

LIFE CYCLE ASSESSMENT

Government and Automotive Experts Agree: Aluminum Offers Smallest Total Carbon Footprint.

The U.S. Department of Energy's (DOE) Oak Ridge National Laboratory studied life cycle carbon emissions and its peer-reviewed report concluded, "A full life cycle environmental analysis confirms that, when compared to both traditional and advanced steels in the areas of cumulative energy demand, potential ozone depletion and other likely factors in climate change, aluminum rises to the top as the best choice for the environment."

- Ford and Magna International released an LCA comparing a 2013 Ford Fusion to the Mach-I, a prototype lightweight aluminum-intensive sedan that achieved an overall 23 percent vehicle mass reduction and a combined fuel economy of 34 mpg (versus 28 mpg for the steel-bodied Fusion). It proved that by using an aluminum-intensive design, a formerly high-strength steel-bodied car that has reached its max fuel efficiency limit can further lower its environmental impact.
- Rice University's Baker Institute for Public Policy asserts "Per 100 miles driven, improving the fuel economy of a single Ford F-150 by five miles per gallon (MPG) can theoretically achieve the same volumetric gasoline savings that would be accomplished by making a six MPG improvement to six Priuses."
- The Automotive Science Group honored the aluminum-intensive Ford F-150 with the "Best Environmental Performance" award for achieving "the highest level of protection for the environment throughout its life-cycle."

The Facts.

- **Aluminum is more sustainable today than at any time in history.** A peer-reviewed LCA released in 2013 by the Aluminum Association confirms a nearly 40 percent reduction in carbon emissions for N.A primary production since 1995 and growing use of renewable hydroelectric power—from 63 percent of capacity in 1995 to 75 percent today.
- **Aluminum's mass reduction potential is approximately 40%.** Mass reduction achievable with aluminum is often significantly downplayed in competing industry LCA studies. OEM production design studies consistently find mass reduction potential of approximately 40 percent for aluminum and 20 percent for advanced high-strength steel from a mild steel baseline.
- **Recycling for post-consumer aluminum in N. A. exceeds 95 percent.** According to research from the Worcester Polytechnic Institute's (WPI) Center for Resource Recovery and Recycling, automotive aluminum is recovered and recycled from vehicles at end of life at a rate of 95 percent. .
- **Vehicle mass reduction impact on fuel consumption is 25-30 percent higher than reported by some industries.** The steel industry considerably downplays mass reduction induced fuel savings by relying upon fuel consumption factors derived from using the European driving cycle instead of the North American market.

The bottom line: When compared to both traditional and advanced steels, aluminum is the most sustainable choice for the environment.