

# ALUMINUM: THE ENVIRONMENTAL ADVANTAGE



Today's consumers are not only worried about the performance of their vehicle, but also the environmental "footprint" it is leaving behind. Automotive aluminum continues to be an environmentally friendly material choice because its lightweight quality results in fewer greenhouse gas emissions that contribute to global warming.

In addition, aluminum can help to boost fuel economy, serving to lessen oil consumption and reduce operating costs. The aluminum in vehicles is also highly recyclable, which significantly saves on the emissions associated with primary aluminum production.

While there is no silver bullet for energy and environmental concerns, there is aluminum.

Consider:

## EMISSIONS AND FUEL SAVINGS

- ▶ Each pound of aluminum replacing two pounds of iron or steel in a car can save a net 20 pounds of CO<sub>2</sub> equivalent emissions over the typical lifecycle of a vehicle.
- ▶ A 5 to 7 percent fuel saving can be realized for every 10 percent weight reduction by substituting aluminum for heavier steel, resulting in fewer greenhouse gas emissions (GHG).
- ▶ The application of aluminum in vehicles manufactured in 2006 will lead to potential global savings of approximately 140 million tons of CO<sub>2</sub> equivalent GHG emissions and an energy savings equivalent of about 60 billion liters of crude oil over the lifecycle of these vehicles.
- ▶ Lightweighting the world's transportation fleet – passenger cars, trucks, rail vehicles, air and sea craft – has the potential of reducing GHG emissions by 660 million tons annually, or close to 9 percent of global, transportation-related GHG emissions.
- ▶ The aluminum industry cut factory emissions of perfluorocarbon greenhouse gases by 80 percent between 1990 and 2006.
- ▶ The use of aluminum for vehicle lightweighting can deliver a substantial reduction in CO<sub>2</sub> and other equivalent greenhouse gas emissions over the life of the vehicle through fuel savings, even when considering the CO<sub>2</sub> generated by the initial production of aluminum.

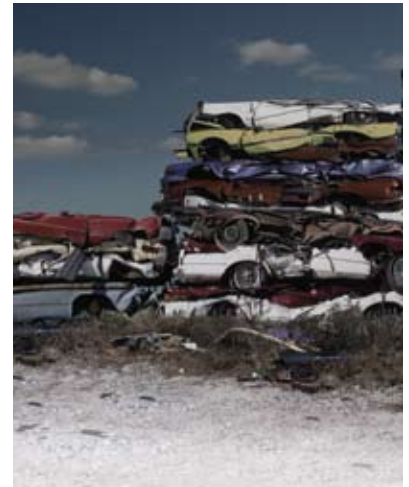
“The company will use different materials, such as more magnesium and aluminum, to make its vehicles lighter, and therefore more fuel-efficient.”

- Bob Lutz, General Motors Corporation vice chairman  
“GM to Use More Magnesium, Aluminum to Lighten Cars”  
Dow Jones, January 15, 2008



## RECYCLING

- ▶ Today, aluminum is the most commonly recycled post-consumer metal in the world.
- ▶ Aluminum is infinitely recyclable without degradation to the material.
- ▶ Nearly 90 percent of automotive aluminum is recovered and recycled.
- ▶ Recycling aluminum saves nearly 95 percent of the greenhouse gas emissions associated with primary aluminum production, only requiring about 5 percent of the energy.
- ▶ In 2006, about 57 percent of the aluminum content in North America was sourced from recycled metal, while 50 percent of aluminum used in Europe and 63 percent in Japan was from recycled metal.
- ▶ The “practical limit” for recycled aluminum in light vehicles, based on the 2006 product mix, is between 58 percent and 63 percent.
- ▶ Aluminum in automobiles accounts for 5 to 10 percent of scrapped automobiles by weight, but represents 30 to 50 percent of its scrap value.



“There is no one silver bullet out there for fuel efficiency. It has to be a myriad of things... reducing the weight of the vehicle, using more aluminum, hybrids.”

- Erich Merkle, IRN analyst  
“Carmakers plan technologies to meet new U.S. fuel rule”  
Reuters, December 19, 2007

