



ArcelorMittal

Sustainability of Steel

World's Most Recycled Material

Steel is the world's most recycled material, and in North America alone, more than 80 million tons of steel are recycled or exported for recycling annually. This constitutes a recycling rate of 69 percent in North America—more than paper, aluminum, plastic and glass combined¹. Steel is recycled for both economic and environmental reasons.

Many steel applications remain in service for decades. Even though two out of every three pounds or kilograms of new steel are produced from “old” steel, the fact that cars, buildings, appliances and bridges have such long service lives makes it necessary to continue to mine virgin ore to supplement the production of new steel. Economic expansion, here and abroad, also creates additional demand that cannot be fully met by available scrap supplies.

A Car to a Can to a Roof and Back to a Car...

Steel possesses a unique material property unrivaled by other materials since it can be recycled both up and down the product value chain. Open loop recycling allows, for example, an old car to be melted down to produce a soup can, and then, as the new soup can is recycled, it is melted down to produce a new appliance, car, roof or perhaps a structural beam used in a bridge.

Recycling in the steel industry is second nature. The North American steel industry has been recycling steel scrap (old steel) for more than 170 years through 2,500



scrap processors and some 12,500 auto dismantlers².

Steelmaking Process

Today's steel is produced using two technologies both of which require old steel to make new steel. ArcelorMittal is a unique steelmaker in that we utilize both technologies. The combination of these technologies enables us the flexibility to produce a variety of steel grades for a wide range of product applications.

Basic oxygen furnace (BOF) technology uses approximately 25 percent steel scrap to make new steel. Steel manufactured by the BOF method is used to produce products that require formability as the primary characteristic. These products include automotive outer body panels, exterior panels for refrigerators and stoves, residential door skins, architectural panels, and packaging such as soup cans.

Scrap-based electric arc furnace (EAF) technology can use nearly 100 percent steel scrap as its feedstock and is used to produce products that require strength as the primary characteristic. Steel from the EAF process is used to produce products

such as structural beams, steel plates and reinforcement bars.

Of the recycled steel used for both technologies, up to 50 percent is post-consumer generated material, and the balance is pre-consumer and home scrap. In addition, regardless of the technology used to make steel (BOF or EAF), both types of steel are fully recyclable, and one type should not be favored over the other.

There are three types of scrap that can be used in the steelmaking process:

- (1) Post-Consumer Content – scrap steel resulting from end of life consumer products (e.g. steel cans, steel auto bodies, building materials)
- (2) Pre-Consumer Content – scrap steel resulting from product manufacturing operations (e.g. turnings, stampings from auto part manufacturers)
- (3) Home Scrap – scrap steel generated internally from our steel processing

As a result of the large quantities of scrap steel we supply to the EAF and BOF, ArcelorMittal is one of the largest consumers of recycled steel in the world.



Environmental Benefits and Reduced Consumption

Recycling steel saves energy and natural resources, with an energy savings equivalent to the energy required to power 18 million households per year¹. In addition, for every ton of steel recycled, 2,500 lbs of iron ore, 1,400 lbs of coal, and 120 lbs of limestone are conserved¹. Or, for every metric ton of steel recycled, 1250 kg of iron ore, 700 kg of coal, and 60 kg of limestone are conserved.

ArcelorMittal is committed to making a progressive reduction in the amount of CO₂ emitted in the steelmaking process over the next decade. Our company has set a target of reducing emissions by 170 kg per tonne of steel produced by 2020.

In North America, the steel industry has made significant strides to protect our environment and preserve our resources by:

- Reducing overall energy consumption per ton of steel produced by 33 percent since 1990

- Reducing greenhouse gas (GHG) emissions (including CO₂) by more than 25 percent from 1994 thru 2003¹
- Collecting and reusing of steelmaking by-products such as slag for road building, railroad ballasts, fertilizer and glassmaking, as well as coke oven and steelmaking gases for fuel/heat generation, etc.¹
- Increased steel manufacturing efficiencies now result in the production of 100 units of steel from 114 units of raw steel vs. 140 units previously¹. This has resulted in a yield improvement from 71 percent up to 87 percent.

As part of our long-term approach to sustainability, we are working to develop breakthrough technologies to recycle steelmaking residues. As a key member of the Ultra-Low CO₂ Steelmaking (ULCOS) project, we are developing a technology that combines CO₂ capture through top gas recycling and possible storage later on.

Significant environmental investments continue to be made in the steel industry to reduce emissions, conserve resources,



and develop new ways to reduce and/or sequester GHGs during steel production.

ArcelorMittal also constantly invests in the development of new environmental processes and more sustainable practices, while working in partnership with its customers to help them develop more sustainable and energy-efficient products.

In the quest for ever more sustainable products, a dedicated environment, lifecycle and material team quantifies the end-to-end impact of the ArcelorMittal steel products, including the evaluation and validation of new products in partnership with the R&D team.



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Visit www.arcelormittal.com and click on Corporate Responsibility > Environment to learn more about our company's commitment to Sustainability.

References:

1. American Iron and Steel Institute
2. The Steel Recycling Institute

Important note:

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