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ALLIANZ ZUKUNFT REIFEN

GREEN DEAL

GREEN PAPER

NO GREEN DEAL WITHOUT RECYCLING

A VISION CAN BECOME REALITY

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VISION

Recycle and reuse
100% of tires

MISSION

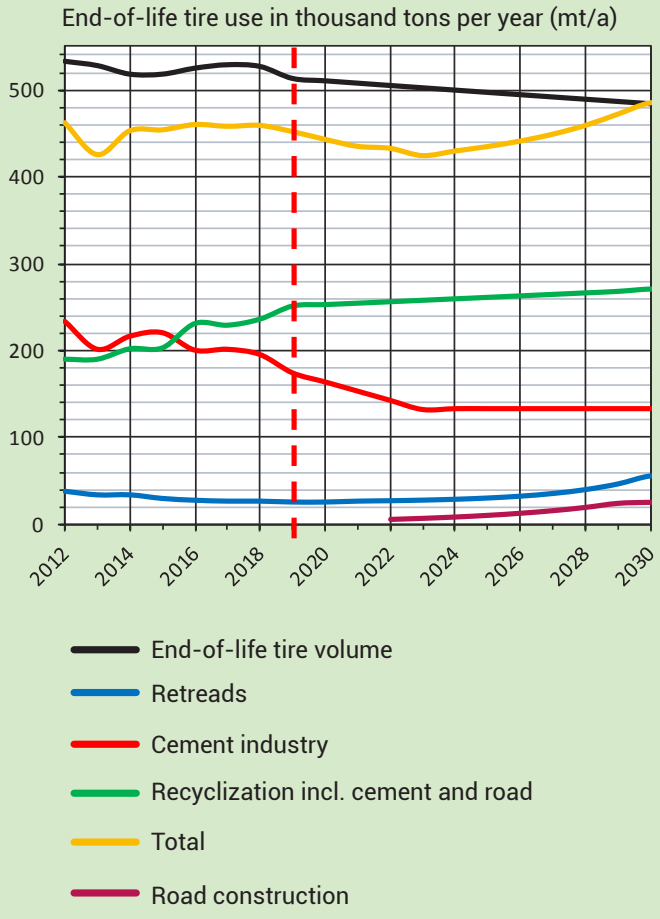
Sustainable Circular Economy
across industries

More and more end-of-life tires are being reused and recycled:

598,000 metric tons of end-of-life tires recycled in Germany in 2021:

MATERIAL RECYCLING	**220,000 T** (40.89 %)
THERMIC UTILIZATION (INCINERATION)	**166,000 T** (30.85 %)
PROF. TIRE-RETREADING	**85,000 T** (15.79 %)
EXPORT FOR REUSE & RECYCLING	**59,000 T** (10.96 %)
CHEMICAL RECOVERY	**8,000 T** (1.48 %)

Forecast for the development of end-of-life tire recycling by 2030:



The proportion of thermally utilized tires (cement industry) is expected to decrease by 2030. In contrast, retreading and material recycling will increase significantly.

Source: Feasibility study Chemnitz University of Technology 2020

(as of August 2022, source: foreign trade statistics (Genesis), VdZ, surveys wdk/BRV)

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TIME TO ACT: PAVING THE WAY FOR A SUSTAINABLE CIRCULAR ECONOMY

There is only one planet Earth. Yet by 2050, the world's resource consumption is set to reach a level as if we had three of them. Worldwide biomass, fossil fuel, metals, and minerals use is projected to double within thirty years. By 2050, the annual waste output will likely increase by as much as 70%.

> *„The most decisive decade in human history to date lies ahead of us. For it is the decade in which we must bring all our lives back into harmony with the stress limits of the planet."* *(Prof. Dr. Johan Rockström, 2021)*

Scaling up the Circular Economy industry-wide, from pioneers to established economic operators, will be vital in achieving the 2050 carbon neutrality target, de-coupling economic growth from resource use while securing long-term economic viability for EU enterprises while leaving no one behind.

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THE TIRE RECYCLING INDUSTRY IS ONE OF EUROPE'S SUSTAINABILITY PIONEERS

Each year, around **3.5 million tons of end-of-life tires** accumulate in **Europe**. When more of these tires are retreaded, materially, or chemically processed, it is better for humankind, the climate, and the environment. The aim is to **reuse or recycle 100 percent** of used tires to avoid waste, reduce CO2 emissions, conserve natural resources, and protect the environment.

The sustainable Circular Economy of tires covers everything from the sustainable production of new tires and the certified collection of used tires to the (multiple) retreading of tires and the **environmentally compatible** material and chemical recovery of the raw materials contained in used tires to create **high-quality recycling products with a wide range of applications**. **This is how the material cycle is closed sustainably.**

The EU must **manage to iron out the conflicts of goals between the Circular Economy and the chemicals legislation to meet the sustainability goals of the Green Deal** and develop a uniform, cross-industry, and transnational strategy. In addition, the use of retreaded tires and sustainable recycled products (among other things, from used tires) has to be promoted throughout the EU - this is the only way we can work together to achieve the ambitious goals of the Green Deal. **Failure to do so threatens the end of the Green Deal!**

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GROWING SIGNIFICANCE OF RECYCLING DUE TO RISING TIRE DEMAND WORLDWIDE

Tires are an essential component for the mobility of the Economy and society. Demand for tires worldwide has increased consistently over the past few years. In 2019, approximately 1.26 billion passenger car tires (original and replacement tires) were sold around the globe. That same year, around 164.7 million truck tires were sold. In 2021, the total had already increased to about 1.5 billion tires for vehicles of all types (source: Statista).

„You will soon be able to drive everywhere, except that it will no longer be worthwhile to get there."
(Konrad Lorenz)

Statistically speaking, every German citizen consumes one tire per year. Globally, according to a survey by the Gallup International Association (GIA), consumption is about 1.75 billion end-of-life tires, which equates to a mass of around **30 million tons**. About 3,300 tires reach the end of their lives every minute but are unfortunately not recycled or reused in every region. The result is a growing **environmental problem**.

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GRAPH: END-OF-LIFE TIRE RECYCLING IN GERMANY 2021

(as of: August 2022, Source: Foreign trade statistics (Genesis), VdZ, surveys wdk/BRV)

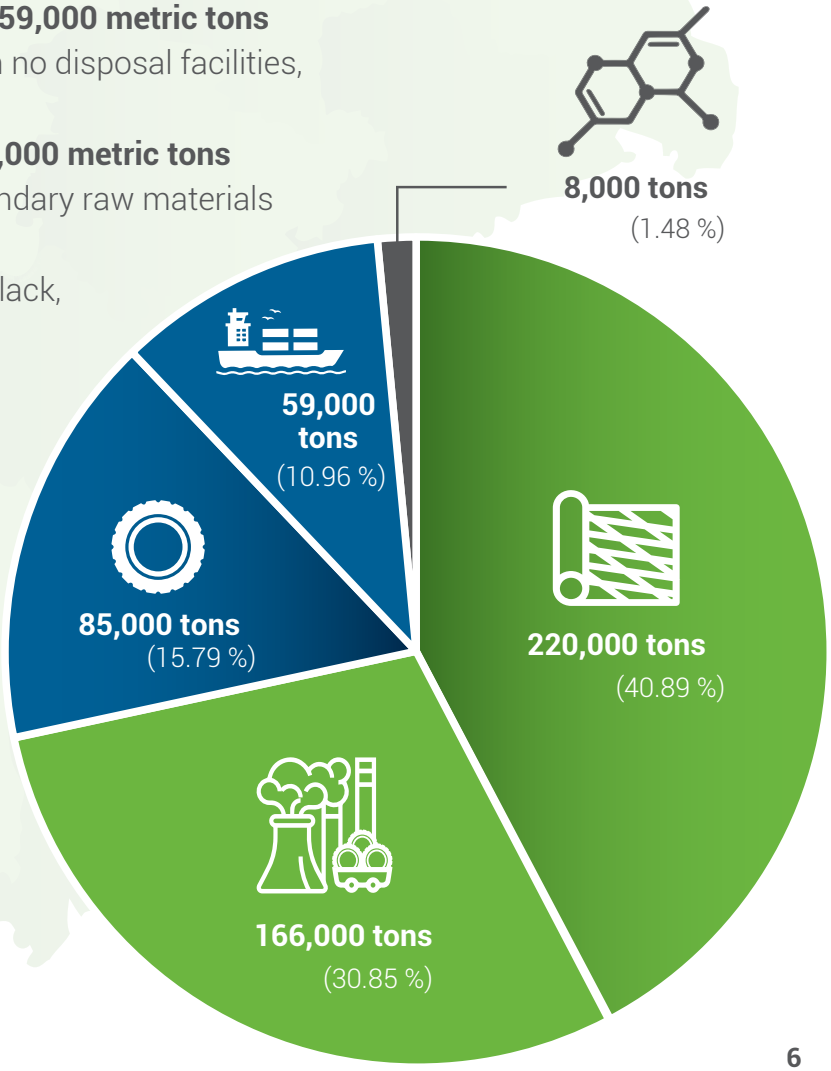
Material recycling into rubber granulate/rubber compound: 220,000 metric tons
- Durable, robust recycled material with low CO2 emissions
- High quality products from rubber granulate/rubber compound

Thermal utilization: 166,000 metric tons
- Sustainable fuel substitute (esp. cement industry)
- High calorific value, low sulfur content

Carcasses for retreading: 85,000 metric tons
- Multiply tire mileage
- Save over 60 % raw materials & CO2 emissions

Exports for reuse and recycling: 59,000 metric tons
- Exports into countries with no disposal facilities, should not be allowed

Chemical recovery (pyrolysis): 8,000 metric tons
- Recovery of valuable secondary raw materials (e.g. for new tires)
- Rubber granules, carbon black, Thermolysis oil



End-of-life tires for reuse and recycling in Germany 2021:

538,000 metric tons

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> *„Achieving CO2 neutrality by 2035 is extremely challenging, but still quite possible if politics and society are acting in the same direction."*
>
> *(Manfred Fischedick, Wuppertal Institute for Climate, Environment, Energy, October 2020)*

In order to achieve a sustainable Circular Economy for tires EU-wide as a model for other industries, it is essential to act now. The following framework conditions must be adjusted immediately:

- All new tires must be electronically readable via an **identification system** (RFID chip). The insights gained from data collection will optimize the entire tire recycling process long-term.

- Only **certified disposal companies** are authorized to collect all tires and pre-sort them according to their intended use. This creates the basis for the efficient, eco-friendly reuse and recycling of end-of-life tires. The ZARE initiative is a model for successful implementation.

- Any tire carcasses rated suitable for retreading after thorough inspection by certified experts must be considered commercial commodities and classified as a recyclable material (end of classification as waste).

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1. Drastically Increase the Rate of Retreads

Brand-name tire retreads for commercial and passenger vehicles have been confirmed to have the same quality, safety, and durability as comparable new tires. They also provide many ecological and economic advantages.

> *„Tire retreading is a promising, future-oriented concept that not only works out from an economic standpoint but also ecologically and socially."*
>
> *(Christina Guth, AZuR Network Coordinator, February 2023)*

The production of retreaded tires saves over 60 percent of CO2 emissions and raw materials and around 50 percent in energy (electricity and gas) compared to new tires. Brand-name retreads reach the same mileage as new tires and are up to 30 percent lower in cost. The following measures must be implemented throughout the EU to ensure that in the future, used tires are retreaded to the maximum extent possible:

- **All new tires approved in the EU for passenger cars and commercial vehicles must be retreadable.**
- Government agencies prioritize the use of retreaded tires on all vehicle classes. Legislation must define a quota for this purpose. The use of retreaded tires in public tenders should not be excluded.
- Fleet operators will benefit from an additional government subsidy for retreaded tires.

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2. Expansion of Eco-Friendly, Material-Based Tire Processing

Rubber granules (ELT) recycled from end-of-life tires in an eco-friendly process provide valuable secondary raw materials for a broad range of environmentally **sustainable, long-lasting products**. They range from weather-resistant, elastic flooring for playgrounds and sports fields to structural protection mats for green roofs and photovoltaic systems to rubber-modified noise-insulating asphalt. About **700 kg of CO2 emissions can be saved** for every ton of recycled and not incinerated end-of-life tires.

Today, around 40 percent of end-of-life tires in Germany are recycled, which is **expected to reach up to 75 percent in the future**. To achieve this quota across the EU by 2030, the following measures must be implemented immediately:

- 90 percent of tires unsuitable for retreading will have to be **processed environmentally friendly** and recycled into sustainable granulated rubber and rubber powder.
- End-of-life tires currently undergoing thermal utilization (especially in the cement industry) require transfer to material recycling and recovery as soon as possible.
- Recycled rubber granulate contains firmly bound PAHs, and their migration cannot be determined in realistic conditions. Within the framework of the EU Commission's review of current PAH limits, **hazard-related, migration- and emission-based measurement methods must be implemented** at the EU level to avoid jeopardizing the particularly environmentally sustainable recycling of tires. stoffliche Verwertung von Reifen nicht zu gefährden.

initiative-new-life.de

„The best waste is the waste that is not created in the first place."

(Stephan Rau, Technical Managing Director wdk, January 2023)

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3. More Roads Covered With Rubber-Modified Asphalt

Road construction binding agents have increasingly used virgin polymers to modify asphalt for over twenty years. Ground rubber made from recycled end-of-life tires lends itself exceptionally well to modifying bitumen for road construction and asphalt, according to the E GmBA. Adding five to ten percent recycled ground rubber into the binder enhances the quality of roads in a variety of ways:

- Admixed rubber compound prevents the formation of ruts and cracks in the pavement, minimizing maintenance and extending its service life significantly.
  Over the long term, rubber-modified asphalt offers more **economic benefits than regular asphalt**.

- Rubber-modified asphalt facilitates the production of open-pore asphalt mixtures, making them ideal for **reducing road noise**.

- Rubberized asphalt cuts hazardous vapors/aerosols during processing and can quickly provide recyclable material for new asphalt pavements.

- To promote the use of rubber-modified asphalt EU-wide, it must be made available for public tenders - this will require appropriate legal regulations and standardization
  The market share of rubber-modified asphalt mixtures in EU road construction projects is estimated at one percent - an increase is urgently needed. In the United States, conventional asphalts are only permitted to a limited extent.

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4. Volumen der Devulkanisation von Altreifen-Gummi erhöhen

Tires are made of vulcanized rubber, making them more durable and elastic. Vulcanization is a relatively recent recycling process for end-of-life tires, which involves splitting the natural rubber into vulcanized rubber in a heated process. Devulcanization methods provide the option of processing waste tire rubber as a secondary raw material in other products, as is the case with material recycling, **without sacrificing the quality of the raw material, which can then be reused as feedstocks** in the manufacture of tires, for example.

- Optimizing technology via R&D to convince tire manufacturers and retreading companies of the benefits of using TDPs.
- Enhancing sorting of end-of-life tires EU-wide to ensure maximum feedstock homoge neity for devulcanization.
- Expand the volume of devulcanization EU-wide and establish more facilities in Europe.

„Transitioning to climate neutrality will bring significant opportunities, such as the potential for economic growth, new business models and markets, new jobs, and technological development."

(European Council Conclusions, December 12, 2019)

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5. Optimizing Chemical Recycling of End-Of-Life Tires (Pyrolysis)

Initially, pyrolysis involves shredding waste tires in several stages to form rubber granules, grinding them to a fine grain, feeding them to the homogeneously heated pyrolysis reactor, and vaporizing it into their components. The gaseous products generated during tire pyrolysis flows through a heat exchanger. Pyrolyzed carbon black can be used for the production of new tires. After condensation in the heat exchanger, the pyrolysis gases are collected as pyrolysis oil and, after filtration, used as fuel. After filtration/desulfurization, the non-condensable components of these gases can be utilized for power production in conventional gas engines. EU-wide promotion of pyrolysis requires the following steps:

- **Ecological and economic optimization** of the pyrolysis process.
- Development of new, efficient uses for pyrolysis reactor feedstock gas and coke, such as hydrogen extraction from pyrolysis gas.
- **Quality improvement of pyrolysis outputs.**

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JEOPARDIZING THE FUTURE OF RECYCLING END-OF-LIFE TIRES DUE TO EU LEGISLATION

Creating a sustainable Tire Circular Economy as a model for other industries is threatened in several ways by legislation at the EU level. By potentially affecting 100 percent of the tire recycling market, this legislation jeopardizes the implementation of the Green Deal targets. It has direct consequences for the climate, the environment, the Economy, and jobs.

THREATS POSED BY EU BANS/ STRICTER LAWS

THREAT 1

The European Commission's planned stricter method of measuring the PAH content in so-called end-user products jeopardizes the use of environmentally friendly recycled products made of rubber granulate, even though it has been proven that they do not pose any risks.

THREAT 2

The proposed revision of the REACH regulation by the EU Commission jeopardizes the use of almost all environmentally friendly recycled products made from rubber granulation and rubber powder.

THREAT 3

Ban on sustainable granular infill for artificial turf, which, when appropriately used, is harmless to people and the environment due to the debate on prohibitions.

„Going forward, products that are the cleanest and most beneficial to society should be the products that have the greatest advantage in the marketplace."

(Annalena Baerbock, The Greens, April 2021)

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WHAT HAPPENS IF NOTHING HAPPENS?

Fast action is needed at all EU levels to achieve the ambitious sustainability goals of the Green Deal. Failure to work together in Europe and set the course for a sustainable circular economy by 2030 will have severe environmental and economic consequences:

> *Without immediate and large-scale emission reductions in all sectors, global warming can no longer be limited to 1.5°C."*
>
> *(World Climate Report, April 2022)*

NEGATIVE IMPACTS OF INACTION

IMPACT 1

Increased CO2 emissions are emitted into the atmosphere - approximately 700 kg per ton of end-of-life tires recycled non-environmentally responsibly.

IMPACT 2

The exploitation of natural resources and dependence on imported raw materials are rising.

IMPACT 3

Enormous waste mountains (some illegal) emerge, growing by around 13.5 million tons of end-of-life tires.

IMPACT 4

Entire industries, with tens of thousands of jobs, are on the verge of being eliminated.

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ADVANTAGES OF SUSTAINABLE, CIRCULAR TIRE RECYCLING

ENVIRONMENT

CONSUMER / MANUFACTURER AND LEGISLATOR SECURITY

ENCOURAGING THE CIRCULAR ECONOMY

PROTECTION OF NATURAL RESOURCES

CUTTING CO2 EMISSIONS

AVOIDING MILLI-ONS OF TONS OF WASTE

ENERGY SAVING (ELECTRICITY AND GAS)

ECONOMY

SECURING FUTURE INVESTMENTS

REDUCING DEPENDENCE ON RAW MATERIAL IMPORTS

PRESERVING VALUE CREATION IN THE EU

CREATION OF NEW LOCAL JOBS

INCREASE IN P RODUCTION CAPACITIES

SECURING REGIONAL LOCATIONS

EXPANSION INTO NEW PRODUCTS

RELIEF FOR ADMINISTRATION TASKS

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SHARED COMMITMENT TO THE GREEN DEAL

New opportunities will arise for the entire continent if politics, commerce, and society unite and agree to act in unison for the Green Deal by 2030. The critical factor in this is positively influencing legislation at the EU level in the interests of a sustainable circular economy. Merely introducing a Europe-wide migration measurement of the PAH content of recycled products would have positive effects in several ways:

> *„Ask not what your planet can do for you.*
> *Ask what you can do for your planet"*
> *(freely adapted from John F. Kennedy)*