



is a leading steel information service in Englewood Cliffs, N.J., USA.

WSD's steel experience, steel database and availability of steel statistics are the principles for performing steel forecasts, studies and analysis for international clients. WSD seeks to understand how the "pricing power" of steel companies the world over will be impacted by changes in the steel industry's structure. The views and opinions expressed in this article are solely those of World Steel Dynamics and not necessarily those of AIST.

For more information, email wsd@worldsteeldynamics.com.



Authors

Philipp Englin (top row, left)
Chief Executive Officer, World Steel Dynamics, Englewood Cliffs, N.J., USA

Adam Green (top row, right)
Managing Director, World Steel Dynamics, Englewood Cliffs, N.J., USA

John Villa (bottom)
Senior Research and Operations Director, World Steel Dynamics, Englewood Cliffs, N.J., USA

"Green Steel Revolution": Will it make way for the end of the "Age of Protectionism"?

In a previous Strategic Insights, WSD listed some "Green Revolution" pros and cons for steel mills. WSD believes that a number of upside forces that have caused the current steel industry "Golden Profit Age" environment are medium to longer term in nature, which include:

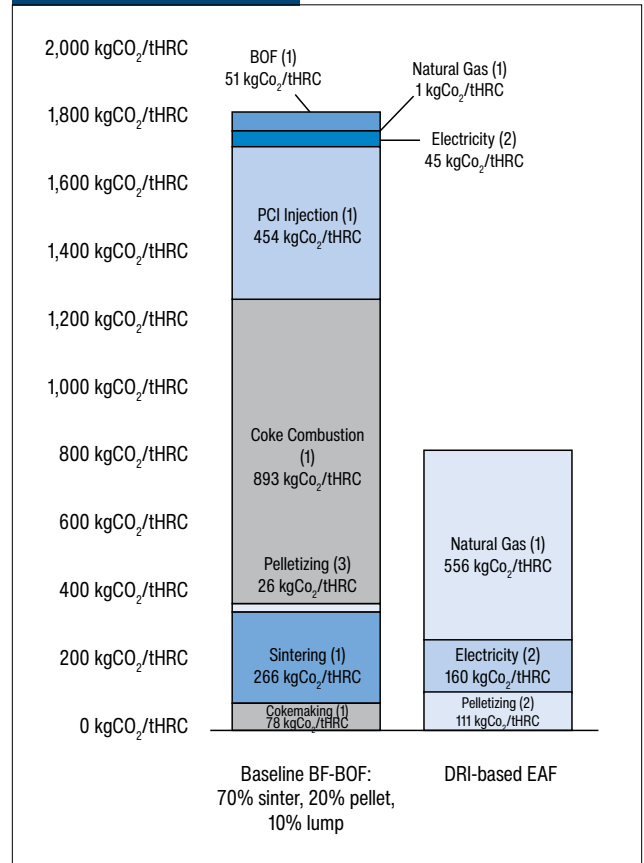
- The "Green Steel Revolution" — the drive to decarbonize steelmaking the world over — will require a monumental incremental increase in both capital spending and operating costs for steelmakers. Consider the situation for a "pro forma" 5-million-metric-ton-per-annum blast furnace (BF)/basic oxygen furnace (BOF)-based sheet mill seeking to become carbon neutral in the years ahead:
 - One approach to achieving this outcome, seemingly embraced by EU-based companies, is the conversion of upstream operations into a direct reduced iron (DRI)-fed electric arc furnace (EAF) process. On this interim basis, based on WSD's "Green Steel Monitor" system, the CO₂ footprint would be reduced from roughly 1.9–2.2 metric tons of CO₂ per metric ton of hot-rolled band to about 1.1–1.3 metric tons (Fig. 1).
 - On a high-level basis, WSD estimates the capital cost required for this conversion, assuming no investment on the part of the steelmaking company in hydrogen-related infrastructure, would be about US\$1.5–2.0 billion.
- The enormous increase in demand for both obsolete and prime grades of scrap due to the implementation of new steelmaking technologies, to a great degree as a consequence of the Green Steel Revolution, will impact operating costs and elevate the price "floor" for steel products.
- In the U.S., albeit this is not yet directly attributable to the Green Steel Revolution, a similar paradigm has been underway for decades whereby BF/BOF-based steel production is being gradually replaced by scrap-intensive EAF steelmaking.
- The "Age of Protectionism" that came about as a result of the massive increase in low-priced (often well below the marginal cost of production) Chinese exports of steel products in 2015–2016 is alive and well:
 - In the U.S., the Section 232 tariffs implemented by the Trump administration remain largely in effect despite a change in presidential and partisan leadership. A movement toward loosening the policies via tariff rate quota (TRQ) arrangements with historically "friendly" trading partners, such as the EU, Japan and others, is likely to somewhat weaken the effect of this barrier; however, it appears that its complete elimination is highly unlikely.
 - The EU has recently extended its own TRQ-based system for another 3 years which had been implemented shortly after the U.S. announcement of

- the Section 232 measures in 2018; the extended system remained largely unchanged from its original stipulations.
- China has implemented its own measures to limit exports in the face of continued external pressure to reduce overcapacity and, as discussed earlier, “encapsulate” its domestic market. The removal of the 13% value-added tax on hot-rolled band exports could be extended to a number of other steel products in the years ahead, especially if Chinese demand falters and new pressure(s) arise to keep its exports at bay.
 - Prior to the invasion, both Russia and Ukraine announced a variety of measures to tax exports of both raw materials (steel scrap especially) and finished steel goods.
 - Thailand has also announced new import duties on hot-rolled band from Egypt and Vietnam ranging from ~5% to 42%, depending on the mill.

Overall, there’s no doubt governments and policy-makers the world over have increased their efforts to protect the interests of their respective domestic steel industries, as well as other sectors impacted by the “globalization” trends that acted as the dominant macroeconomic force prior to 2016. The Green Steel Revolution and the broader Green Revolution is likely to only amplify the Age of Protectionism, in WSD’s opinion, given the unprecedented capital required to implement these “green” policies will further intensify regionally protective instincts.

This report includes forward-looking statements that are based on current expectations about future events and are subject to uncertainties and factors relating to operations and the business environment, all of which are difficult to predict. Although WSD believes that the expectations reflected in its forward-looking statements are reasonable, they can be affected by inaccurate assumptions made or by known or unknown risks and uncertainties, including, among other things, changes in prices, shifts in demand, variations in supply, movements in international currency, developments in technology, actions by governments and/or other factors. ◆

Figure 1



CO₂ emissions by process type (including scope 1, 2 and 3 emissions).