

STEEL SUSTAINABILITY MYTH-BUSTING



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Myth #1:

Green steel will make my project more expensive and take longer to procure.

FALSE.

In fact, if your project uses wide-flange members, your budget and timetable are already based on green steel.

The term “green steel” typically refers to steel produced from recycled ferrous scrap rather than iron ore, coke, and limestone. That steel—which includes every single hot-rolled section steel member produced in the U.S.—is made in an electric-arc furnace that melts the scrap using electricity as the primary energy source.

So even if you aren’t specifically specifying green steel, you’re going to get it! In fact, the average new steel member from a domestic mill contains an average 93% recycled material. Steel can be recycled over and over again with no loss of properties.

Choosing green steel doesn’t involve any compromises. Steel construction products made from green steel meet the same metallurgical and performance standards as products from traditional production methods, and they have the same prices and typical schedules, as well.

In addition to keeping building materials out of landfills, green steel’s global warming potential is one-quarter to one-third that of traditional production methods.

Myth #2:

American structural steel mills are exactly what they were decades ago, with smokestacks belching air pollution.

FALSE.

You’ll find wildlife on the grounds of American steel mills these days—and that’s because the industry has spent the last few decades totally revolutionizing the way steel is made in this country.

All domestic wide flange members are made of an average of 93% recycled steel scrap, melted down with electricity and cast into brand-new members with no loss of strength and durability. This recycled scrap input replaces iron ore, coke, and limestone that is associated with making steel the less sustainable way.

Myth #3:

Other structural materials have a lower environmental impact because I can source them locally.

FALSE.

The difference: Steel’s unmatched strength-to-weight ratio means that you’ll need less of it, wherever you source it. Other materials have ticking clocks—ready-mix concrete, for example, must be placed within two hours.

Steel, however, can be shipped thousands of miles using highly efficient rail or water transport, which are usually available near mills. However, you rarely have to look that far. The U.S. steel supply chain consists of hundreds of steel service centers located throughout the country, stocking months of inventory so that contractors don’t have to.

It’s a commodity product on a national scale with a broad market, whereas concrete and wood are considered regional materials.

Although it’s seen as a regional product, wood can also be shipped great distances—but its low strength-to-weight ratio (just one tenth of steel’s) means that you’ll be shipping a lot more of it, multiplying the environmental impact of transportation.



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Myth #4:
All countries use equally sustainable production methods.
FALSE.

There is enormous variation from country to country. In fact, Chinese structural steel has two to three times the environmental impact of domestically produced structural steel, so simply choosing American-made hot-rolled sections, hollow structural sections, or structural plate is an easy way to cut a project's GWP right out of the gate.

On a global scale, domestically produced structural steel averages 35% to 40% lower greenhouse gas emissions than foreign-made equivalents because U.S. producers primarily use recycled steel scrap as

the feedstock instead of iron ore, coke, and limestone.

Global Warming Potential in kg CO ₂ e per kg of steel		
	Domestic Average	Global Average ¹
Hot-rolled Sections	1.00	1.66
Hollow Rolled Coil (base material for HSS)	1.71	2.62
Structural Plate	1.47	2.47

¹ Worldsteel LCA eco-profile Global – Sections, Plate, Rebar, Hot-rolled Coil, and Welded Pipe, June 2023, Worldsteel Association

Note that this chart actually understates the difference between the impacts of foreign and domestic steel because the inclusion of U.S. steel in the global average artificially decreases that number.

Myth #5:
Steel-making is extractive, making it hard to enter the circular economy
FALSE.

When buildings are demolished or deconstructed at their end-of-life, 98% of the structural steel is recovered. More than 95% of that is melted and recycled into new steel with no loss of properties. Some owners are trying something even greener: reuse of steel members removed intact from a deconstructed building. Steel reuse is on the rise as people design buildings specifically for deconstruction and develop new techniques to take those buildings apart. A market structure for purchasing used steel will also boost adoption. AISC is supporting research on reuse and developing design guidance to make deconstruction an easy option.

Myth #6:
The steel industry lacks innovation on sustainability
FALSE.

The aggressive goal of net-zero structural steel products over the next two decades is not an aspirational goal. It is being aggressively pursued by all stages in the structural supply chain. The structural steel industry has a long history of innovation that has significantly reduced its carbon footprint. That innovation continues today. The transition of steel making from basic oxygen furnaces using iron ore, coke, and limestone to electric arc furnaces using steel scrap and electricity to melt the scrap has reduced the carbon footprint of structural steel by over 50%. Electricity used to melt the steel scrap accounts for over 50% of the current embodied carbon footprint of structural steel.

Producers are actively investing in renewable energy projects with the goal of becoming 100% renewable-based in the near future. A direct reduced iron facility in Ohio converts iron ore to iron pellets, a scrap substitute, without the use of a blast furnace. Producers are investigating carbon capture and using hydrogen instead of natural gas to reheat steel. Steel's future is even greener!

For more information on steel's sustainability, visit [aisc.org/sustainability](https://www.aisc.org/sustainability).



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