

Venezuela steel: losing importance in DRI

Venezuela's share of world DRI/HBI production has declined steadily since its pre-eminence in 1983. Initially this was due to technical problems but since the nationalisation of producers in 2008 & 09 output has further deteriorated.

By Germano Mendes de Paula*

ONCE, Venezuela played a prominent role in the production of DRI and HBI. HBI is hot briquetted DRI better suited for export than DRI which oxidises during storage and transport.

The country was considered for decades as one of the best locations to produce these direct reduced iron products in the world. This was due to a combination of factors:

- large iron ore reserves in the Guayana region, where direct reduction modules are located;
- huge proven reserves of natural gas;
- the Guayana region is the centre of hydro electric power generation in Venezuela;
- rivers provide ample water supplies and transportation routes.

Unfortunately, starting in 2006, DRI/HBI production in Venezuelan has been experiencing a downward trend.

The development of direct reduction output in Venezuela can be divided into three phases, as explained below.

Phase 1: World Leadership

The first direct reduction module – based on High Iron Briquette (HIB) process developed by US Steel – was installed in Venezuela in 1974 by Minorca, a subsidiary of Ferrominera Orinoco (FMO).

It was the initial attempt of employing a fluid bed direction reduction technology. However, due to a number of operational problems, it was shut down in 1981.

Next, in 1976, FIOR de Venezuela commissioned a process they named FIOR, also using fluid bed technology. It faced various mechanical and process troubles. As a consequence, initial production was quite limited.

Sidor preferred to adopt proven technologies. It brought on stream eight modules (four HyL and four Midrex) during 1976 to 1981.

In the following year, Venezuela surpassed Mexico as the world's largest DRI/HBI producer.

In 1983, Venezuela produced 2.4Mt of DRI/HBI (Fig 1 left axis), which accounted for 31.2% of the global output (Fig 1 right axis). This was the maximum share of production ever achieved by Venezuela; and can be considered as the final year of this first phase.

Phase 2: Exported Oriented Growth

From 1984 to 1989, production growth was derived from higher use of the installed equipment. Two new plants were commissioned in 1990: OPCO and Venprecar.

OPCO was, in fact, a conversion of Minorca's facility from HIB to the Midrex shaft furnace process. The new player used much of the existing installation. OPCO was a consortium led by Kobe Steel of Japan, the parent company of US based Midrex.

Sivensa – which had acquired FIOR de Venezuela in 1986 – decided to build Venprecar, based on Midrex technology. Venprecar was inaugurated in 1990. Approximately 55% of its DRI/HBI production was consumed by Casima, a Sivensa subsidiary dedicated to making carbon steel long products.

Comsigua, a consortium of Japanese investors, with FMO, Tamsa and the IFC, started-up a Midrex Megamod module in 1998. It was focused on exports. Posven, a consortium led by Posco, commissioned HyL modules in 2000, also looking at the international market. But it experienced technical, labour and market problems, being idle in 2001. It was acquired by Matesi, a joint venture between Tenaris (50.2%) and Sidor (49.8%) in 2004. Orinoco Iron, a 50:50 joint venture between BHP and IBH (controlled by Sivensa and FMO), using Finmet fluid bed technology, began operations in 2000, but faced adverse conditions and operated with large idle capacity initially.

Even with Posven and Orinoco Iron's hurdles, Venezuela produced 3.6Mt of DRI and 3.2Mt of HBI in 2002. This combined quantity was more than double that produced in 1987. Additionally, it exported 2.9Mt of HBI in 2002, which accounted for 91% of the country's HBI output. Despite this, Venezuela's share of DRI/HBI world production decreased to 15.2%, mainly because of the geographical relocalisation of DRI production to India where coal based kilns dominate and the Middle East with its abundant gas.

In 2003, India became the largest DRI/HBI producer in the world. Venezuelan DRI/HBI output increased substantially until 2005, when it reached 8.9Mt (15.6% of world output), of which 4.9Mt was HBI and 4.0Mt was DRI.

HBI exports achieved a peak of 4.0Mt (82% export ratio) that year.

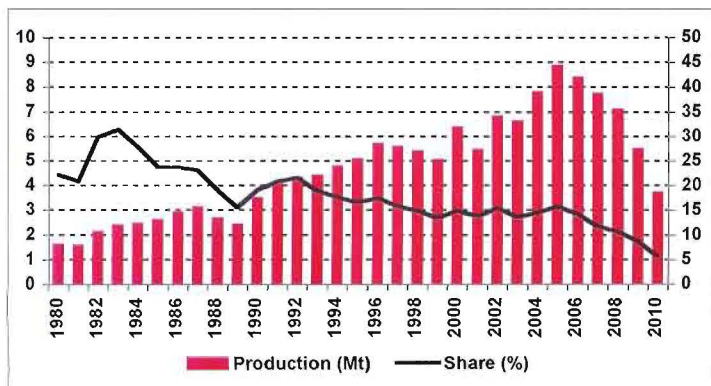
Phase 3: Temporary Retraction?

Venezuelan DRI/HBI production dropped to 8.4Mt in 2006, and has since declined steadily – 7.8Mt/2007; 7.1Mt/2008; 5.5Mt/ 2009 and 3.8Mt/2010. It cannot be due to unfavourable international conditions, as the world steel industry was in good shape up to Q3 2008. Its crisis is more related to domestic factors.

In 2007, FMO, a State-Owned Enterprise (SOE), took over OPCO, because the leasing contract with the consortium led by Kobe Steel expired. This plant became known as FMO. The Venezuelan government decided to renationalise Sidor in 2008 and to nationalise HBI producers, Orinoco Iron, Venprecar, Comsigua, and Matesi, in 2009. Sidor, which has its own DRI plant and uses the electric furnace route for steel production has seen crude steel production fall steadily from 4.3Mt in 2007 to 3.5Mt in 2008, 3.0Mt in 2009 and roughly 1.8Mt in 2010. To a large extent this is due to a need to rationalise electricity consumption in the country. The lack of electricity and ore pellets has seriously affected these producers. Comsigua and Venprecar, for instance, has considered importing pellet from Brazil. It is estimated that Comsigua's production decreased from 0.7Mt in 2007 to around 0.6Mt in 2010. At the same time, Orinoco Iron's output more than halved from 1.2Mt to 0.5Mt, while Venprecar fell from 0.55Mt to 0.4Mt. Matesi was shut down in November 2008.

Matesi, renamed Briquetera de Venezuela (Briqven), re-started its activities in December 2010. Its current annualised production will be 0.7Mt, implying a 50% idle capacity. Its second module is expected to recommence operation in July 2011. FMO intends to resume normal deliveries of ore to HBI producers from Q1 2011. Sidor plans to achieve 98% capacity utilisation in 2011, allowing it to more than double its output to 4.3Mt crude steel.

Even accepting that some production recovery should occur, Venezuelan DRI/HBI severely lost momentum and its traditional prominence to other nations. India, Iran and Saudi Arabia all now exceed its output. ■



Venezuelan DRI/HBI production and share of world output

Company	Technology	Date	Comments
Minorca/FMO	HIB	1974	Fluidised bed; converted to Midrex (OPCO)
FIOR	FIOR	1976	Fluidised bed; renamed Operaciones rDI; shut down
Sidor	Midrex & HYL	1976-1981	Shaft furnaces; one new HYL module was inaugurated in 2009 and a smaller closed
OPCO	Midrex	1990	Former Minorca's HIB; renamed FMO
Venprecar	Midrex	1990	
Comsigua	Midrex	1998	
Posven	HYL	2000	Renamed Matesi and eventually Briqven. Idle from November 2008 to December 2010
Orinoco Iron	Finmet	2000	Fluidised bed

Table 1 History of DRI/HBI plants in Venezuela prior to nationalisation in 2008-09

*Professor in Economics, Federal University of Uberlândia, Brazil. Email germano@ufu.br