produced from tyres by a mechanical process – without transformation of the ingredients
- Shouldn't we begin with the original product – the tyre?

ECHA Restriction Report

- ❖ In the Report the concentration of PAHs in rubber granulate used as infill is discussed primarily in terms of the quantity contained in the rubber but not as an impact on the environment and/or human health.
- ❖ There is currently no scientific evidence that there is a migration of PAHs from rubber granulate to the environment or humans.
- ❖ We may seek to minimise the amount of hazardous substances in infill, but the level considered safe has not been scientifically determined over time and could be cause for further costly and unproductive activities
- ❖ We propose to look more closely at the source – the tyre - and to explore the secondary raw materials produced through recycling – by various methods to determine the PAH residues and their impact

The ECHA Restriction Report

- The procedure began in 2016 and will end in 2019 with the new limit entering into force in 2020.
- However results are not certain. Indeed, the report identifies three problems connected to enforceability:
 - Differences among member states in terms of material consistency, production parameters, installation / use guidelines
 - Common understandings about the material across the EU
 - Absence of EU a harmonised methodology for PAH extraction and analysis, tolerance levels
- Meanwhile less artificial turf has been installed, fields are idle and recycled tyre materials have lost a major market
- And we still haven't explored the source of the problem - Tyres

Conclusion



Here a civilised population insisted in applying a linear model of exploitation of natural resources until they depleted them and extinguished human beings.

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Dott. Ettore Musacchi
ettore_musacchi@yahoo.it