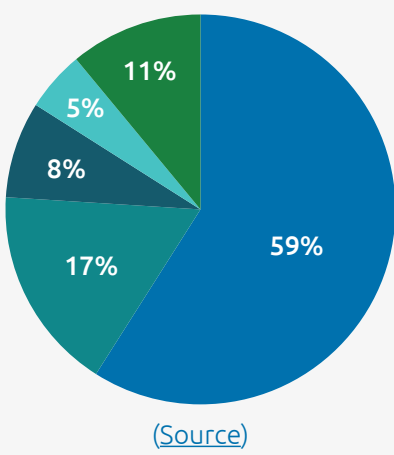


Low-carbon materials are transforming the *electric vehicle industry*

The transportation sector faces a hidden carbon culprit: steel. While the switch to electric vehicles (EVs) tackles fuel emissions,

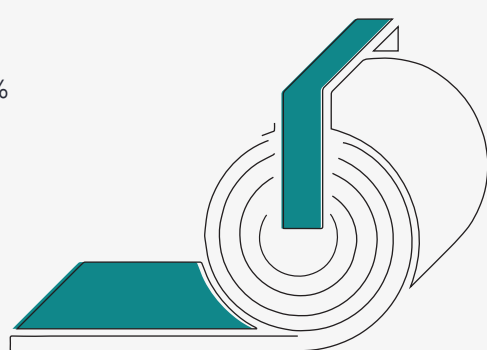
1.85 tons steel production itself generates 1.85 tons of CO₂ per ton and made up roughly eight percent of global emissions in 2018.

Typical passenger vehicle material composition



(Source)

- Steel 59%
- Aluminum 17%
- Plastics and composites 8%
- Magnesium 5%
- Other 11%



Since a complete shift to EVs will take time, the industry urgently needs optimization strategies for all vehicle types.

Recognizing this challenge, the US Federal Highway Administration has stepped forward with a \$2 billion investment in low-carbon materials.

\$2 billion

These emissions-reducing solutions are environmentally friendly and offer cost savings and potential revenue streams.

\$490.8 billion The global market value of low-carbon materials is projected to reach \$490.8 billion by 2028.

Collaboration between key transportation sectors can achieve significant carbon reductions while creating a profitable and sustainable future.

Lightening EVs boost innovation and reduce production costs

Electric vehicles typically weigh around 1,000 pounds more than gasoline-powered cars, which significantly reduces their driving range. The automotive industry is actively exploring lightweight materials like carbon fiber to replace heavier components and improve energy efficiency.

Research shows that a 10 percent weight reduction can also translate to a four percent reduction in manufacturing costs. The key lies in balancing the greater cost of these high-performance materials with a decrease in the overall amount needed.

Sustainability in action

To address this challenge, Toyota launched its innovative injection-molded, fiber-reinforced thermoplastic seat back. This technology delivers a lighter, easier-to-assemble product at a lower cost compared to traditional options.

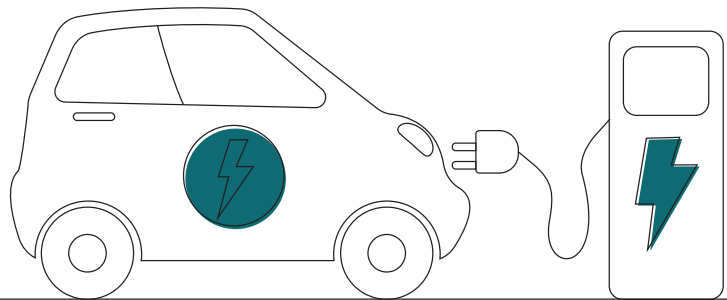
Toyota's material innovation demonstrates the significant potential of lightweight materials to create a future of EVs that are both environmentally friendly and economically viable. Results include:

15% A 15 percent reduction in costs

A 30 percent weight reduction for EVs **30%**

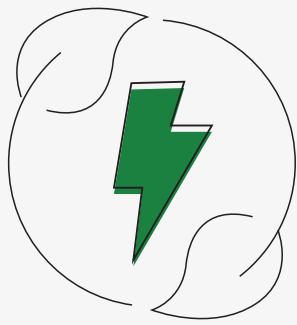
\$2 million An estimated \$2 million in annual savings based on a production volume of 120,000 units at a cost of \$20,000 each

A 2x improvement in safety performance thanks to this innovative material. **2x improvement** (Source)



Recycling conserves resources and the environment

Circular manufacturing practices aim to reduce the need for new materials, conserving resources and lowering environmental impact. This strategy prioritizes minimizing waste by designing vehicles for disassembly, reuse, and recyclability, keeping materials circulating within the system for extended lifespans. A closed-loop or lean supply chain can efficiently manage material recovery and ensure cost-effectiveness.



Sustainability in action

Renault is leading this movement with its trailblazing Refactory, the first circular economy factory dedicated to mobility in Europe.

This innovative facility reconditions 45,000 vehicles annually, projecting a **10 percent operating margin** **10%**

\$2.5 billion and generating an estimated \$2.5 billion in revenue by 2030.

Green steel is manufactured without fossil fuels

Steel production was responsible for eight percent of global greenhouse gas emissions in 2018. Roughly 75 percent of steel is currently produced using coal-fired blast furnaces. Green steel, however, offers a revolutionary solution. Manufactured without fossil fuels, green steel production dramatically reduces its environmental impact.

The Inflation Reduction Act aims to reduce carbon emissions. The US government offers a \$3 per kilogram tax credit for green steel producers. While green steel currently carries a 40 percent price premium, projections suggest it will be five percent cheaper than its fossil-fuel counterpart by 2050. As the industry continues to develop and costs come down, green steel has the potential to revolutionize the steel industry and create a more sustainable future.



Sustainability in action

€4.2 billion Sweden-based H2 Green Steel has secured €4.2 billion in funding to build the world's first large-scale green steel plant and

has sold 1.25 million metric tons of green steel through binding contracts, representing half of its projected annual production. **1.25 million**

95% The company has achieved a 95 percent reduction in CO₂ emissions compared to traditional steel manufacturing.

[Click here](#) to learn about our ongoing partnership with Venture Lab (powered by the Wharton School), and our work on advancing sustainable technologies. Ready to achieve your sustainability goals? Contact us today.

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