

Coal & Steel Facts 2011

Steel Production

Global steel production is dependent on coal – around 68% of total global steel production relies directly on inputs of coal. Around 760Mt of coking coal and Pulverised Coal Injection (PCI) coals are used in global steel production, which is around 12% of total hard coal consumption worldwide.

Crude Steel Production

2010	1414Mt	2006	1247Mt
2009	1227Mt	2005	1144Mt
2008	1329Mt	2004	1072Mt
2007	1346Mt	2003	970Mt

In 2010, world crude steel production was 1,414 million metric tons. This was an increase of 15% compared to 2009, a new record for global crude steel production.

Top Ten Steel Producers (2010)

PR China	627Mt	South Korea	58Mt
Japan	110Mt	Germany	44Mt
USA	80Mt	Ukraine	33Mt
India	68Mt	Brazil	33Mt
Russia	67Mt	Turkey	29Mt

Processes

Currently almost 70% of global steel is produced in Basic Oxygen Furnaces (BOF). Coking coal is converted to coke, which is then used in the blast furnace to smelt iron ore. The resulting molten iron is then taken to the BOF, where steel scrap and limestone are added. A stream of high purity oxygen is blown through the molten bath to remove impurities, leaving almost pure liquid steel.

About 770 kg of coal are required to produce 1 tonne of steel in this production route.

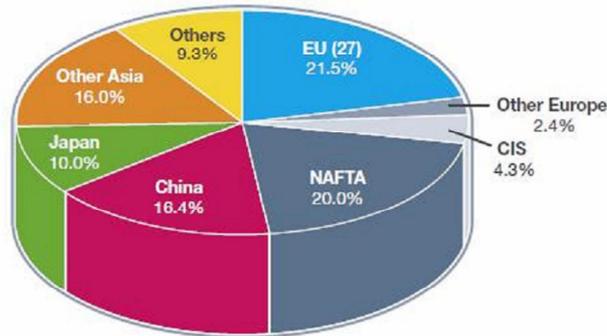
A further 29% of steel is produced in Electric Arc Furnaces (EAF); much of the electricity used in this process is generated from coal-fired power stations.

About 150 kg of coal are required to produce 1 tonne of steel in Electric Arc Furnaces.

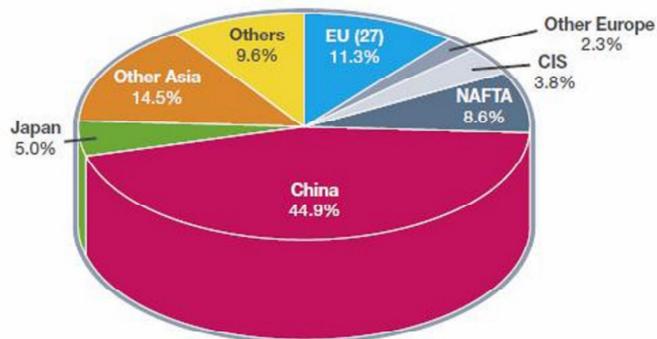
Steel Use

There was a 69% increase in steel use worldwide between 2000 and 2010, with China experiencing an increase of over 400% for the same period.

Global Use of Steel in 2000



Global Use of Steel in 2010



Top Users of Steel (2010)

PR China	576Mt	Germany	36Mt
USA	80Mt	Russia	36Mt
Japan	64Mt	Brazil	27Mt
India	61Mt	Italy	25Mt
South Korea	52Mt	Turkey	23Mt

Per Capita Use of Steel (2010)

Per capita use of steel varies significantly around the world (kg per capita):

South Korea	1077kg	USA	258kg
Chinese Taipei	772kg	Russia	256kg
Japan	503kg	Brazil	132kg
PR China	427kg	India	52kg
Germany	441kg	World	203kg

Metallurgical/Coking Coal Trade

Total world coking coal trade increased by 28.1% to 270.9 Mt in 2010. Coking coal trade represented 25% of the total global coal trade in 2010.

Top Coking Coal Exporters (2010e)

Australia	155Mt	Czech Republic	4Mt
USA	51Mt	New Zealand	2Mt
Canada	27Mt	Indonesia	2Mt
Russia	14Mt	Poland	2Mt
Mongolia	11Mt	South Africa	1Mt

Major Coking Coal Importers (2010e)

Japan	58Mt	Ukraine	10Mt
PR of China	48Mt	Germany	8Mt
India	30Mt	Turkey	7Mt
Korea	28Mt	UK	6Mt
Brazil	12Mt	Italy	5Mt

Pulverised Coal Injection (PCI)

A technology for injecting coal directly into the blast furnaces. One tonne of PCI coal used for steel production displaces about 1.4 tonnes of coking coal. Coals used for pulverised coal injection into blast furnaces have more narrowly defined qualities than steam coal used in electricity generation.

PCI Coals Used in Blast Furnaces

2009	30Mt	2006	31Mt
2008	37Mt	2005	30Mt
2007	39Mt	1990	11Mt

Major Consumers of PCI Coals (2009)

Japan	9Mt	India	3Mt
South Korea	6Mt	Germany	2Mt
Russia	3Mt	France	1Mt

Steel Recycling

Steel is 100% recyclable, with some 450Mt of recycled steel consumed in 2004. The BOF process uses up to 30% recycled steel (scrap) and around 90-100% is used in EAF production.

Sources: **IEA** & **World Steel Association**
(Mt - million tonnes / e - estimated)

August 2011
World Coal Association