World and US Production of DRI and HBI

This white paper has been created in conjunction with and American Metal Market and Metal Bulletin Events’ upcoming DRI and Mini-mills Conference being held on September 10-11, New Orleans, LA.

The data and trends examined in this paper, and many others, will be addressed by expert speakers and panellists at the event.
A burgeoning DRI market in North America has the potential to be an industry game changer, the shale gas revolution and the resultant affordable natural gas has put DRI production firmly back on the agenda. DRI offers unique opportunities for mini-mill steel makers to tap into the iron ore market and protect against the volatility of the steel scrap market.

DRI can open up new commercial avenues and streamline the steel making process both in terms of efficiency and cost and finished product markets. This could be one of the most influential shifts in the steel industry for decades and will have ramifications across the entire supply chain.

The below graphical representation outlines the continuing growth in DRI consumption worldwide, it is clear to see that DRI is growing in popularity and is being utilized by more and more steel makers each year.
The shape of the DRI production curve is even more informative when viewed in comparison to world crude steel production. The effects of the financial crisis in 2009 were less severely felt in the DRI production statistics further enhancing the view that the cost and efficiency benefits of using DRI in steel making are even more important during periods of financial difficulty when steel makers’ profit margins are particularly tight.

**World Production of Crude Steel ('000 tonnes)**

![Graph showing world production of crude steel from 1997 to 2012](image-url)
This figure graphically represents the crude steel production share of both primary BOF facilities and secondary mini-mill based steel makers. The majority of steel is produced by mini-mills which indicates not only the inherent environmental and feedstock advantages of EAFs but also represents the huge potential market for DRI in the US. DRI will not necessarily increase the crude steel market share for mini-mills but it does provide mini-mill operators with the flexibility of feedstock and the opportunity to tap into the iron ore market.

Steel Production by Type in the U.S.

- Crude Total (Mt)
- BOF Total (Mt)
- EAF Total (Mt)
As the below graph contests EAF’s share of crude steel making has been on the rise in recent years and the forecast outlines how EAF steel making will overtake traditional BOF steelmaking routes by 2030. Globally the balance between EAF and BOFs will become more similar to the current balance in the US (see next graph). The efficiency, feedstock flexibility and environmental advantages of EAFs make them a much more attractive investment for future capacities, especially with new carbon emission laws and growing steel scrap reservoirs.
The shale gas revolution is the undoubted catalyst for US DRI production. The below figure outlines how DRI capacities are likely to grow exponentially with reliably low natural gas prices, whilst natural gas prices stay competitive DRI based steel production is likely to remain an attractive, cost effective option.

Shale Gas and DRI Production

Source: WSA, Wood Mackenzie Steel Market and Global Gas Service
The Rise of EAFs

The rise of EAF based steel making both in the US and globally is being driven by a combination of factors:

- **Environmental** – EAF based steel making generates significantly less carbon emissions than the traditional BOF route, both in actual production process and because they predominantly utilize and recycle ferrous scrap. As more carbon emission taxes and restrictions are being enforced by governments across the globe, this factor will only grow in importance.

- **Flexibility** – The volatility of raw material prices and slackening of global steel demand makes the flexibility of EAFs even more important. EAFs are considerably more flexible than primary steel maker and can economically and efficiently reduce their output and capacity according to market pressures.

- **Feedstock** – The traditional BF and BOF route are reliant on coking coal supplies which are beginning to tighten. EAFs do not have any coal requirements and are therefore unaffected from the dwindling coking coal availability.
DRI and Mini-mills Conference

This white paper has been created in conjunction with American Metal Market and Metal Bulletin Events’ upcoming DRI and Mini-mills Conference being held on September 10-11, New Orleans, LA. With over 120 delegates expected, this is an ideal opportunity to meet your customers and suppliers in the burgeoning market as well as hearing from the senior level decision makers at market leading companies discuss the following:

- The growing role of DRI in the North American steel industry
- Shale gas availability and its ramifications for manufacturing and steel making
- The applications and advantages of DRI in mini-mill operations
- A detailed evaluation and comparison of the available DRI technologies
- An overview of potential DRI projects in the region
- DRI/HBI as a merchant product
- DRI logistics – the safe handling and shipping of DRI
- A comparison of ore based metallics and their uses
- Comprehensive analysis of DR grade iron ore pellet availability
- EAF technologies – how they are maximizing efficiency
- Burdening optimization and procurement strategies for mini-mills
- Vertical integration and mitigating volatility through raw material control

Unless specified, all data is sourced from Metal Bulletin Research and presentations delivered at Metal Bulletin Events
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Home
- World Production of DRI and HBI
- World Production of Crude Steel
- Steel Production by Type in the U.S.
- Global Steel Production by Type
- Shale Gas and DRI Production
- The Rise of EAFs
- DRI and Mini-mills Conference

Back Page

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