



## FACTS ABOUT AMERICAN STEEL SUSTAINABILITY

### Sustainable Steelmaking

The American steel industry is the cleanest and most energy efficient of the leading steel industries in the world. This is due to the high percentage of steel made from recycling scrap to make new steel, and the use of domestically-sourced iron ore pellets, as well as the increasing use of natural gas in place of coal and coke to make iron and steel with lower emissions.

The United States produces a much higher portion of its steel from electric arc furnaces (EAFs) compared to global competitors, resulting in lower emissions of CO<sub>2</sub> from steelmaking. In 2020, 70.6 percent of U.S. steelmaking came from EAFs, compared to 26.3 percent worldwide.

Integrated steel mills in the United States are almost entirely fed by domestically sourced iron ore pellets vs. sintered ore used in China and elsewhere. The use of pelletized iron results in significantly lower emissions of CO<sub>2</sub>, as well as lower emissions of NO<sub>x</sub>, SO<sub>2</sub> and particulate matter.

The energy mix in the United States is also cleaner than in other steel producing locations in the world, with much more reliance on natural gas and renewable energy and this cleaner energy helps provide the cleanest steel.

Current sustainability advancements in domestic steel production include using direct reduced iron (DRI) and hot briquetted iron (HBI) in both integrated and electric arc furnace (EAF) steelmaking. HBI and DRI use natural gas as a reductant and reduce CO<sub>2</sub> emissions vs. pig iron.

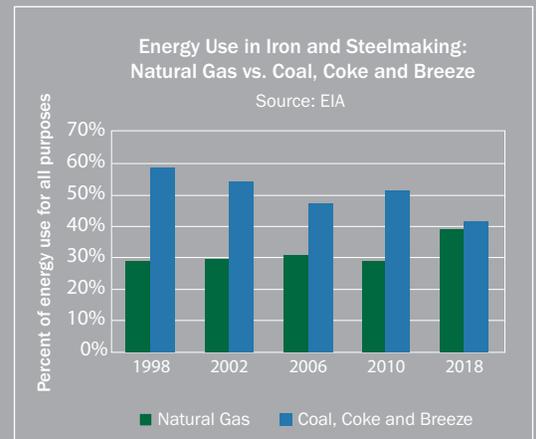
Steel producers in the U.S. have announced specific projects that employ renewable energy to supply all or most of a facility's energy requirements. Additional research is underway to assess the use of carbon capture technology in the steelmaking process. Some steel facilities are also designed with the ability to easily switch between natural gas and hydrogen. More than half of the electricity used at the mines in Minnesota which supply iron ore pellets to integrated steelmakers comes from renewable energy sources.

### ENERGY AND NATURAL GAS:

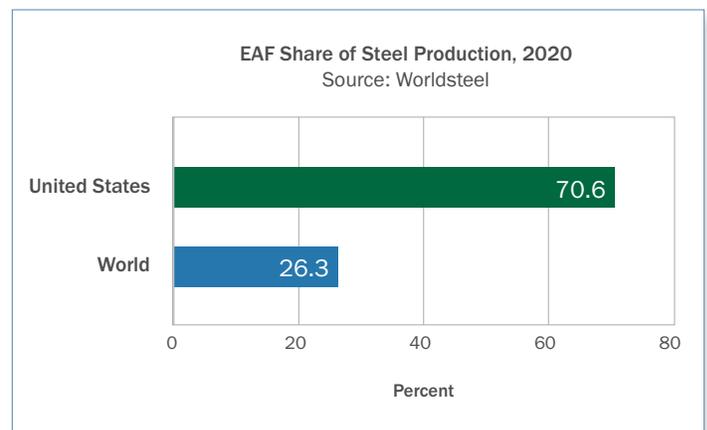
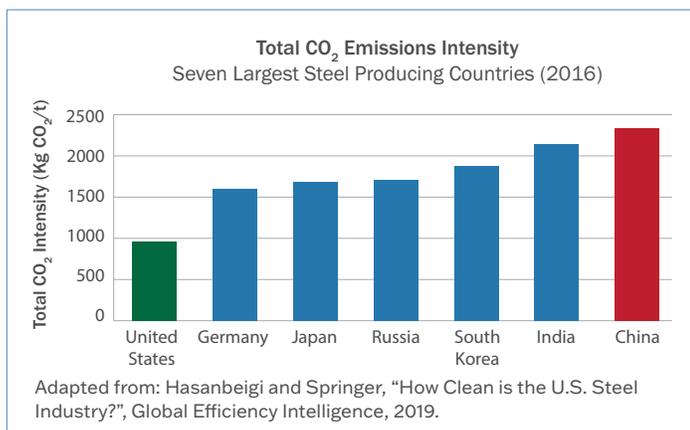
Total iron and steel industry energy use fell by 34 percent between 1998 and 2018.

Natural gas usage has risen from 29 percent of industry energy consumption in 1998 to 39 percent in 2018.

Coal, coke and breeze consumption has fallen from 59 percent of industry energy consumption in 1998 to 42 percent in 2018.



In 2020, imported steel accounted for nearly 28 million metric tons of CO<sub>2</sub> emissions, almost 9 million metric tons more than if the steel had been produced at average U.S. emissions levels.





## American Steel Industry Provides Solutions

Steel is a critical component in the continued development of clean energy and technologies to reduce America's carbon footprint. Wind, solar and tidal renewable energy systems all depend on steel.

For example, steel comprises over 70 percent of the weight of a typical wind turbine. And grain-oriented electrical steel (GOES) has the greatest impact on the efficiency of power and distribution transformers.

### RECYCLING

Steel is the most recycled material on the planet. Once produced, steel can be continually recycled into new steel products—a steel beam can become another steel beam, refrigerator, car door or roof panel. And stainless steel, in addition to being 100% recyclable, can increase the lifetime of many products due to its corrosion resistance and durability.

All steel produced in the U.S. contains recycled content, ranging up to 100 percent for some steel products. For example, structural steel produced in America typically contains 90 percent or more recycled steel. In the U.S. alone, there are typically 60 to 80 million tons of steel scrap recycled per year into new steel products. Based on a three-year rolling average, the U.S. overall steel recycling rate for 2019 is calculated at 69 percent, with rates ranging from 65 percent to 80 percent since 2012.

## Sustainability in Steel Market Applications

### AUTOMOTIVE

Advanced High-Strength Steel (AHSS) helps auto manufacturers to reduce the mass of vehicles while maintaining safety standards, thereby increasing fuel economy and reducing tailpipe emissions.

In electric vehicles (EVs), thinner advanced grades of steel enable optimization of space allowing for packaging of more batteries, which means greater range on a single battery charge.

### CONSTRUCTION

In the construction market, higher-strength steels allow the construction of more efficient steel bridges and buildings using less material, thereby resulting in lower overall CO<sub>2</sub> emissions.

Steel for short span bridges is lighter than other materials and can provide a savings of up to 25 percent in total superstructure costs, in part because heavier equipment may not be needed to set the girders. New technology, like press-brake-formed steel tub girder bridges, provides an expected service life of more than 100 years and can be installed in a day or two.

