

SHOWCASE PROJECT: ALCOA: ALUMINUM RECYCLING FACILITY

SOLUTION OVERVIEW

Alcoa has expanded its Barberton production plant to include a new 50,000 square foot recycling facility that uses a novel technology to reduce energy use by more than 30 percent relative to the method currently utilized. In addition to the process improvements, co-location of the recycling plant with an existing production facility dramatically reduces trucking needs, leading to a cut in transportation related energy use of about 90 percent. As a result of this project, Alcoa will use about half as much energy to produce and distribute recycled aluminum as it did before the plant was built.

Alcoa's Barberton, OH facility produces finished truck and auto wheels that are forged at the company's Cleveland, OH plant. The new recycling facility takes chips and solids from the forging and machining operations of both the Cleveland and Barberton plants and converts them back into aluminum billets—large cylinders of aluminum, which are subsequently processed into intermediate or final products. The newly cast billet is shipped to Alcoa wheel processing facilities for forging into wheels.

Energy savings are achieved through process improvements and reduced transportation needs. Overall, energy reductions of approximately 50 percent are being experienced, system-wide, with energy savings split roughly equally between process improvements in the plant and transportation reductions. Specifically, the recycling process at the new facility itself is over 30 percent more efficient than a comparable, existing plant. Plus, the recycling facility's location puts it much closer to facilities that both provide raw materials for the recycling process and use the finished, recycled material. The previous practice was to ship scrap material to another Alcoa facility located much farther away. With construction of the recycling plant in Barberton, OH, Alcoa is replacing an 800 mile trip with a 60 mile trip. This results in an approximate 90 percent reduction in transportation energy.

SECTOR TYPE

Industrial

LOCATION

Barberton, Ohio

PROJECT SIZE

50,000 Square Feet

FINANCIAL OVERVIEW

Project Cost \$21 million

SOLUTIONS

Alcoa's new recycling facility is the first of its kind in North America. It uses advanced technology to reduce the energy use and costs to produce wheels from re-melted and scrap aluminum. Construction of the facility was completed in October 2012. The facility has been operating since the fourth quarter of 2012 and is now functioning at full capacity. The facility processes 100 percent recycled material from the neighboring wheel processing plants.

The recycling facility itself is significantly more energy efficient than comparable plants. But this project achieves additional energy savings in at least three other important ways. First, because scrap aluminum is currently sent from Barberton to other facilities for recycling, the construction of a recycling facility on-site reduces transit needs. This cuts energy use and greenhouse gas emissions, while saving the company time and money.

Second, producing aluminum from recycled materials is typically about 95 percent more energy efficient than making it from virgin materials. It requires only 5 percent of the energy to re-melt aluminum as it does to create it from bauxite (aluminum ore). Finally, aluminum wheels are approximately 45 percent lighter than steel, which can lead to significant energy savings—about 1,000 gallons of fuel per year, according to Alcoa.

OTHER BENEFITS

In addition to improving the energy efficiency of the manufacturing process and providing more eco-friendly products such as lighter-weight wheels, the Barberton, OH investment created 30 full-time manufacturing jobs and is helping to protect more than 350 existing positions.

Results have been so successful that Alcoa has plans to construct a second, similar recycling facility at another Alcoa wheel plant.

Baseline point of comparison is a similar facility operated by Alcoa.

Annual Energy Use

(Source EUI)

Baseline()



Actual(2013)



Energy Savings

30%

Annual Energy Cost

Baseline()



Actual(2013)



Cost Savings

30%



A finished wheel



Exterior view of the casthouse



Casthouse exterior