Current Challenges for the tyre recycling Sector

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ETRA

ETRA European Tyre Recycling Association

- Founded in 1994 ETRA is an independent, member-driven organisation devoted exclusively to material recycling of tyres
- Its mission is to develop tyre recycling as an environmentally sound and commercially sustainable European industry
- Objectives are to develop and advance policies supporting the industry
  - To identify, develop and expand markets;
  - To devise and implement professional standards;
  - To prepare and promote guidelines for materials, products, applications;
  - To offer communication links with governments and industries

Membership is open to public and private sectors

Tyre recycling in the EU

- Each year in the 28 EU States and Norway, ± 3,200,000 tonnes of post- consumer tyres are permanently removed from vehicles and defined as waste
- An additional 100,000 tonnes of OTR tyres are also discarded
- All of these tyres must be treated in a sustainable way
- Material recycling, energy recovery and retreading are the most prevalent treatments in the EU
- Together, they account for ±90% of annual arisings

Tyre management systems

- A variety of tyre management systems operate in the EU
- While the systems vary, they successfully collect significant quantities of tyres for use or treatment – approaching 90% in 2013, 80% today
- Data indicate that ± 38% of tyres collected are subsequently treated to attain material outputs, ± 35% somewhat fewer are used for energy
- The remaining are retreaded (±7%) - or exported (±11) – up from less than 4% in recent years

4 Basic management systems

Producer responsibility : legal responsibility for 100% of tyres that arise

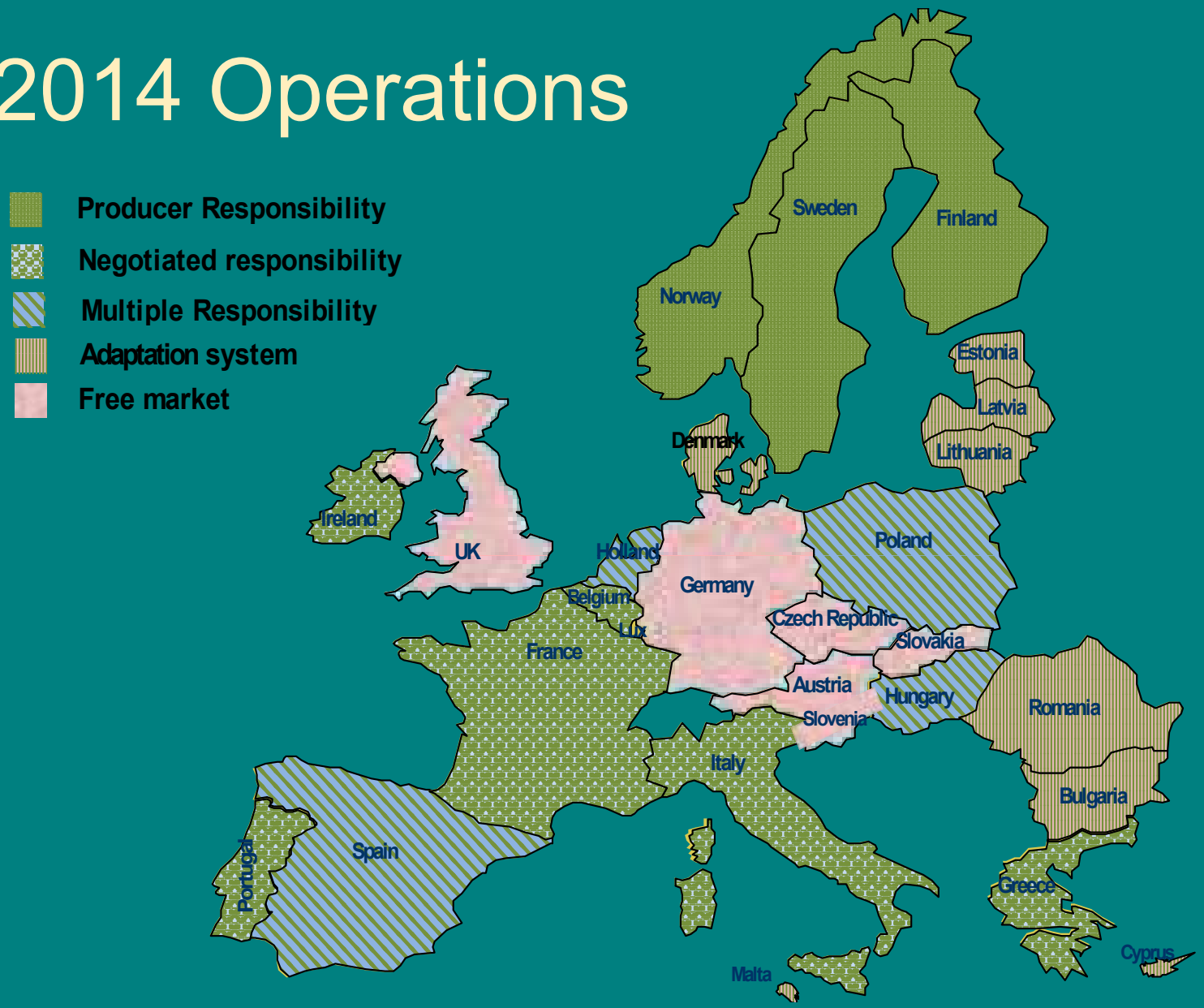
Multiple responsibility : more than one entity with legal responsibility for tyre management

Negotiated responsibility : legal responsibility for only a specified percentage of tyres (often below 100%)

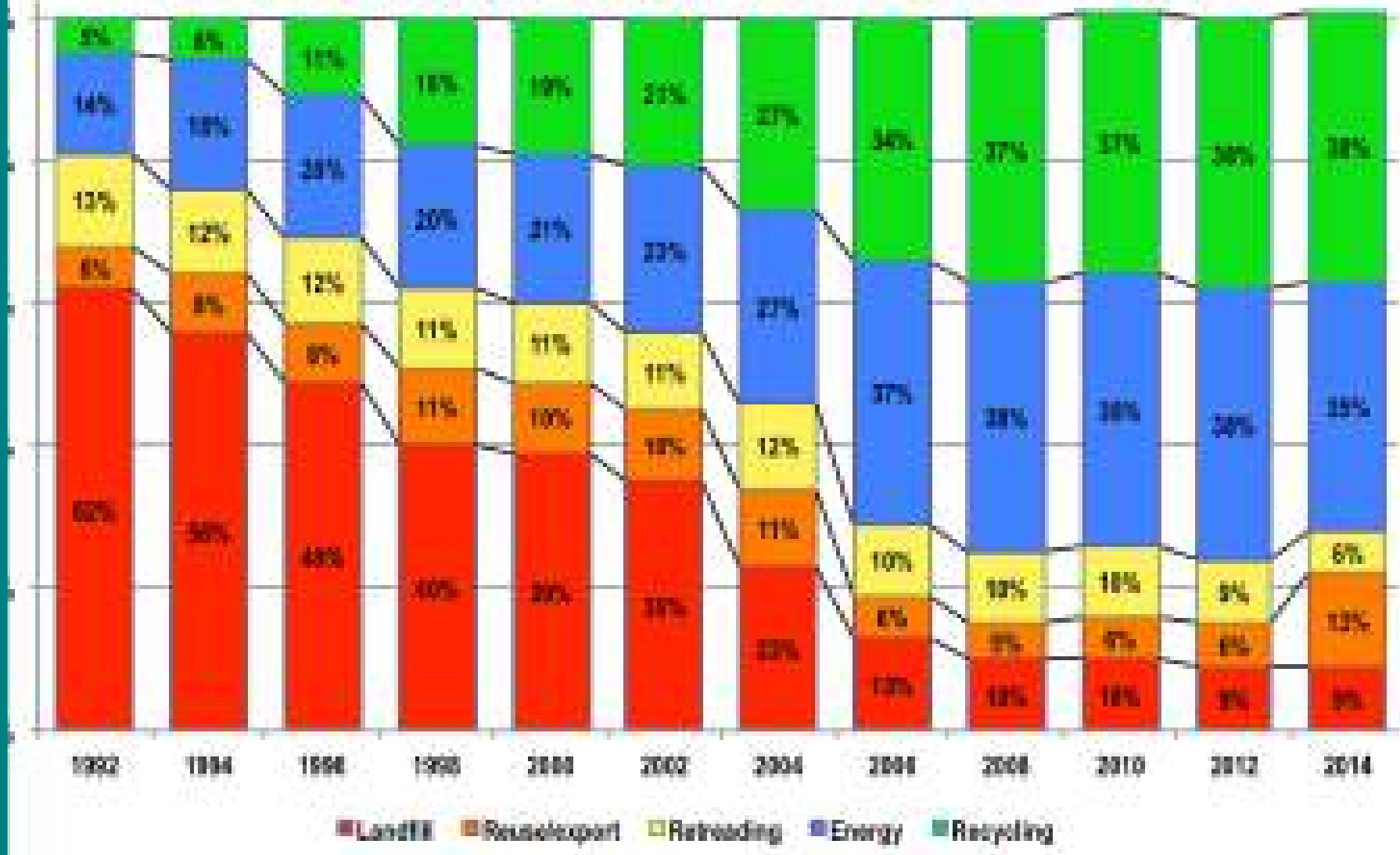
Free market : no legally defined responsibility for tyre management

OR an **Adaptation,** any combination of the above – and/or a tax, fee,

2014 Operations

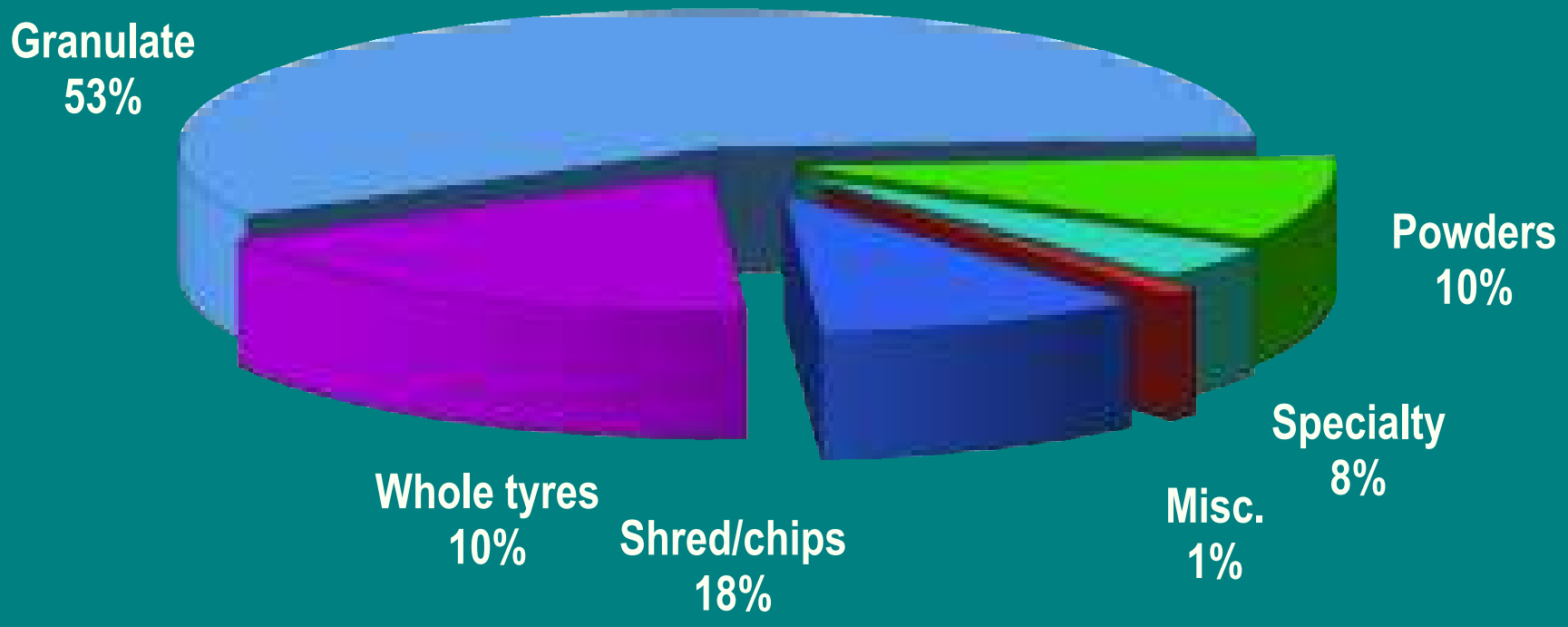


Valorisation Routes 1992 - 2014

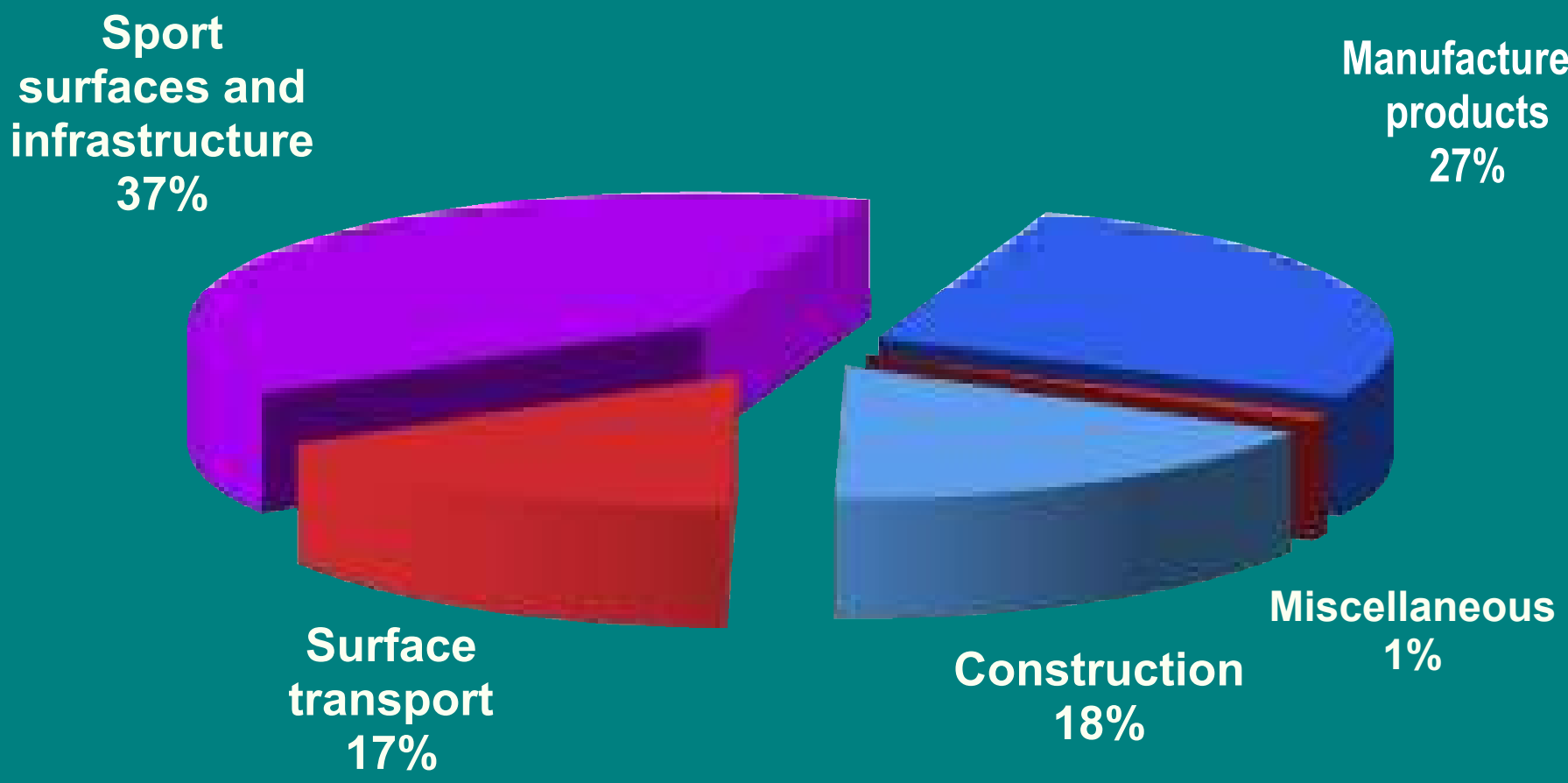


Recycled tyre rubber materials

±1,500,000 tonnes of tyres were processed for material outputs



Principal market sectors



Characteristics of RTMs

- RTMs are soft, tough, flexible and elastic
- RTMs have excellent insulation characteristics - reducing the impacts of vibration and sound, and under certain circum-stances, current as well
- RTMs are moisture resistant as well porous, allowing water to drain freely
- RTMs retain the characteristics of a tyre on the road !
- Used on road surfaces, RTMs can reduce vehicle skid, glare and tyre spray

Characteristics (cont)

- Anti-static
- Non-toxic
- Waterproof and anti-slip
- Resistant to Ultra violet rays
- Perform well even at climatic extremes (cold / heat)
- Highly resistant to both abrasion and impact
- Absorb and deflect pressure – reducing injury to the surface and to the falling object

The use of the Rubber

- Rubberised Asphalt

The use of the Rubber

- Rail products

Turin, Via Rossini

Installation of the sound-absorbing panels

The floating mass system

1) Crushed stone from quarry
2) Reinforced concrete subfoundation
3) Layer of recycled rubber
4) Reinforced concrete foundation
5) Prestressed concrete sleepers
6) Second layer of reinforced concrete
7) Rubber profiles along the rails
8) Road paving made of bituminous conglomerate

Turin, Via Rossini

Concrete casting with steel reinforcement and laydown of sleepers and rails

Floating mass system with slabs prefabricated

1) Crushed stone from quarry

2) Reinforced concrete foundation

3) Elastomeric rubber mat

4) Prefabricated reinforced concrete slabs

5) Paving slabs prefab reinforced concrete

6) Stone pavement (basalt cubes)

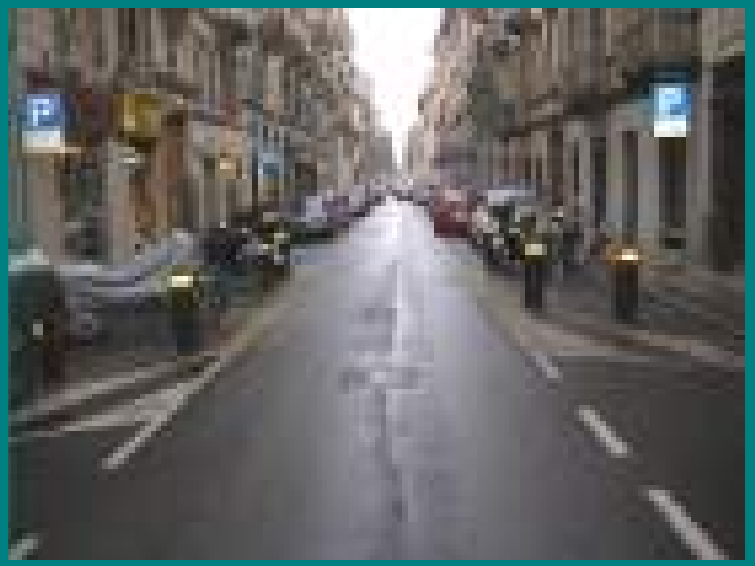
7) Rubber profiles along the rails

Turin, Via Rossini

The final result of the two systems used

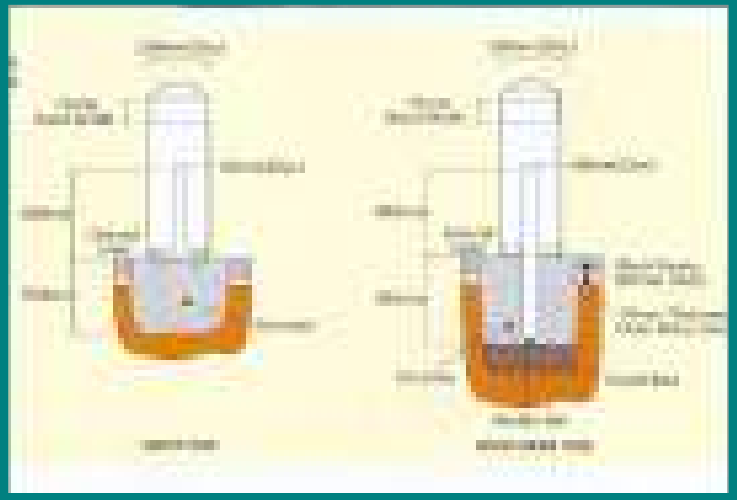
The use of the Rubber

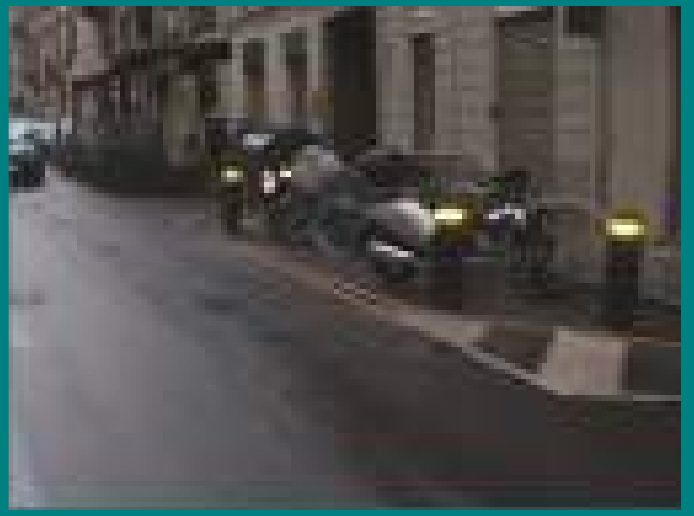
- Urban Furnitures



Urban Equipment

Turin,Via San Massimo
The City tested the positioning of recycled rubber buffer as speed bollards and to safeguard the walkway.





Brussels

CURBS


BARI
MATERA
IRSINA

Bollards

The use of the Steel

- Concrete

Anagennisi (Fp7)

Innovative Reuse of All Tyre Components in Concrete

- **Call: FP7-ENV-2013-two-stage (Turning waste into a resource through innovative technologies, processes and services).**
- **Coordinator: The University of Sheffield (UK)**
- **17 partners, 7 work packages**
- **Total cost ~€4.5m**
- **Duration: 42 months**

SME
HEI
Trade organisation
End user

Anagennisi objectives

Develop solutions to reuse all tyre by-products in concrete applications with reduced environmental impact through

- **Highly-deformable rubberised concrete**
- **Reused Tyre Steel Fibre (RTSF) concrete**
- **Reused Tyre Polymer Fibre (RTPF) concrete**
- **Mini-Demonstration Projects in different environmental & economic conditions using the developed materials/applications.**
- **Developing/implementing standardised design guidelines and life cycle assessment (LCA) and life cycle cost analysis (LCAA) protocols.**

Joint-less Slabs on Grade

Precast concrete elements

Applications (1)

Wet cast super-flat industrial ground slabs

Applications (2)

ECOLANES project: Roller compacted concrete (RCC) pavements, industrial floors, car parks etc

Applications (3)

Pumped and sprayed concrete

- tunnel linings
- ground stabilisation, etc

The use of the Textile

- Insulating Panels

Insul-ECO Project

- CIP-EIP Eco-Innovation 2013
- Project N. 630185
- Coordinator: ETRA
- Four Partners
- Full title: Eco-innovative insulating thermal and acoustic panels made with recycled textile fibres
- Total costs: Euro 1.617.612
- Grant: Euro 808.806
- Duration : 36 months

Objective of the project

- Design and establish an industrial scale production line to be able to produce 1.500m2/day of insulating panels.
- Optimise the product geometry to develop a range of products built upon the inherent characteristics and properties of the INSUL-ECO panels.
- Elaborate a Marketing Plan as well as a Business Plan.
- Improve the environmental performance and better use of natural resources.

Example of application

The use of the Rubber

- Artificial Turf


TORINO

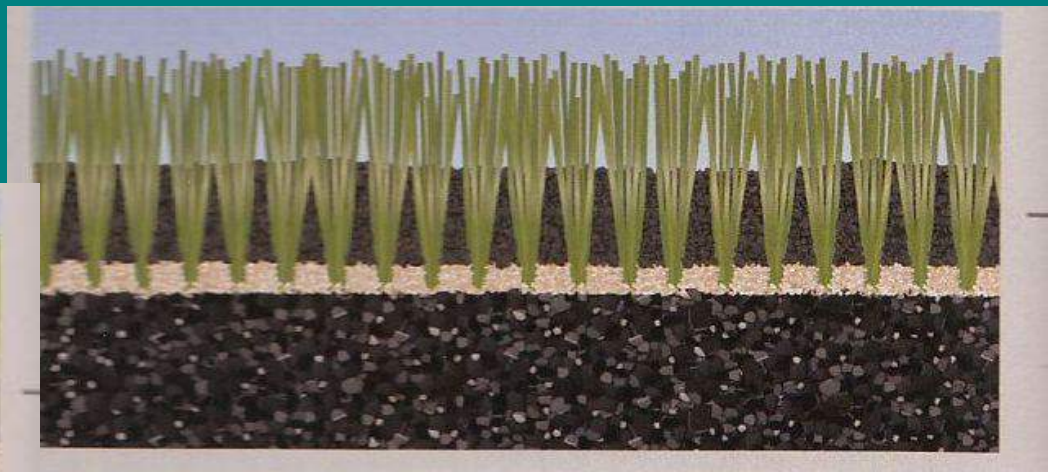

TORINO
always on the move

4 advantages

What is an artificial turf?

Traditional

with elastic layer underneath



Recycled SBR granulate is the best infill material because:

- absorb the shock
- has a constant behaviour
- is long lasting
- can be recycled

Biomecanic performances

The Challenges - 1

How it is

The percentage of material recycling grew until attaining 37-38% and could continue growing but, there are not incentives nor support from the law.

How it should be

Material recycling, fixed in the 5 step hierarchy, should be supported by parameters in order to be applied more.

The Challenges - 2

How it is

There are attempts, either through the media or through proposal of regulations to limit the use of RTMs, spreading fear of a danger for human health.

How it should be

Any request for a limitation of RTMs should be supported by studies that analise the risk and compare it to the risk of alternative products (that are often produced from similar but virgin resources).

The Challenges - 3

How it is

Draft Model Administrative Rules Technical Building Regulations [M-VV TB], submitted to DG Growth on 20 July 2016 contains a ban on textile flooring produced with components made of old tyres, with negative impact on all RTMs and markets.

How it should be

In future, this type of regulation should not be used to ban recycled materials / products, but rather to introduce rules and / or guidelines that illustrate the use of recycled materials in substitution of virgin resources, in order to strengthen those markets and guide them towards the goals of the Circular Economy.

The Challenges - 4

How it is

RTMs are used in a variety of products / applications but very little in the production of new tyres. Few companies, outside of Europe, use RTMs in the production of new tyres.

How it should be

The progress in R&D and the technology evolution should be adopted in Europe as well, and defined for the rubber industry targets in the use of RTMs.

The Challenges - 5

How it is

EPR, has been implemented by the creation of organisations, that collect the financial contribution from customers and manage it, while the work of collection, transport and treatment, are subcontracted to other companies (SMEs)

How it should be

The financial contribution should be managed by a public fund.

The Challenges - 6

How it is

More and more post-consumer tyres are exported in bulk for incineration, or moved across Europe from one side to another of the EU ignoring the proximity principle.

How it should be

The financial contribution should be fixed by national governments taking into account the proximity principle and the development of recycling capacity and markets – using Green Public Procurement as a stimulus.

The Challenges - 7

How it is

The creation of new products, the increase of the value of the output is limited to the efforts of tyre recyclers (SMEs) and research partners in the public and private sectors.

How it should be

10% of the financial contribution should be used to fund R&D projects and activities undertaken by the tyre recyclers and new industry partners.

Conclusion

The Circular Economy is an exciting and promising opportunity that needs a policy with clear regulations and incentives to be implemented effectively in tyre recycling as well as other sectors.

Thank you for your attention

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