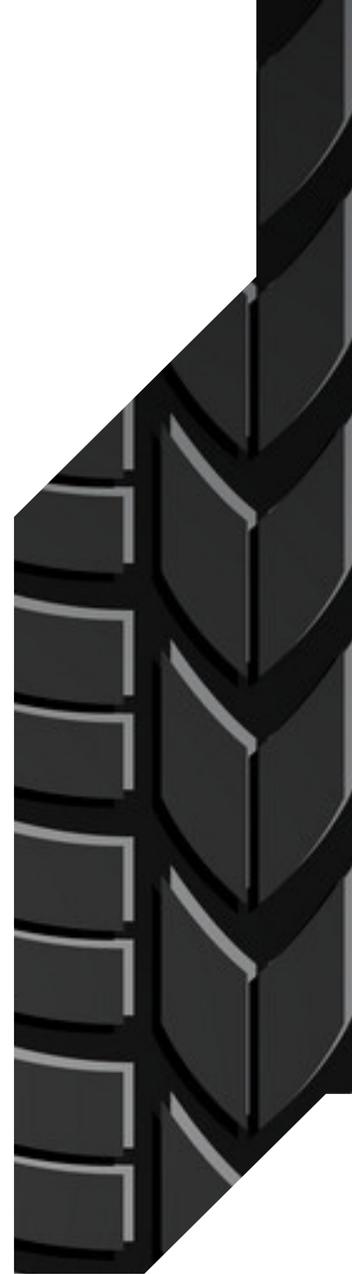


AN UNEXPECTED ELECTRIC VEHICLE ENVIRONMENTAL PROBLEM WITH COMMON SENSE SOLUTIONS



Prepared by

RECYCLED



RUBBER COALITION

Electric vehicle growth

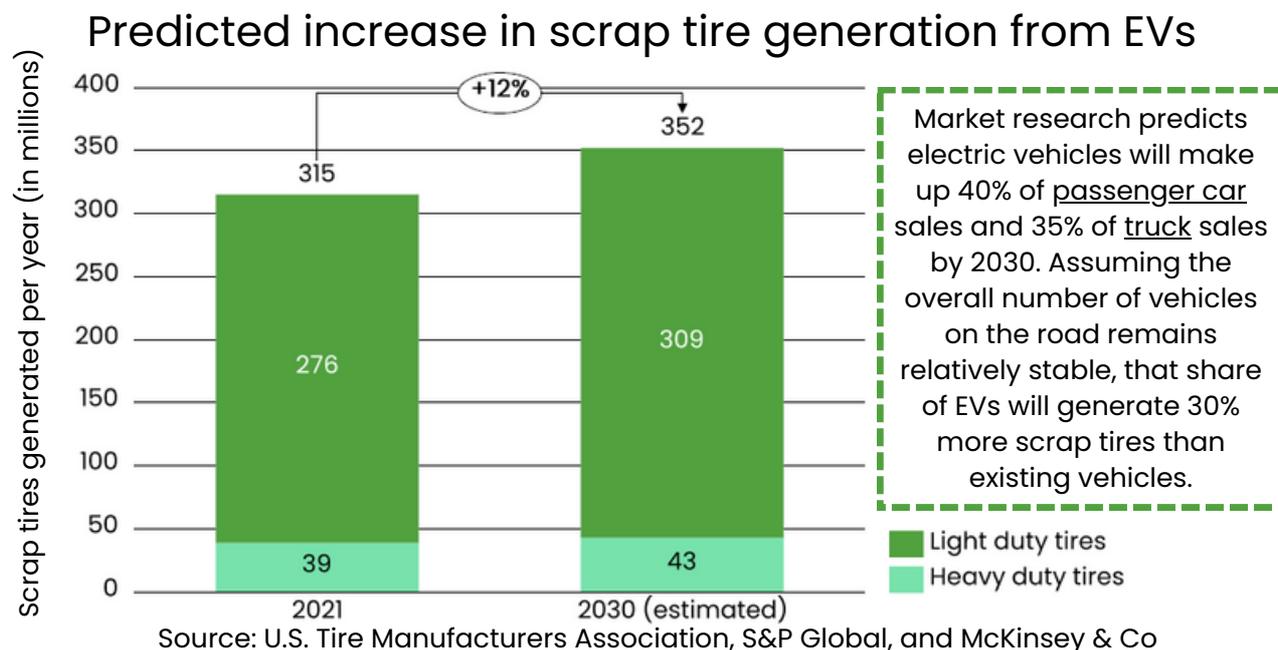
The United States is witnessing a rapid adoption of electric vehicles (EVs)—in 2023, annual sales of EVs surpassed one million for the first time ever, a 54% increase from 2022. At present, the transportation sector accounts for about 30% of total U.S. greenhouse emissions, and the growing adoption of EVs has the potential to drastically reduce total emissions.

An unexpected environmental problem

Despite all the benefits EVs confer on the environment, they actually increase one environmental challenge: the cars produce more scrap tires. EVs have batteries that are heavier than a traditional combustion engine and are, on the whole, 20% heavier than an equivalent gas-powered vehicle.

Additionally, electric vehicles can also reach maximum torque almost instantaneously, which increases the car's acceleration rates while also increasing the friction, contributing to increased tire wear and waste.

Heavier vehicles use tires up to 30% faster. At present, the United States produces approximately 315 million scrap tires per year. With the adoption of EVs, we expect that number to increase 12%, to 352 million scrap tires annually by 2030.



A concerted effort

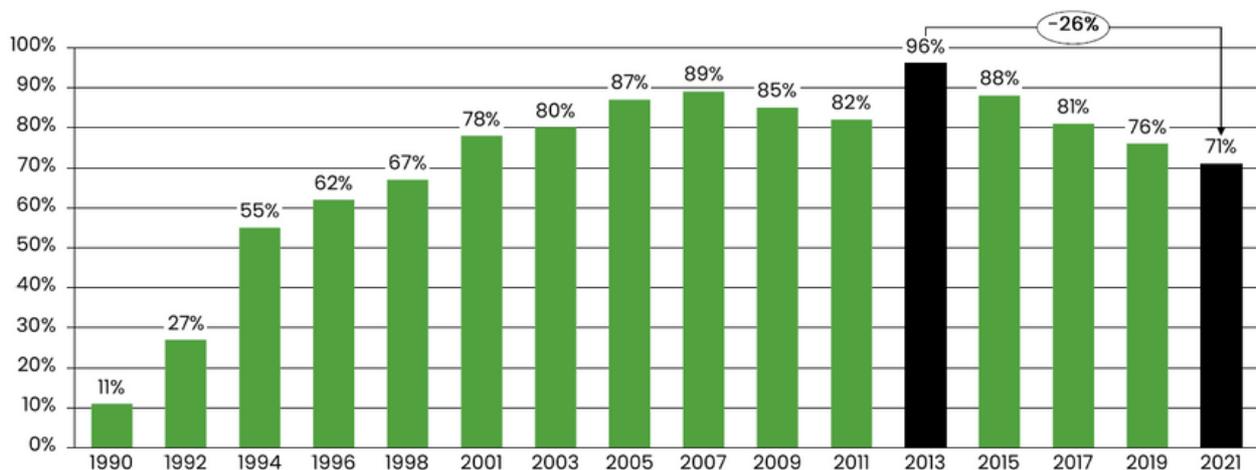
A major benefit to tires is that they are designed to be long-lasting and durable. While their durability is critical to keeping vehicle owners safe, it also means that tires are difficult to dispose of responsibly at the end of their lifespan.

As recently as the 1990s, the majority of end-of-life tires (ELTs) were dumped into landfills or illegally discarded into the natural environment. Without proper disposal, scrap tires can become breeding grounds for mosquitos and the diseases they carry. Additionally, unsecured tires can be a fire hazard. At one point, the U.S. had over 1 billion ELTs stockpiled around the country.

Due to the environmental and public health consequences of stockpiled tires, the U.S. federal government, state governments, and private industry, began a concerted effort to clean up these stockpiles, an effort that was met with great success. By 2021, the U.S. had decreased its stockpile by over 95% with 50 million tires remaining stockpiled.

This effort was the genesis of the rubber recycling industry that we know today. Rubber products, like tires, are ideal candidates for recycling because of their durability, and the industry has developed innovative end-use markets.

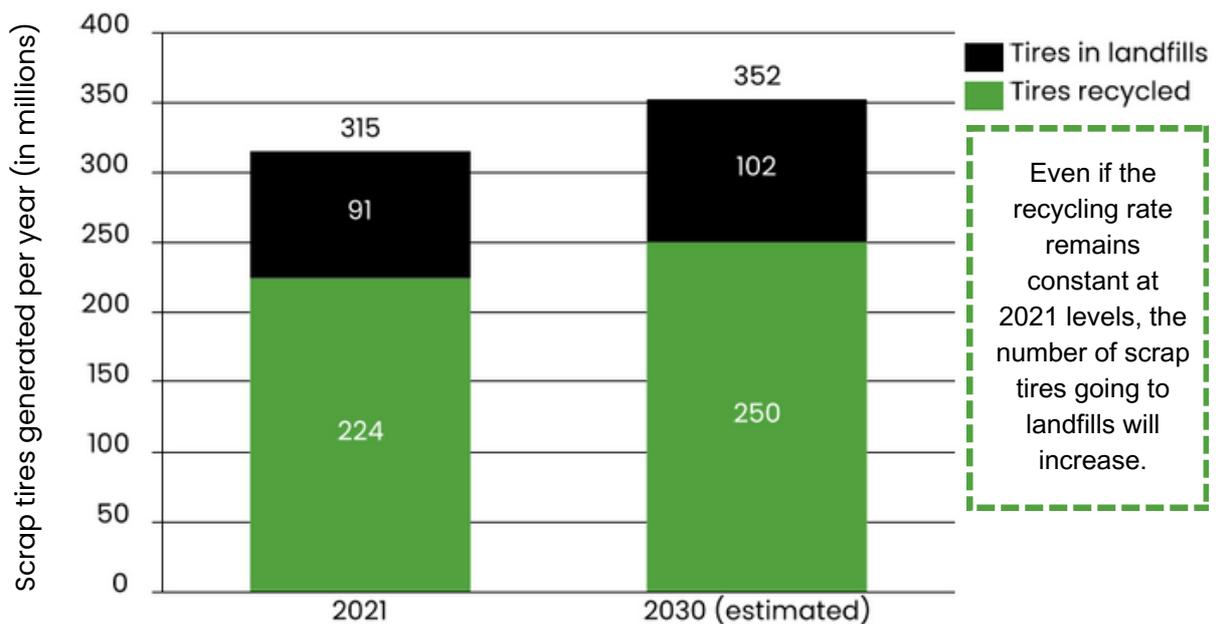
U.S. tire recycling secondary use rate



Source: U.S. Tire Manufacturers Association, European Tyre & Rubber Manufacturers Association

While we currently have the technology to put scrap tires towards reuse, tire production over the past few years has outpaced the potential markets for recycled rubber. As a result, the rate of reuse has been on a steady decline, dropping from 96% in 2013 to 71% in 2021.

Predicted increase in landfilled scrap tires



Source: U.S. Tire Manufacturers Association, S&P Global, and McKinsey & Co

The increase in scrap tires generated by electric vehicles will only compound this problem if we do not invest in expanded market uses for recycled rubber. With an estimated increase of 37 million tires from electric vehicles by 2030, we will need to make a concerted effort to increase the recycling and reuse of scrap tires.

Common sense solutions

The good news is that many proven methods already exist to capture, reuse, and recycle tires. Additional investment in research and development into scrap tire uses is needed to keep pace with the ever-expanding volume of scrap tires, but there are many commercially viable applications available today to increase the re-use of scrap tires.

For example, rubber-modified asphalt (RMA) uses crumb rubber in the construction of new roads. Compared to regular asphalt, RMA dramatically increases the lifespans of roads and reduces costs by 43% due to the materials' increased resistance to cracking and rutting. RMA creates smoother pavements, which leads to better ride quality for drivers and a significant reduction in tire wear. Moreover, the use of RMA produces 32% less CO2 emissions than regular asphalt. 8,000 scrap tires per mile!

Across the board, the use of recycled rubber for RMA is a win-win-win; for the budgets of state transportation departments, motorists, and the environment. Yet the current market for RMA uses only 3% of the total scrap tires generated in the U.S. annually. A two-inch-thick RMA resurfacing project uses about 2,000 scrap tires per lane mile; that means that a project on a four-lane highway uses 8,000 scrap tires per mile! With an estimated 8.7 million miles of road lanes across the U.S. and recent federal investment in infrastructure, there is ample opportunity to put scrap tires to use and expand the use of RMA.



Tire-derived aggregate from recycled scrap tires can help reduce vibration and noise from trains.

Image source: Valley Transportation Authority

Recycled rubber can also be used to produce tire-derived aggregate (TDA), a product that can be used in civil engineering projects. TDA offers an environmentally friendly alternative to traditional construction materials used for lightweight fill, road construction, and embankment stabilization. TDA can reduce vibration and noise from trains when placed beneath and in between the tracks, a method that has been used by California's BART and L.A. Metro systems.

The material is also more affordable than traditional methods of noise reduction which saves transportation agencies—and by extension, taxpayers—money. For example, San Jose used 1,000 tons of TDA in a light rail expansion project, saving over \$1 million.

Recycled rubber can be used for molded goods and innovative flooring. For example, recycled rubber has been used in healthcare facilities and nursing homes because it is comfortable and quiet for medical professionals and patients. 485k tons of crumb rubber are currently used in rubber molding and rubber flooring applications, but a conservative estimate of the existing potential market could be four times the current size.

This is in addition to widely known and popular uses, such as the use of recycled rubber mulch or poured-in-place surfaces for playgrounds.



Recycled rubber can also be used as poured-in-place surfacing for playgrounds. These rubberized surfaces can protect against falls from heights of up to 12-16 feet and make playgrounds more inclusive for kids with disabilities.

Image source: Northern California Recreation

Call to action

There are state and federal policy solutions that can help us solve the emerging problem of increased tire waste from the increased adoption of electric vehicles.

At the state level, we can ensure that all 50 states have fees on the purchase of new tires, which are critical for reducing illegal tire dumping and encouraging higher-end uses for recycled rubber.

At the federal level, the U.S. EPA and Department of Energy should prioritize grants for expanding uses of recycled rubber—similar to existing programs for plastics recycling. Significant strides have recently been made by the federal government in incentivizing states to consider low-carbon materials, like RMA, offering substantial environmental advantages and potential cost savings for taxpayers. Given the huge potential benefits for the environment and taxpayers' dollars, this is an area where we hope to see future public investments.

Prioritizing policy that supports market expansion is a necessary step to help the industry achieve higher levels of reuse and recycling—even in the face of a growing number of scrap tires.

As we make worthwhile investments in transitioning to electric vehicles, let us make sure that by solving one environmental problem (carbon emissions), we do not create another one (scrap tire waste)

Innovation and common sense support for recycled rubber uses can ensure that electric vehicles net out positively for the environment.

Follow us on social media:



@Recycled_Rubber



RecycledRubberCoalition



Recycled Rubber Coalition