



Summary of Greenhouse Gas Emissions from Iron and Steel  
Production and Metallurgical Coke Production,  
from Section 4.16 of EPA's Inventory

“Iron and steel production includes six distinct production processes: coke production, sinter production, direct reduced iron (DRI) production, pig iron production, electric arc furnace (EAF) steel production, and basic oxygen furnace (BOF) steel production.” (p. 4-59)

Metallurgical Coke Production

The inventory separates greenhouse gas emissions for metallurgical coke production from other greenhouse gas emissions from the iron and steel industry. (p. 4-59 through 4-67)

“Emissions of CO<sub>2</sub> and CH<sub>4</sub> from metallurgical coke production in 2013 were 1.8 MMT CO<sub>2</sub> Eq. (1,822 kt) and less than 0.05 MMT CO<sub>2</sub> Eq. (less than 0.5 kt), respectively (see Table 4-57 and Table 4-58), totaling 1.8 MMT CO<sub>2</sub> Eq.” (p. 4-60). [1]

Iron and Steel Production

While the coke manufacturing process itself does not generate a large portion of carbon dioxide emissions from the iron and steel sector, much of the carbon dioxide emissions from the iron and steel manufacturing process are attributable to the use of the coke as a raw material. Page 4-59 (“The majority of CO<sub>2</sub> emissions from the iron and steel production process come from the use of coke in the production of pig iron and from the consumption of other process byproducts, with lesser amounts emitted from the use of flux and from the removal of C from pig iron used to produce steel.”).

“Emissions of CO<sub>2</sub> and CH<sub>4</sub> from iron and steel production in 2013 were 50.5 MMT CO<sub>2</sub> Eq. (50,466 kt) and 0.7 MMT CO<sub>2</sub> Eq. (27.7 kt), respectively (see Table 4-59 through Table 4-62), totaling approximately 51.2 MMT CO<sub>2</sub> Eq.” (p. 4-60)

In the case of CO<sub>2</sub>, the emissions from metallurgical coke production are less than one-twentieth of the emissions from iron and steel production. In the case of CH<sub>4</sub>, the emissions from metallurgical coke production are less than one-tenth of the emissions from iron and steel production.

### Total Emissions

Total methane emissions from both metallurgical coke production and iron and steel production were 0.7 MMT CO<sub>2</sub> Eq. (p. ES-6, Executive Summary, Table ES-2). This was approximately one-tenth of one percent of total methane emissions for the entire United States (696 MMT CO<sub>2</sub> Eq.).

In 2013, total carbon dioxide emissions from both metallurgical coke production and iron and steel production were 52.3 MMT CO<sub>2</sub> Eq. (million metric tons of CO<sub>2</sub> equivalent). Executive Summary, ES-5, Table ES-2. This was approximately one percent of the total carbon dioxide emissions for the entire United States (5,505.2 MMT CO<sub>2</sub> Eq.).

It is important to understand that the data do not include emissions from conventional fuels consumed for energy purposes by the iron and steel industry, which are accounted for separately in the section of the report relating to energy. (p. 4-59) (“Emissions from conventional fuels (e.g., natural gas, fuel oil, etc.) consumed for energy purposes during the production of iron and steel are accounted for in the Energy chapter”).

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[1] Greenhouse gases do not have the same Global Warming Potential (potential for increasing the heat on the surface of the planet). To make comparisons easier, EPA has assigned a unit value of 1 to refer to the Global Warming Potential for carbon dioxide, and assigned multipliers for other greenhouse gases. For example, methane has a Global Warming Potential that is 20 times the Global Warming Potential of carbon dioxide. As a result, the inventory converts emissions calculations for methane into equivalent amounts of carbon dioxide emissions.

Source: “Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2013”, <http://www3.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2015-Main-Text.pdf> (pages 4-59 to 4-67)