EUROPEAN
TYRE & RUBBER
manufacturers'
association

Annual Report 2017

Moving innovation that cares

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ETRMA-European Tyre & Rubber Manufacturers' Association
Avenue des Arts 2, box 12
B-1210 Brussels
Tel. +32 2 218 49 40
info@etrma.org
Fotos: Fotolia.com
Design: inextremis.be mp5605

www.etrma.org

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Moving innovation that cares

European Road Safety Charter
Our commitment saves lives

"If I had to describe our industry in a few words, I would really say that it is guided not just by innovation, but by an innovation that cares - for the environment it works in, the people that it works for and to contribute to a sustainable future."

Christian Kötz

ETRMA President

The tyre and rubber industry is omnipresent in our everyday life. It is there every step of the way, moving our lives and our world and aiming at an ever-increased safety and sustainability in every sense of the word.

It is there from our first coffee of the morning, whenever we use any type of transport, when we speak with our mobile phones, use our computers, go to hospitals, take care of our children.

It is indeed a moving industry, constantly innovating and caring for the people that produce and use its products.

With 5% of its turnover invested in research and innovation, the industry is preparing for the changes that are re-shaping European mobility with a shift towards connected mobility and the sharing economy.

The European tyre industry - the most and the earliest regulated area in the automotive sector - is surely able and willing to accept any new mobility challenge in the mid- to long-term. However, the sector is very sensitive to solutions to the current issues “prior” to going forward.

These include, first and foremost, the need for effective enforcement and market surveillance of the existing regulations as well as the creation of a level playing field in Europe and internationally. This means ensuring that all players in the market are subject to and respect the same rules. However, the experience of the industry is that European production is strictly scrutinised around the world for compliance with local rules, whilst the EU is still to activate a continuous and effective market surveillance mechanism. For this reason, ETRMA was particularly pleased that Member States took up the initiative of conducting the first market surveillance authorities’ joint action on tyre label compliance, co-ordinated by PROSAFE.

Market uptake is another of such issues: whilst the industry has kept moving and developing, the choices of the market are still dictated by “old-fashioned” mechanisms and, especially, by price considerations. This is a great challenge and shows the need to demonstrating the value of these innovations, creating consumers acceptance and interest and finally better informing their choice. This is the joint responsibility of the industry and the legislative bodies and therefore a high priority of the work within ETRMA.

The skills needed to develop and produce such tyres have also changed and continue to do so by a further specialisation and by going through a process of hybridisation, in which mechanical, chemical, electronics, digital and soft skills are increasingly mixed and required. The kind of skills and tyres that will be needed in the future will also be greatly influenced by the growing servitisation of transport and by the automation of vehicles, as data will become a new and fundamental ingredient to deliver safe and sustainable mobility also through tyres.

The rubber industry needs to be helped through a better functioning internal market. This is especially true for elastomers in contact with drinking water, for which a real internal market is yet to come.

In a time of rapid changes, our industry has shown that it is able to strive by anticipating the challenges and by living up to them, adapting and always being part of the solution.

This work is facilitated also by the activities of ETRMA and I would like to thank all the members of the Association and its secretariat for their commitment and high level of ambition in upholding the interests of the industry.

One challenge for the industry remains that of reaching out to drivers to make sure that they understand and act upon the consequences of their behaviour vis-a-vis their tyres as this affects the safety of their vehicle and the environment."

Fazilet Cinaralp

ETRMA Secretary General

Our industry's efforts are geared into two directions: towards sustainability – the reduction of CO_2 emissions while improving tyre safety and preserving industry competitiveness – and towards connectivity.

The scope of the ETRMA's work has expanded over the years as have the competencies and areas of intervention of the European Institutions.

European Emission Trading System, Vehicle Type Approval and Market Surveillance, Low Emission Mobility, Decarbonisation of the Transport Sector, Drinking Water, REACH, Circular Economy, Digitalisation and Connectivity are only a few of the many regulatory files on which ETRMA has been working in the past eighteen months.

These are all important regulatory building blocks which will contribute to shape the tyre and rubber industry of today and tomorrow, influencing its societal and environmental footprint as well as its position and competitiveness in the world.

This work is based on and supported by economic, technical and scientific studies, which, together with academia and other industry and non-industry stakeholders, has been carried out to deepen the knowledge of our products and their effect on both health and environment. This activity will remain essential to empower our industry to contribute meaningfully to the legislative developments that are to come, as well as to anticipate the impact of future initiatives on the industry.

Another success factor of the Association has been its ability to work with its partners in Europe and world-wide. Exchanging best practices and co-operating to develop the best possible regulatory environment for consumers, drivers and industry is essential to support the efforts and investments made by the industry to constantly innovate and produce better and more performing products.

Finally, one challenge for the industry remains that of reaching out to drivers to make sure that they understand and act upon the consequences of their behaviour vis-a-vis their tyres as this affects the safety of their vehicle and the environment. To this end, ETRMA has developed and launched a pan-European campaign informing on how to best choose and maintain the tyres. A microsite has been created to store all this valuable material at **www.tyreaware.org**.

Last but not least, ETRMA owes its growing importance to its members whose contribution, information and involvement is at the heart of its very existence. To further facilitate this exchange, a new and revived member section has been launched, equipping the team and the members with a new and better tool to work together.

Achievements

1 Competitiveness and internal market

ETRMA is a key player in the automotive value chain. As such — and in coherence with the work of CARS21 — ETRMA has been called to contribute as an independent player in the GEAR 2030 High Level Group, launched by the European Commission in January 2016. The High-Level Group will provide a strategic assessment and recommendations to reinforce the competitiveness of the European automotive value chain.

Group photo of the Members of the High Level Group of the European Commission, lead by Elżbieta Bieńkowska, Commissioner for Internal Market, Industry, Entrepreneurship and SMEs.
Source: *@European Commission*

ETRMA is a founding member of the "European Sector Skills Council for the Automotive Industry" (EASC), funded by DG Employment. The Council published in February 2016 its Report, suggesting how to address and close the skills' gaps in the Automotive industry. These recommendations have been taken into consideration by the GEAR 2030 High-Level Group.

ETRMA participates in the ADCO (ADministrative COoperation) on Tyre Labelling. There, Member States are represented by respective Market Surveillance Authorities aiming at optimising the implementation and market surveillance of the Regulation on the labelling of tyres, thereby ensuring product compliance and a level playing field. Thanks to this work, the Market Surveillance Action on Tyres 2015 (MStyr15) was launched in April 2016 by PROSAFE and it will last until 2018. It coordinates the activities of 15 market surveillance authorities from the EU and Turkey and will look at ensuring that the tyres regulatory measures, with regard to safety and energy labelling requirements, are effectively enforced.

Progress was achieved in removing some of the barriers to trade built by important trading partners of the EU, such as Thailand and Tunisia. This was made possible by the close cooperation between the industry and the European Commission, which is always receptive to the needs of the industry and ready to act both multilaterally and bilaterally.

After more than ten years of work, **ETRMA is the closest it has ever been to achieving an internal market for elastomers in contact with drinking water.** The European rubber industry supported the Commission's ongoing work on the revision of the "Drinking Water Directive" with the objective of reaching an EU-harmonised legally binding positive list of substances allowed in the production of elastomer material in contact with drinking water, as well as EU-harmonised acceptance criteria and their related legally binding test methods for such products.

2 Tyre Aware

23 May 2016 marked the launch across Europe of the TyreAWARE campaign. This initiative aims to raise awareness of best practices and procedures on tyre maintenance, storage and service life for dealers, authorities and consumers. On the microsite www.tyreaware.org, tyre dealers and drivers can find advice on tyre storage, purchase, maintenance and service life in 14 languages. This is supplemented by useful videos explaining the correct time to replace tyres, the importance of monitoring correct inflation and when to fit winter tyres.

In the first year of use the site attracted more than 4000 visits from all EU Member States and beyond.

Check the website campaign here

3 Resource Efficiency

The European tyre industry is committed to continue improving its life cycle environmental performance:

- **In the production phase,** the industry has improved its energy efficiency by 20% since 2004 and is committed to further reduce its carbon footprint.
- **In the use phase**, the introduction of low rolling resistance technology – whilst maintaining or improving safety performances – will result in CO_2 savings ranging from 1.5 million tonnes to 4 million tonnes per year in 2020. This is equivalent to removing 0.5 million to 1.3 million passenger cars from EU roads every year.
- **Retreaded tyres:** tyre is a key contributor to the European circular economy. The practice of tyre retreading prolongs the life of truck tyres twice, reducing waste and limiting the use of raw materials and CO_2 emissions.

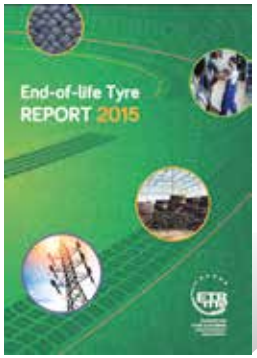
Compared to a low-end non-retreadable tyre,
a retreaded tyre enables saving...

- **70%** **Ressource extraction** (ore, oil...), mainly because of the avoided consumption of steel casings
- **29%** **Land use** or growing hevea
- **24%** **CO_2 emissions**
- **21%** **Air pollution** as measured by particulate matter emissions
- **19%** **Water consumption**

Source: *Ernst & Young report: The socio-economic impact of truck tyre retreading in Europe*

- **Environmentally and technically sound management of end-of-life tyres:** In 2015, about 3.87 million tonnes of used tyres were managed in an environmentally sound manner. This represents a 2.3% increase in arisings compared to 2014.

- **ETRMA published its End-of-Life Tyre (ELT) report in June 2016.** This report is complementary to the regular publication of data concerning ELTs. It provides a deeper analysis of treatment trends as well as the major challenges and opportunities of ELT management.



4 Sustainability

European Innovation Partnership (EIP) on Raw Materials: this European Commission initiative was key to bring about three important results for the European Tyre and Rubber Industry:

- The revision of the Critical Raw Material List through the new methodology is expected to lead to the recognition of Natural Rubber as a critical raw material and should be published soon. This is key for the rubber industry to receive proper political attention and consequent support.
- Endorsement by the European Commission of RUBB-ENDURE as a raw material commitment to support the devulcanisation of end-of-life tyres in an economic-sustainable manner to recover certain tyre ingredients.
- Endorsement by the European Commission of the EU-NARS-G "raw material commitment" focusing on the development of guayule or dandelion as viable alternatives to hevea rubber.

Under the leadership of ETRMA, an industry voluntary and collaborative activity was initiated.
The objective of this initiative is the securing of a global sustainable natural rubber economy, that delivers benefits across the whole of the natural rubber value chain. This initiative has been specifically requested and supported by the Industry Advisory Panel of the International Rubber Study Group.

ETRMA sponsored an independent epidemiological study on the risk of cancer of workers first employed after 1975 in the Rubber Manufacturing industry. This is the largest study of this kind ever carried out and two peer reviewed scientific papers have already been published in 2016 and 2017. A third paper is expected to be published soon.

ETRMA commissioned a literature review which was the basis for the publication in March 2017 of a new ISO technical report (ISO/TR/21275): *"Comprehensive review of composition and nature of process fumes in the rubber industry"*. This is an essential document as it provides a world-wide scientifically recognised reference.

May 2017 marked 10 years of REACH Regulation.
In these 10 years, the industry was able to take on the mammoth task of successfully implementing and ensuring compliance with this legislation, whilst ensuring that its competitiveness would not be hindered, but rather enhanced.

Competitiveness

The tyre and rubber industry is a stronghold of European manufacturing, directly employing over 360,000 people - and providing additional 800,000 indirect jobs - across the EU and contributing 0,5% of the EU GDP.

European industrial policy

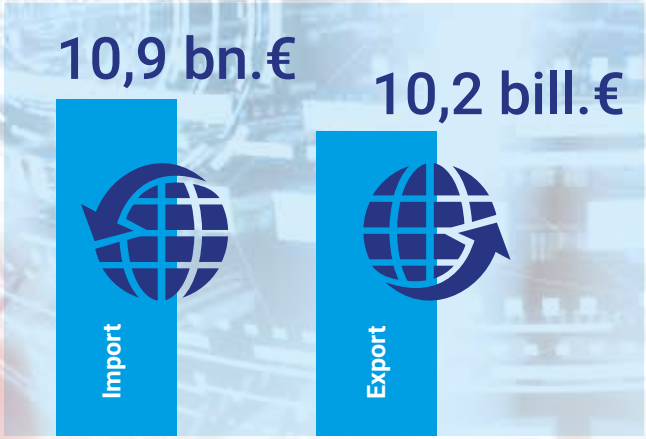
To maintain and increase this competitiveness and strong presence of the tyre and rubber industry in Europe, there is the need for an ambitious European industrial policy that delivers on the objective set by the European Commission when it took office: increasing the share of industry in the European GDP to 20% by 2020. To this end, ETRMA, together with 130 other sectors, signed a joint declaration asking the Commission to adopt an Action Plan to tackle the challenges that the industrial sectors are facing.

This would have to include concrete steps and milestones as well as a commitment to implement this Action Plan in a timely manner and regularly report on progress. For the tyre and rubber industry, the challenges are both on the global level – where the industry is often prevented from enjoying full access to growing third markets – and within the internal market – which, for rubber products in contact with drinking water, is still non-existent. For tyres, it is characterised by a lack of level playing field due to weak market surveillance.

Finally, another challenge is in the form of a shortage of skills for the industry of the future. This aspect also needs to be addressed in the context of a coherent and ambitious industrial policy.

Global competitiveness

ETRMA and China Rubber Industry Association (CRIA) met twice in 2016 to exchange best practices on tyre regulations. This dialogue is very important to ensure that Chinese efforts towards improving tyre performances will be in line with international standards.



Trade for tyre and rubber articles in 2016.
Source: *Eurostat*

In November 2016, the Secretary General of ETRMA travelled to India for the Automotive Tyre Manufacturers Association - Indian Tyre Technical Advisory Committee (ATMA-ITTAC) Golden Jubilee to exchange best practices with regard to tyre regulations.

Many non-EU countries, particularly emerging markets, have taken action to support local producers by adopting technical and/or other measures to limit imports. New barriers are constantly being raised and the old ones often remain unsolved.

ETRMA has been urging the European Commission to take a tougher stand, specifically in the negotiation and enforcement of Free Trade Agreements (FTA).

Because of such barriers, exports to some important markets have become either impossible or financially unviable. The European Commission has been over the years an invaluable ally of the European industry in trying to remove these barriers and, in 2016, it was successful in lifting some of them, for example in Thailand and Tunisia.

The European tyre industry is also heavily involved — through its technical arm, ETRTO[1] — in the negotiations of international technical standards in the framework of the UNECE 1958 Agreement. ETRMA has been working with the European Commission to promote these standards internationally and to expand the number of signatories of this Agreement. This process of harmonisation at international level is even more important as a growing number of countries is developing its own tyre standards. The Global Technical Regulation on Tyres is part of this global effort.

It is essential that regulatory competition is avoided and that the UN context brings closer together all the major market players, including, but not limited to, Brazil, Japan, Korea and, in the future, China. It is in this framework that the European tyre industry holds regular meetings with its counterparts around the world to enhance regulatory cooperation.

1 The European Tyre and Rim Technical Organisation

Enforcement and market surveillance

Tyres, like several other consumer products, are subject to European legislations with objectives regarding health and safety in the workplace, consumer protection, the environment and public safety as well as other public interests.

These legislations have the effect creating new responsibilities for manufacturers and new expectations on the side of customers and, in the case of tyres, on the side of drivers.

With the European tyre industry heavily investing in compliance and the consumers increasingly trusting the products that they acquire, there is the necessity to both secure these investments and protect the trust of the consumers, by making sure that all products in the market are compliant with these high standards.

Over the years, the tyre industry has collected evidence that not all products on the market respect relevant EU legislation. The presence of non-compliant products and economic operators in the market has the following consequences:

- The legislative objectives are diminished or not achieved at all;
- The confidence of consumers is jeopardised;
- The very fairness and efficiency of the internal market is at risk, as non-compliant operators are rewarded by becoming more competitive in terms of prices to the detriment of regulatory compliance.

In this context, ETRMA has been advocating for the need of increased, more coordinated, more visible enforcement actions through market surveillance. To do so, national authorities need a sound infrastructure, good organisation, appropriate legal powers, suitable facilities and skilled officers, benefiting from high quality training.

A significant step in this direction has been the launch of the Market Surveillance Action on Tyres 2015 (MStyr15). This campaign was launched in April 2016 by PROSAFE and it will last until 2018. It coordinates the activities of 15 EU market surveillance authorities from the EU and Turkey to ensure that tyre labelling requirements are effectively enforced. This is the first action of its kind and ETRMA believes it to be key to establishing a level playing field in Europe.

Market surveillance is also at the core of the revision of the Vehicle Type Approval Regulation, which is undergoing the final stages of its regulatory procedure. Although with significant differences in the level of ambition, all EU institutions support the plea of the industry for a harmonised surveillance regime and ETRMA looks forward to seeing this Regulation adopted and implemented successfully.

MSTyr15 has developed a training video and materials which provide specific details on how to conduct label and document inspections. It is available in 15 languages.

In August, half of the total intended 15,000 passenger car tyres were inspected.

PROSAFE estimates that the campaign will deliver energy savings of at least 105 GWh/year through removing incorrectly labelled passenger car tyres from the market.

Drinking water contact materials

100 years

Elastomers have been used in contact with the drinking water in many applications

General rubber goods are key for the functioning of several applications which consumers all around the world use every day.

Their use is of importance to guarantee sealing and water tightness at all temperatures and in extreme conditions. For this reason, elastomer materials have been in contact with drinking water and have been used in many applications for over 100 years.

These materials are highly sensitive because of their impact on public health. In the absence of a harmonised regulatory framework, several Member States have already taken action to regulate the substances within such products. Therefore, there is still no internal market for these materials.

ETRMA is actively working to solve this shortcoming and to offer consumers the same level of protection everywhere in Europe. This would also have the positive effect of reducing the costs related to the numerous certifications deriving from this lack of harmonisation.

In 2017, following a series of stakeholder consultations on its Roadmap on the Revision of the Drinking Water Directive, the European Commission is for the first time empowered to take a legislative step towards the adoption of an EU standard for this very important market. ETRMA is committed to make the most of this opportunity and to finally pave the way for a real internal market for these products!

Committed to sustainability

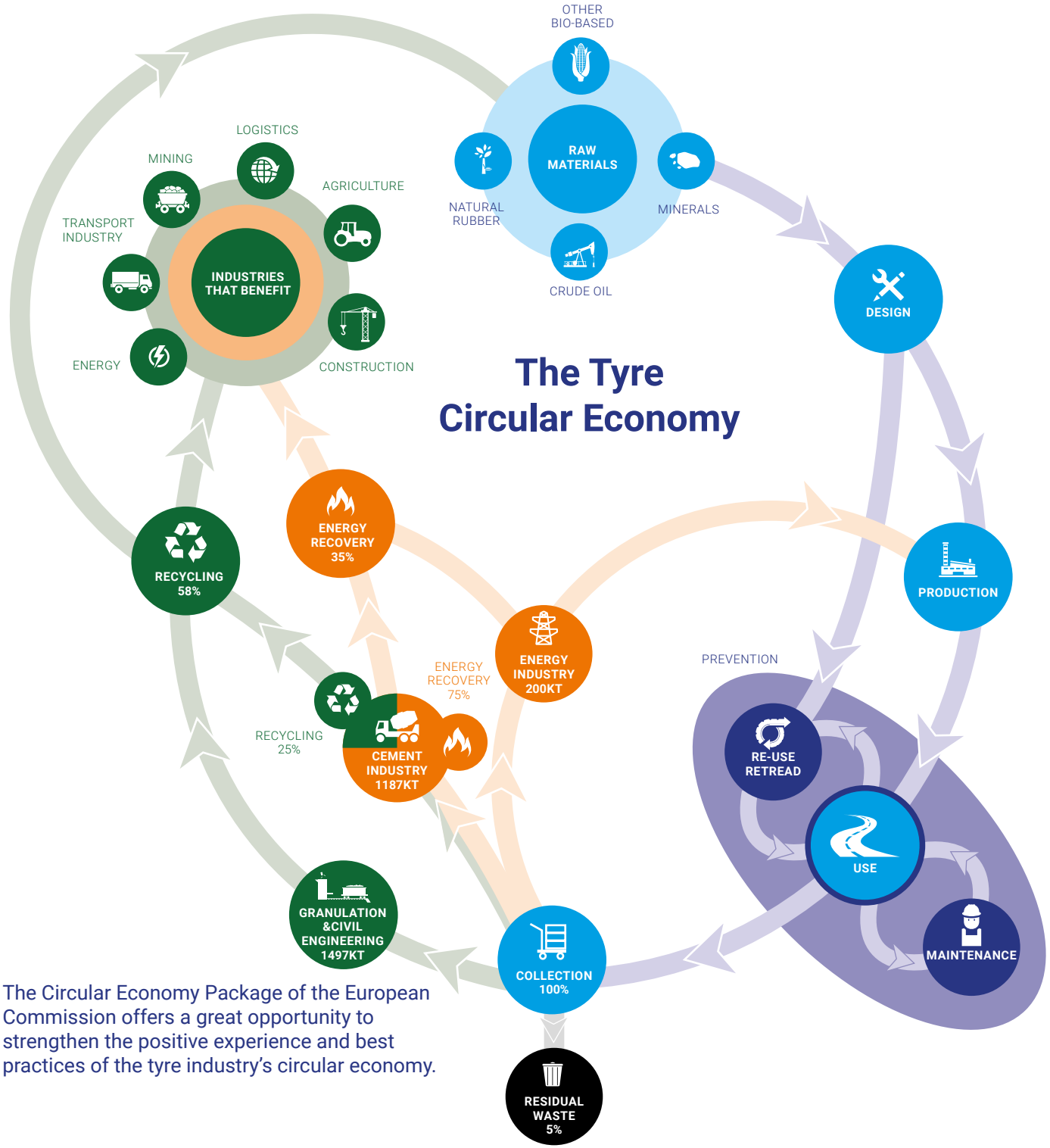
The tyre and rubber industry has significantly improved its sustainability at every stage, from design to end-of-life. Tyre weight reduction, voluntary commitment to phase out substances that proved to be dangerous, supporting the chemical industry in evaluating the risks connected to their products and the Sustainable Natural Rubber Initiative are some of the most recent examples of that commitment.

Tyre circular economy

The Circular Economy starts at the design stage, when raw materials are considered to manufacture tyres that are sustainable throughout their life cycle, taking into account the possibility of their re-use and recyclability at the end of their life.

During the use phase, tyres need to be well-maintained and technology is helping by ensuring the correct tyre pressure, loading and reminding about wheel position rotations. This has positive effects both by extending the lifespan of a tyre and by allowing the consumer to enjoy the full benefit of improved tyre technologies. Furthermore, truck tyres are commonly designed to be retreaded and have up to three lives.

Once tyres reach their end-of-life, these are collected and managed in the most environmentally and technically sound manner. Secondary raw materials from end-of-life tyres (ELTs) are a resource for other industries such as construction, automotive, etc.



The Circular Economy Package of the European Commission offers a great opportunity to strengthen the positive experience and best practices of the tyre industry's circular economy.

Sustainable natural rubber sourcing

Natural rubber is mainly used in tyre production. More than one million ton of natural rubber is used in the EU, every year. This represents about 10% of the world production and about 76% of this is used to produce tyres. The main producing countries are in South East Asia, particularly in Indonesia, Malaysia, Thailand and Vietnam.

Sustainable and responsible sourcing depends on the diversification of sourcing and on ensuring transparency and compliance of the whole natural rubber value chain with the principles of sustainability, corporate social responsibility and resource efficiency.

The European tyre and rubber industry has been investing in the expansion of the cultivation of natural rubber in regions beyond South East Asia. In 2015 experts from the rubber sector have participated in the EU-African Union Session on Raw Materials to raise awareness of both EU and African authorities on the natural rubber opportunities that lie still untapped in many African countries.

Research is ongoing to find alternatives to the hevea tree and to build an EU-sourced natural rubber supply chain that could be economically, socially and environmentally sustainable in the long run. Since its launch in 2013, ETRMA has been an active contributor of the European Innovation Partnership on Raw Materials, which has the objective of enhancing innovation, competitiveness and lessening its dependence on imports from third countries.

80%

of the world natural rubber is produced in South East Asia

Source: *IRSG*

Finally, at the specific request and with the support of the Industry Advisory Panel of the International Rubber Study Group (IRSG), an industry voluntary and collaborative activity was initiated with the objective of securing a global sustainable natural rubber economy that delivers benefits across the entire natural rubber value chain.

International Rubber Study Group

Two IRSG meetings took place in 2016 with a focus on natural rubber sustainability. The first one, on 29 February 2016 in Brussels, and the second in May in Singapore, involving civil society organisations and the rubber sector value chain.

The Emission Trading Scheme

Another building block of the sustainability of the tyre life cycle concerns the production process and, in particular, emissions of CO_2 from the manufacturing process, which were reduced by 20% in the last decade.

The reform of the EU Emission Trading Scheme (ETS) is at the cornerstone of the EU Climate Policy and has extensive consequences on the ability of the European industry to compete with third country actors that are not subject to the same requirements, hence leading to a risk of carbon leakage.

The ETS results in direct and indirect costs which only apply to local manufacturers, which puts the EU industry at a competitive disadvantage compared to its international competitors which are not subject to any similar initiative. This increases the already very high pressure from tyre imports which have become a growing presence on the European tyre market. The trend has also been exacerbated by the still recent economic crisis, which further shifted consumers' choices towards price rather than quality and performance.

This is a difficult balancing act, which the EU institutions have taken on during the legislative process, now in its final stages. During this work, ETRMA has proven a strong and reliable partner, not just by identifying the matters that would hamper the competitiveness of the industry, but also by proposing solutions, cooperating with well-established independent organisations, industry stakeholders and institutional partners at all levels.

Management of materials and substances

May 2017 marked the 10th anniversary of Europe's regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) Regulation and ETRMA, representing an industry that is a major downstream user of chemicals, has been successful in implementing and anticipating emerging risks and regulatory steps that could be hindering its competitiveness.

Looking back, the industry working together with the European Chemicals Agency (ECHA), the European Commission and EU governments, has taken on a mammoth task of registering 14,000 substances and by working on evaluation, authorisation and restriction procedures. This has been particularly challenging for the rubber goods industry, which is mainly made of SMEs.

In this work, the European tyre and rubber industry has been active as a downstream user in helping the chemical industry to develop exposure scenarios and

When it comes to the REACH review process, the industry greatly values the stability of rules that are clearly understood, uniformly applied and effectively enforced across the EU.

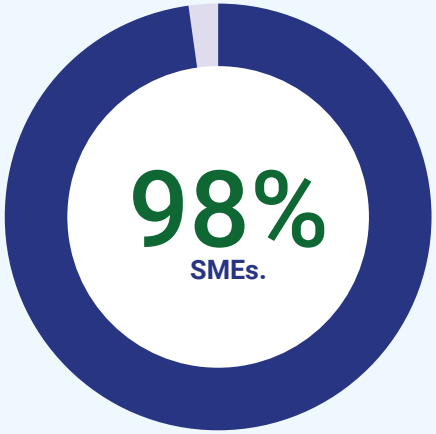
European General Rubber Goods Manufacturers

more than

4000

companies

of which



Source: *ETRMA*

in emphasising the need for science-driven, evidence-based policy making.

Looking forward, the industry's efforts will be geared towards supporting the 2018 REACH review process. In this context, the rubber industry would be best supported by refraining from great amendments to the Regulation as the industry greatly values the stability of rules that are clearly understood, uniformly applied and effectively enforced across the EU. This last point is fundamental to protect the competitiveness of the industry as ETRMA has found evidence in the past[2] that not all players in the market – and especially importers – respected the rules. Enforcement and market surveillance need to be supported at all levels both from a political and a financial point of view and be aligned throughout the EU.

Looking more in detail, ETRMA asks to consider the following points:

- Authorisation should only focus on substances that represent a real concern;
- Workplace legislation should be fully recognised as a Risk Management Option (RMO) by REACH authorities;
- The overlap between the Classification, Labelling and Packaging of chemical substances and REACH might be a source of confusion as the two pieces of legislation are not 100% harmonised.

Workplace legislation is another pillar of ETRMA's activities to ensure proper management and handling of substances. One of the most important pieces of work in this sense concerns the Directive "Protection of Workers from the Risks related to Carcinogens and Mutagens", which is currently being amended.

The industry has been at the initiative of a substantial number of independent studies considering the important changes in occupational hygiene, leading to the elimination of exposure to known carcinogens.

Epidemiological studies reviewed by the Independent International Prevention Research Institute (IPRI), launched in 2014, were concluded at the end of 2016. Their main findings were published in two scientific peer-reviewed articles[3]. The study looks at the health outcomes of over 38,000 workers employed since 1975 in the rubber manufacturing industry and concluded that "*no consistent increased risk of cancer death was observed among rubber workers first employed since 1975, no overall analysis of the pooled cohort produced significantly increased risk*"[3]. This confirms the positive impact of the investments made by the industry since the 50's and the 60's to deal with the carcinogens identified and eliminated since then. Furthermore, it is an encouragement for the industry to continue on this path.

In January 2017, the Scientific Committee on Occupational Exposure Limits (SCOEL) of the European Commission confirmed that further research and consultations were required to come up with specific occupation exposure limits on individual substances possibly generated during rubber processing.

2 ETRMA carried out two surveys in 2010 and 2011 showing that 10% of imported tyres were non-compliant with PAHs in oils restriction.
3 Boniol, M. and Koechlin, A. and Światkowska, B. and Sorahan, T. and Wellmann, J. and Taeger, et al. (2016) Cancer mortality in cohorts of workers in the European rubber manufacturing industry first employed since 1975. Annals of Oncology, 27 (5). pp. 933-941. ISSN 0923-7534; - Boniol M, Koechlin A, Sorahan T, et al Cancer incidence in cohorts of workers in the rubber manufacturing industry first employed since 1975 in the UK and Sweden Occup Environ Med 2017;74:417-421.

Sustainable mobility

Mobility has a great influence on how European citizens live their lives and its transformation will contribute to shaping the society of tomorrow. Decarbonisation, electrification, connectivity and servitisation of transport are some of the key trends characterising the commitment and investments of the road transport industry. These focus areas have a deep impact also on the tyre sector and guide its work and investments.

The implications of these trends on the transport sector were recognised by the European Commission in the 'Europe on the Move' set of initiatives that was published on 31 May 2017. A second package is awaited in the fall of 2017.

Decarbonisation:

Tyres are an important enabler of sustainable mobility as they are the only point of contact between the vehicle and the road. This is no larger than the surface of a postcard for a passenger car and of an A4 sheet of paper for truck and buses. Mainly because of their rolling resistance, tyres account for up to 20% (when they are properly inflated and maintained) of the fuel consumption of passenger cars and 30% for truck and bus.

Considering the Communication on Low Emission Mobility published in July 2016, the industry focused its attention on freight mobility and committed to reducing the heavy-duty vehicles' tyre rolling resistance coefficient by 1% per annum on average. In practice, this would translate into in a reduction of 8.7 million tons of CO_2 due to tyres, which corresponds to removing 81.000 40 ton - trucks from European Roads, every year.

This will add to the progress already made by tyres for both passenger cars, trucks and buses since 2012 when minimum requirements regarding fuel consumption (low rolling resistance) - balanced with safety (wet grip) and external rolling noise - were implemented.

The decarbonisation of road transport cannot only rest on the progress of tyre technology.
A lot more can be achieved by ensuring that all stakeholders, including the drivers and fleet managers, play their part.

The following additional measures need to be supported:

Tyre Pressure Monitoring System (TPMS):

This system ensures that tyre pressure is optimal thereby maximising the benefit of low rolling resistance tyres to the vehicle's CO_2 emissions reduction and lowering fuel consumption.

- Regulation 661/2009 requests that all new passenger cars sold after November 2014 are equipped with TPMS, with a Stage II still pending implementation. This further step needs to be completed to fully benefit from improved fuel efficiency – as well as safety – performances.
- Such mandatory equipment with TPMS is urgently needed for trucks and buses, for which TPMS is not yet compulsory.

These requests have been expressed several times by ETRMA and the importance of TPMS was recognised in a study on road transport carried out by TNO[4] and published in 2016.

Retreaded tyres:

This refers to the replacement of the worn-out tread with a new one.

Europe has been for a long time a centre of excellence in retread technology, products and operations. Retreading is of a very high economic importance for the commercial vehicle tyre sector and the competitiveness of the broader EU transport sector. Retreaded tyres have provided a safe, low-cost and environmentally sustainable business solution for the EU transport sector for many years. Moreover, it is a perfect match for the EU objectives and polices to implement "circular economy" and resource efficiency.

- A truck tyre designed for retreading can be retreaded up to two times. The lifespan of a tyre produced in Europe can be therefore estimated at about 660,000 km.
- This practice contributes greatly to the European circular economy both by reducing waste (160 kg for each tyre that is retreaded twice), by saving raw materials (104 kg for each tyre retreaded twice) and by decreasing the production of new tyres, thereby achieving savings in terms of CO_2.
- Retreading is carried out mostly by SMEs which employ, along the value chain, 32,000 people across the EU.
- Historically, new tyres were more expensive than retreaded tyres. This is no longer the case due to a flooding of low-cost, single-life tyres from China. It is estimated that these tyres can only run for 120,000 km. Because of their short life, their cost per km is higher than that of new medium and heavy commercial vehicles tyres that can be retreaded and have up to three lives.

As a result, the small retreaders face now extreme difficulties and this positive business model is under serious threat by cheap single life alternatives.

4 TNO: Sven Jansen, Antoine Schmeitz, Sander Maas, Carmen Rodarius: Study on some safety-related aspects of tyre use, 22 December 2016 - https://ec.europa.eu/transport/road_safety/sites/roadsafety/files/pdf/vehicles/study_tyres_2014.pdf

The lifetime

of a retreaded tyre compared to an imported tyre

Low-end imported tyre

120,000 km

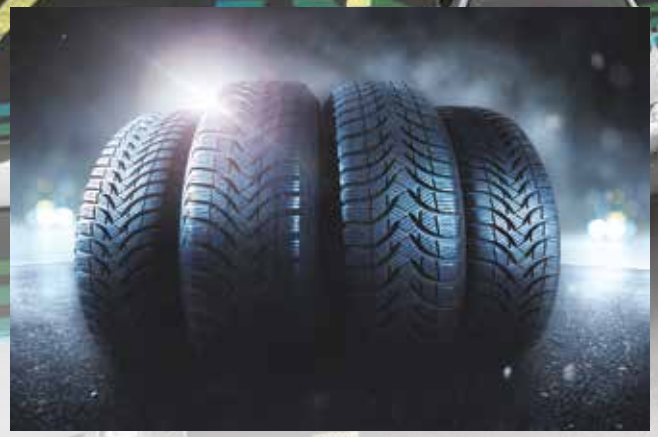
Retreaded tyre

220,000 km

A retreaded tyre can present the same performance as a new high-end type.
A premium tyre designed for retreading can be retreaded up to two times.
The lifespan of a tyre produced in Europe can be estimated at about **660,000 km.**

Source: *Ernst & Young report: The socio-economic impact of truck tyre retreading in Europe*
N.B. The figures presented herein are the result of a review by EY of information published by the tyre industry as well as European and Asian tyre distributors.

“Smart tyres” for smart mobility



The European tyre industry regards connected and automated mobility as a way to foster innovation and growth, while contributing to the enhancement of the social impacts of transport. These include technologies for a safer and greener journey and the development of products and services more tailored to the consumers’ needs.

It is essential that an appropriate regulatory framework will accompany the development of such technologies. For tyres, this will mean the shift, over time, of tyre maintenance responsibility from the driver to the vehicle.

Tyre data will become crucial to ensure a safe drive, low emission mobility and improved service to the customer. ETRMA contributed in 2017 to the discussion on the “European Data Economy”, as part of the Digital Single Market strategy on the following specific issues:

- Tyre identification, tyre generated data and vehicle data relevant to mobility should be made available to tyre manufacturers. This is essential to deliver mobility safety and improved services and tyre innovation;
- Fair/transparent choice and informed (after) market access for the consumers: tyres are changed several times during the life of a vehicle. It is important that connectivity and automation in vehicle development will not reduce the consumers’ ability to choose replacement components of the vehicles (inter alia tyres) by suggesting a unique commercial service to the consumer;
- Unrestricted competition between tyre suppliers on the replacement market: this can be achieved both by leaving it up to the consumer to choose which “tyre data” they wish to receive. Furthermore, there is the need to forbid the sharing of such data between competitors as this would have an adverse effect on competition amongst brands,
- The security of the data against hacking or misuse is key and should be guaranteed by the vehicle manufacturers.

Tyres have always been essential to the performance of the vehicle and data from and for ”smart tyres“ will be another element that will allow such performance to further improve.

Tyre and road wear emissions

Traffic related sources have been recognised as a significant contributor to the ambient PM (particulate matter) concentrations particularly in urban environments and major cities.

There are two main categories of these particles: exhaust vehicle emissions and non-exhaust traffic related emissions. The latter include particles that are formed from wear of vehicle components such as brakes, clutches, chassis and tyres but are likewise generated from road surface wear. They are also made of particles which already exist in the environment as deposited material which become re-suspended due to traffic induced turbulence.

Anticipating the development of regulatory requirements in terms of air quality, the tyre industry established in January 2006 the Tire Industry Project (TIP[5]), under the umbrella of the World Business Council for Sustainable Development (WBCSD), to identify and address the potential health and environmental impacts of materials associated with tyre making and use. One major focus of the TIP research is developing a better understanding of Tyre and Road Wear Particles (TRWP) generated during normal tyre use and wear.

From measurements of airborne particulate matter, carried out during this work, it has been concluded that TRWP are too heavy to stay airborne and will be transported to roadside run-off[6]. Furthermore, less than 1% of the total TRWP generated remains airborne (particles below 10 mg)[7]. Therefore, it was concluded that due to their density it can be assumed that TRWP are sedimentary and consequently are unlikely to reach the ocean.

Acute[8] and chronic[9] ecotoxicity studies of the potential adverse effects of TRWP on aquatic organisms in freshwater sediments have also been conducted. The results, together with previous studies demonstrating no acute toxicity of TRWP, indicate that under typical exposure conditions TRWP in sediments pose a low risk of toxicity to aquatic organisms in freshwater.

The most recent and proactive work done by ETRMA in this respect concerned the investigation of the fate and possible effects of TRWP in the water environment. This research aims at resolving the current discrepancies between the very different figures circulating on the quantification and distribution in the environment of such particles. This new study — started in March 2017 — is based on a novel approach which takes into consideration data already collected on the size and density of these particles and further looks at whether and how these are transferred to the aquatic environment. The study is supported by an independent scientific advisory board — which has validated its approach and protocol — and should be completed before the end of 2017.

Its results will also feed into the European Commission's own investigation on microplastics[10], which is expected to be completed at the end of 2017.

5 This project is chaired by the three largest tyre manufacturers – Bridgestone (Japan), Goodyear (US) and Michelin (France) – and includes a total of eleven companies representing approximately 70% of the world's tire manufacturing capacity
6 J. Panko et al. 2013. Measurement of airborne concentrations of tire and road wear particles in urban and rural areas of France, Japan, and the United States.
7 "Particles above 10 µm (referred as dust in this report) represent at least 99% of the mass of the particles emitted, leaving less than 1% mass for particles below 10 µm (PM10). They are sedimentary in nature and will deposit primarily on the road or near the road. These particles have the potential to be transported to the aquatic environment through road run-off discharges. It has been assumed that particles below 10 µm are dispersed and float in the air, while dust sets down for 33% into soil and 67% into water (Blok 2005 and ChemRisk 2009)."
8 Marwood C., B.L. McAtee, M.L. Kreider, R.S. Ogle, B.L. Finley, L.I. Sweet, and J.M. Panko. 2011. Acute aquatic toxicity of tire and road wear particles to alga, daphnid and fish. Ecotoxicol. 20(8):2079-89 -http://www.ncbi.nlm.nih.gov/pubmed/21789673
9 Panko, J.M., M.L. Kreider, B.L. McAtee, and C. Marwood. 2012. Chronic toxicity of tire and road wear particles to water and sediment - dwelling organisms. Ecotoxicology. 2011 Nov; 20(8):2079-89. doi: 10.1007/s10646-011-0750x http://www.ncbi.nlm.nih.gov/pubmed/23001428
10 Investigating options for reducing releases in the aquatic environment of micro-plastics emitted by (but not intentionally added in) products.

End of Life Tyre management

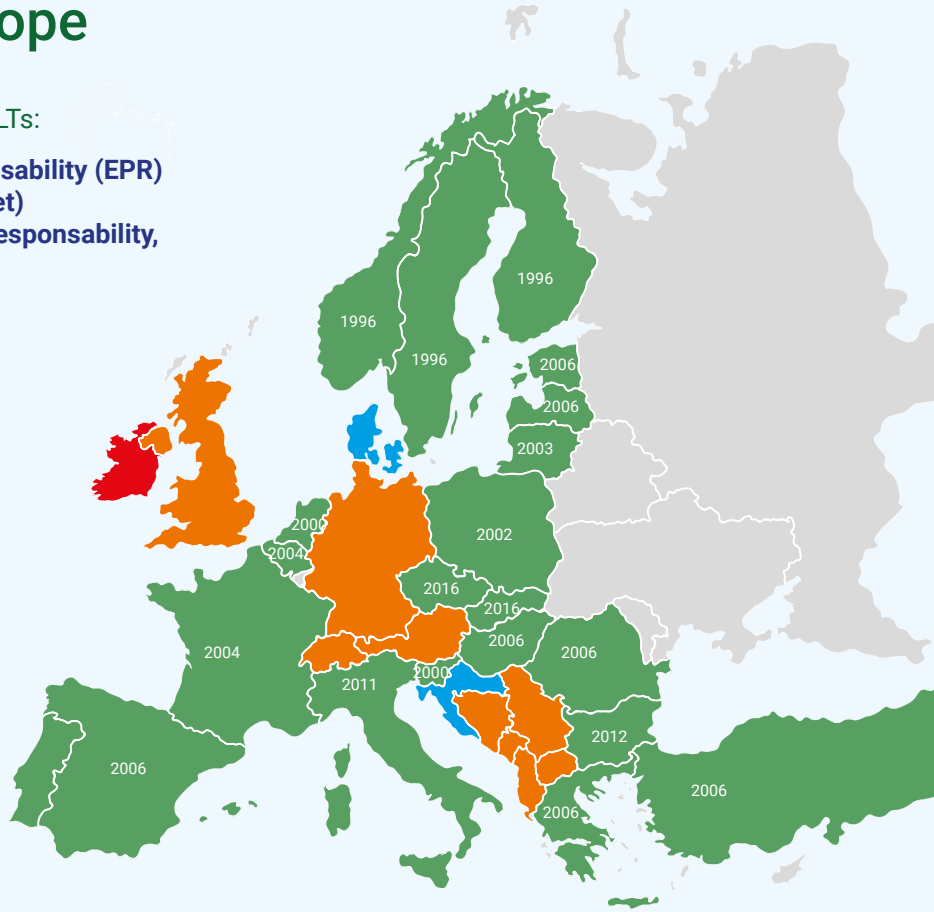
Responsibility in managing end-of-life tyres (ELT) is a core activity of the tyre industry as much as all other phases of the design and production process. In the EU three different systems exist for managing end-of-life tyres.

- With the establishment of the new Czech and Slovak ELT management companies, in 2016 there were 15 ELT management organizations set up at the initiative of tyre manufacturers working throughout Europe under the producer responsibility principle and 21 countries with an extended producer responsibility (EPR) regulation for tyres representing about 66% of European used tyres arisings. In these countries, the manufacturer is responsible for the environmentally sound disposal of the waste resulting from the product;

ELT management schemes in Europe

Today within the EU there are 3 different models for managing ELTs:

- **1- Extended Producer Responsability (EPR)**
- **2- Liberal system (Free market)**
- **3- Tax system (Government responsability, financed through a tax)**
- **4- Law under revision**



The numbers in the countries are they year of the local producer responsibility law

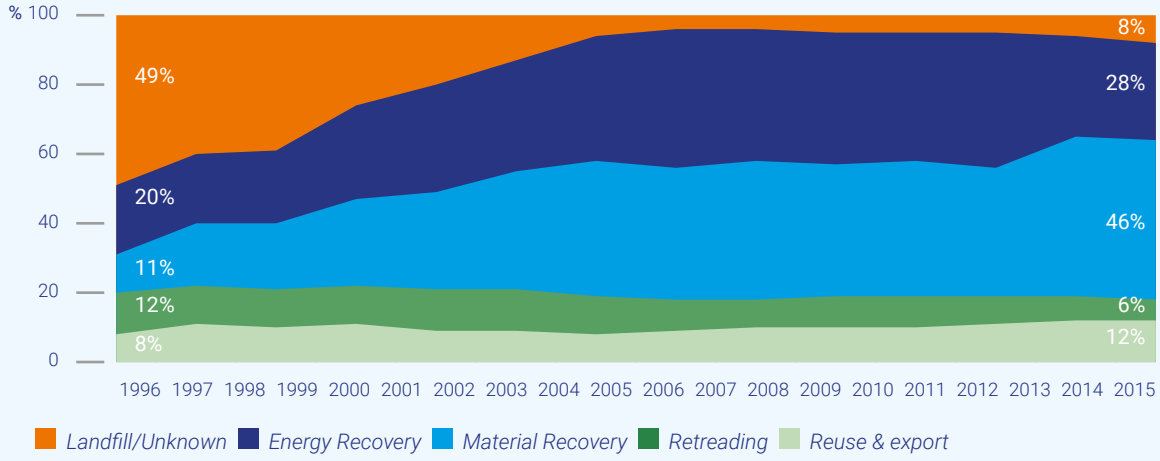
- 9 countries have a free market scheme. The legislation sets objectives to be met but does not designate those responsible;

- 2 countries apply a tax system, which funds the management of end-of-life-tyres (ELT).

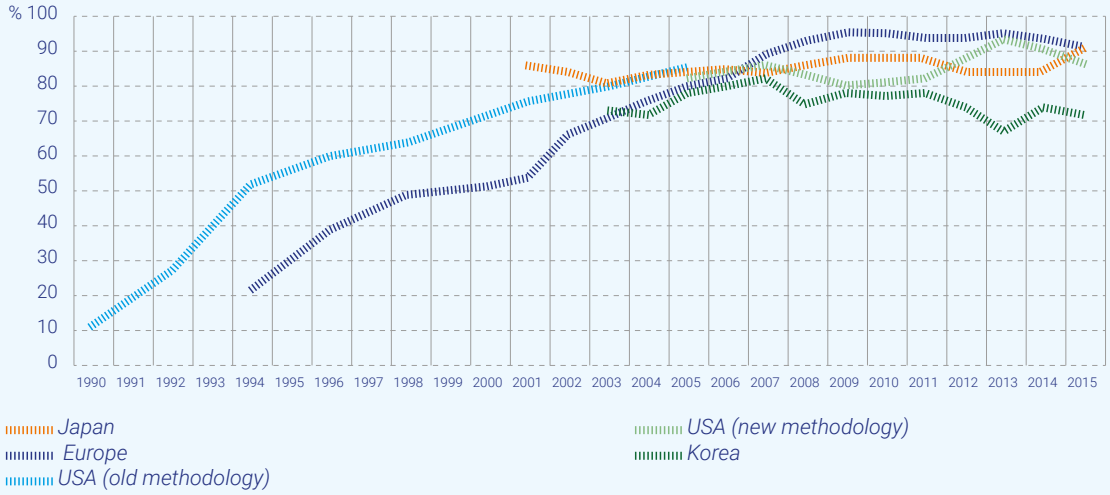
In 2015, the management of used tyres in Europe maintained a high recovery rate of 92%. This means that more than 9 tyres out of 10 arising as used tyre in EU28, Norway, Switzerland and Turkey were reused, recycled or sent to energy recovery.
The flow of this material towards recycling grew in 2015 (+1.44%) and was used in a number of applications, public works and civil engineering as well as in cement kilns, which operate a hybrid process contributing to both recycling and energy recovery of ELTs.

Globally, recovery rates for ELTs have increased significantly, but Europe remains one of the most advanced regions in the world in terms of treating ELTs.

EU Treatment Routes for Used Tyres (1996-2015)



International data on ELTs recovery rates in % of ELT arisings



Crumb Rubber

Crumb rubber is one of the secondary raw materials that can be derived from end-of-life tyres (ELTs). This material is used in many applications, from children playgrounds, to sport surfaces, from moulded objects to road applications (asphalt rubber).

The success of the tyre circular economy is strongly depending on the ability of tyre recyclers to access these markets and it is based on a robust confidence in the ability of these materials to substitute new ones in all their performances. The European tyre manufacturers, although they are not engaged in the production of crumb rubber, are socially responsible actors in the rubber industry and care about the effects on society of using crumb rubber in any application. Therefore, ETRMA together with stakeholders in the value chain, including ELT management companies, tyre recyclers and artificial turf field installers, launched a research programme assessing the risk for users resulting from exposure to rubber infill material used in sport surfaces. This extensive and independent study will last for two years and is conducted with a research consortium[11], led by FoBIG (Forschungs- und Beratungsinstitut Gefahrstoffe GmbH).

Furthermore, in order to promote better quality and an increased market uptake of these secondary raw materials, ETRMA participates in the work of CEN TC366 to validate CEN TS14243 into an EN standard. The objectives of this work include developing standards related to certain physical and composition characteristics of the materials produced from ELTs. These new standards will also determine general properties of whole tyres as required for further processing. The publication of this standard is foreseen mid-2019.

11 The consortium includes the following organisations: FoBIG (DE), Labosport International (FR), Eurofins GfA GmbH (DE), Eurofins Product Testing A/S (DK)

Rubberised Asphalt

Rubberised asphalt is another promising market for ELT-derived secondary raw materials. It refers to regular asphalt that has been modified with ELT-derived rubber powder. Advantages are the following mechanical benefits:

- **high durability of pavement** with lifetimes up to three times longer compared to traditional asphalt;
- significant **containment of maintenance interventions and costs**;
- excellent **drainage in wet weather**, with a **strong improvement in visibility**;
- excellent response in case of **sudden braking**
- **important environmental value** as a resource derived from recycling of end-of-life tyres.

Further significant benefits are related to the reduction of noise from road transport, which is estimated between 3dB and 5dB.

Both the EU, through the **Vehicle Noise Regulation** (EU) No 540/2014) and the **Tyre Labelling Regulation** (EU) No 1222/2009), and local administrations give great importance to the reduction of noise from traffic.

However, despite the wish expressed by the EU to invest in research assessing the impact of road surfaces on the level of noise, no further project has been initiated.

ETRMA has been working with other stakeholders, including the European Commission, to promote rubberised asphalt. Furthermore, ETRMA contributed to the revision of the EU GPP criteria for road construction to ensure that rubberised asphalt technologies could be an eligible choice.

ETRMA will continue to develop ways to remove the hurdles that stand in the way of better promoting this kind of application.

Rail transport boosting ELT potentials

The rail and tramway sector offers a huge potential for the use of ELT-derived secondary raw materials. Throughout the world there are many projects looking at the advantages of using recycled rubber in rail and tramway construction.

The ELT-derived raw materials have potential uses in many sectors, from sub-ballast — the underlying layer of ballast that forms the bed upon which the trackbed is laid — through coated ballast that helps reduce impact and noise, to the rail ties or "sleepers" that the rails are bedded into.
In tramways the use of rubber to mount the rails reduces noise and vibration, making trams more acceptable in the modern city.

A case in point is the use of ELT-derived rubber by STIB, the "Société des Transports Intercommunaux de Bruxelles" since 1998, first as recycled rubber filler blocks (97% recycled rubber) placed on both sides of the tramway rail leading to 3dB noise attenuation, then since 2000 as "sleepers" (made of 97% recycled rubber) placed on both sides & below the rail with vibration attenuation performances up to -5dB. Another innovation to further reduce vibration came with the use since 2003 by STIB of vibration damping mats (made of 95% recycled rubber), that are placed horizontally in the rail casing (with a vertical edge). This solution helps reducing vibrations up to -20dB.

Another promising development is the Green Rail project, which looks at the creation of sleepers, which are moulded from a blend of recycled rubber granulate and recycled plastics. For every km line equipped with these sleepers, 35 tonnes each of tyres and plastics would be used, according to the manufacturers of such rails.

ELT-derived rubber can also be used in pedestrian areas to provide shock absorbing surfaces, and in components for the vehicles used on the transport system.

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