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Material Use & Recycling—Approach

Alcoa is the largest and most fully integrated aluminum company, which means that we have the capabilities to extract raw materials, process them into aluminum, convert the metal into end-use products or make them available to others for further processing, and recycle aluminum products at the end of their useful life.

We mine bauxite, lignite, coal, and other minerals. We convert the bauxite to aluminum oxide and then to aluminum through processes that use fuels, caustic soda, lime, petroleum coke, coal tar pitch, aluminum fluoride, other chemicals, and water. We also use fuels and hydroelectric facilities to produce electrical energy, which is a major component of the electrolytic process required to produce aluminum metal from aluminum oxide.

The basic process requires approximately four tons of bauxite to produce two tons of aluminum oxide, which, in combination with one-half ton of carbon, can produce one ton of aluminum metal. Once produced, the metal can be used for a wide variety of products. Because it does not rust, decay, or lose its quality, it can be recycled repeatedly without loss of properties.

We also manufacture a wide variety of products from plastics for the packaging, construction, and transportation markets. We typically purchase the resins—polyethylene, high-density polyethylene, polyvinyl chloride, and polypropylene—and convert them to semi-finished and finished products.

We are aware of the importance of materials flow throughout the economies of the world, and we recognize the need to make efficient use of all raw materials and natural assets. To that end, we have developed a materials flow analysis, in conjunction with the International Aluminium Institute, to better understand the global flow of aluminum production, aluminum flows and inventories in customer and consumer products, and recycling loops. This material flow analysis is also being used to quantify and better understand Alcoa's and the industry's current and future environmental aspects and improvement opportunities. For a more in-depth discussion,



please read "[Modelling More Sustainable Aluminum.](#)"

In 2006, we discussed and engaged in material flow analysis with external stakeholders, including the International Aluminium Institute, European Commission—Joint Research Centre (IPTS), the International Energy Agency (Energy Efficiency Division), and researchers at Yale and Tsinghua universities.

We believe that there is economic as well as stewardship justification for minimizing material flows, and we continue our work to make all of our processes as efficient as possible. Examples of programs and actions to make more efficient use of our materials and to encourage and utilize wastes and recycled materials are highlighted in the [Programs & Actions](#) section.