



2018

WORLD DIRECT REDUCTION STATISTICS

MIDREX

www.midrex.com



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New Capacity, Plant Ramp-Ups Boost World DRI Production Over 100M Tons in 2018

Annual global DRI production reached the lofty milestone of 100 million tons in 2018, riding the crest of double-digit growth for the second consecutive year. DRI output was up 15% over 2017 performance. From 2016 to 2018, world DRI production has increased by 38%, which is the largest increase in any two-year period since 1985. The sustained growth through 2018 was driven primarily by strong demand for natural gas-based DRI – an environmentally friendly and low residual metallic that is needed to produce today’s premium steel products.

Combined, India and Iran were responsible for more than half of total world DRI production in 2018.

The top five DRI-producing countries last year:

2018 Top 5 DRI Producing Nations

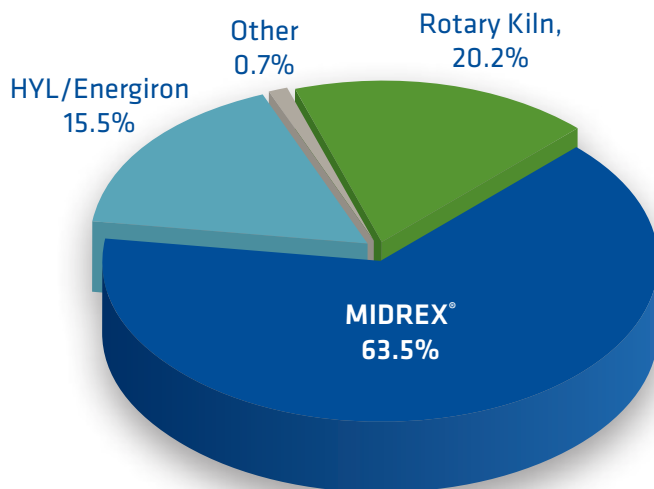
| COUNTRY | PRODUCTION (Million Tons) |
|--------------|---------------------------|
| India | 28.11 |
| Iran | 25.75 |
| Russia | 7.90 |
| Saudi Arabia | 6.00 |
| Mexico | 5.97 |

Source: World Steel Association, SIMA, and Midrex Technologies, Inc.

Over 11 million tons of last year’s production was hot DRI (HDRI), which is fed directly to the EAF to reduce energy consumption and increase melt shop productivity. Hot briquetted iron (HBI), which is compacted DRI, accounted for 9 million tons of the 2018 total.

Midrex production grew to nearly 64 million tons, which was a 13% increase over 2017.

2018 World DRI Production by Process



Total World Production: 100.5 Mt

| | 2016 | 2017 | 2018 |
|---------------|-------|-------|-------|
| MIDREX® | 64.8% | 64.8% | 63.5% |
| HYL/Energiron | 17.4% | 16.9% | 15.5% |
| Other | 0.3% | 0.7% | 0.7% |
| Rotary Kiln | 17.5% | 17.6% | 20.2% |

Source: Midrex Technologies, Inc.



BEHIND THE NUMBERS

Three factors contributed to 2018 production increases: the commissioning of new capacity, especially in Iran, the return to operation of many coal-based rotary kiln furnaces in India, and the further ramp-up of recently commissioned plants.

Iran produced over 25.7 million tons of DRI, all using natural gas, which easily made Iran the number one gas-based producer in 2018. By the end of the year, there were 33 direct reduction modules operating in Iran and at least a dozen more were in various phases of construction. DRI capacity growth has been phenomenal – three-and-one-half times more capacity now than one decade earlier – especially considering the international sanctions placed on the country.

DRI production in India surged to over 28 million tons in 2018, placing it firmly in the lead of all DRI-producing nations. It is estimated that approximately 30% of all DRI and HBI produced last year within India was transported to a steelmaking facility off-site. A very large share of this was via truck transport to nearby melt shops.

Most of the output – nearly 20 million tons – was by rotary kiln plants which use coal as the fuel and the reductant. According to the Sponge Iron Manufacturers Association (SIMA), headquartered in Delhi, there are 315 of these units in operation. The yearly production by these rotary kilns was 35% higher than in 2017.

Another contributor to increased DRI output within India was the stabilization of the COREX® export gas-based and coke oven gas-based plants. The MIDREX® Plants at JSW Steel (Toranagallu) and JSW (Dolvi) set production and performance records during the year while operating with COREX export gas and coke oven gas, respectively. Indian



JSW Steel Toranagallu in Karnataka, India

production would be much greater but for the low availability and high cost of natural gas. Production of natural gas-based DRI was 8.14 million tons, an increase of 8% over 2017.

Russia again was the third largest producer of DRI and HBI, accounting for 7.9 million tons, a 13% increase over 2017. This primarily was due to the continued ramp-up of capacity by the newest MIDREX Plant (HBI-3) at Metalloinvest's Lebedinsky GOK in Gubkin, Belgorod region. The HBI-3 Plant has a design capacity of 1.8 million t/y, which gives Metalloinvest an installed annual production capability of 4.5 million tons and reinforces its leading position in the global merchant HBI market.

Saudi Arabia vaulted into fourth place among DRI producers, making 6.00 million tons in 2018, to surpass Mexico, which declined slightly to 5.97 million tons.

Egypt joined the nations producing more than 5 million tons, which is nearly double its output of 10 years earlier. UAE DRI production continued to increase, as it made 3.78 million tons only 8 years after entering the industry.

Venezuelan production fell to less than 1 million tons, which is a little more than 10% of its peak output in 2005 and the lowest performance in 40 years.

There has been notable growth within the USA, due to the combination of an intense demand for low residual iron units and the availability of low-cost natural gas. After the industry was completely shuttered from 2009-2013, the USA produced 3.35 million tons in 2018, with the expectation of significantly greater figures in the coming years.

Algeria joined the ranks of DRI-producers in 2018, with the start-up of a 2.5 million t/y MIDREX Combination HDRI/CDRI Plant for Tosyali Algerie, located near Oran, Algeria.



LGOK HBI-2 and HBI-3 in Gubkin, Russia



NEW CAPACITY AND PLANTS UNDER CONSTRUCTION

MIDREX®

NEW CAPACITY

World's Largest Single Module HDRI/CDRI Plant Begins Operations at Tosyali Algeria



Tosyali Algeria started up and commissioned a 2.5 million tons per year (t/y) DRI plant equipped with a MIDREX MEGA-MOD® furnace, which is capable of simultaneous production of hot and cold DRI (HDRI and CDRI, respectively) to match the requirements of the steel mill. HDRI from the MIDREX Plant is expected to help substantially increase billet production and boost high-quality rebar production to more than 3 million t/y.

Tosyali Algeria started production of steel rebar in Bethioua, near Oran, Algeria, in 2013, by using scrap as feedstock. It subsequently added 500,000 t/y of wire rod production capacity, which was started up in 2015. At this point, the decision was made to add a direct reduction plant, supplied by Midrex Technologies, Inc. and its consortium partner, Paul Wurth. Commissioning of the world's largest single module DRI plant was completed in July 2018 and production of CDRI began in late November 2018. HDRI production, commenced in February 2019.

Iron ore pellets for use in the DRI plant are transported from the port at Arzew via a 10-km conveyor. An insulated mechanical conveyor is used to transport HDRI, typically at 600° C, from the MIDREX® Shaft Furnace to the nearby melt-shop, thus improving energy efficiency.

UNDER CONSTRUCTION

AQS to Add 2.5 Million Tons of DRI in Algeria



Construction of a 2.5 million t/y MIDREX Combination DRI Plant for Algerian Qatari Steel (AQS) continued throughout 2018. The plant, located in Bellara, Algeria, 375 km east of Algiers, will provide HDRI and CDRI to a nearby EAF melt shop, which will produce 2.0 million t/y of rebar and wire rod. The MIDREX Plant will be capable of producing HDRI and CDRI simultaneously without halting operation.

AQS was founded in 2013 as a joint venture between Qatar Steel International (49%), Algerian investment group, SIDER (46%), and the National Investment Fund of Algeria (5%). The AQS DRI Plant is scheduled for start-up in late 2019.



NEW CAPACITY AND PLANTS UNDER CONSTRUCTION

Cliffs Moves Toward Completion of Great Lakes HBI Plant



Construction of a 1.6 million t/y MIDREX HBI Plant for Cleveland-Cliffs, Inc. continued in 2018. Cleveland-Cliffs announced plans to build the plant on a brownfield site at the Port of Toledo in June of 2017. The Toledo location was chosen due to its proximity to several future customers, as well as its logistics advantages including affordable gas availability and access by multiple rail carriers.

Groundbreaking for the plant was in April of 2018. It will provide a domestic source of HBI for electric arc furnace steel-makers in the Great Lakes region when it begins operation in summer 2020.

HYL/ENERGIRON

NEW CAPACITY

No new HYL/Energiron modules began operation in 2018.

UNDER CONSTRUCTION

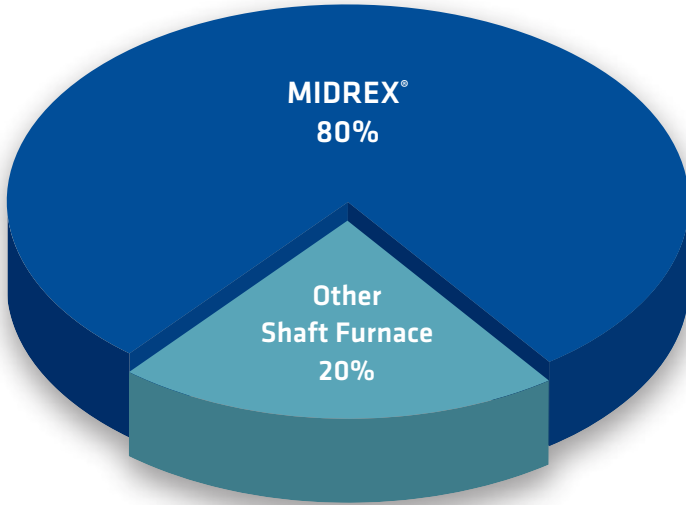
Tenova HYL/Energiron DRI Micro-Module Selected for Project in Bolivia

HYL/Energiron direct reduction technology will be used for the first stage of an iron & steel project for Empresa Siderúrgica del Mutún (ESM) at Puerto Suárez, Santa Cruz, Bolivia.

The 250,000 t/y Micro-Module DRI Plant is expected to be operational in mid-2021.



2018 World Shaft Furnace Production by Process



Total World Production: 100.5 Mt

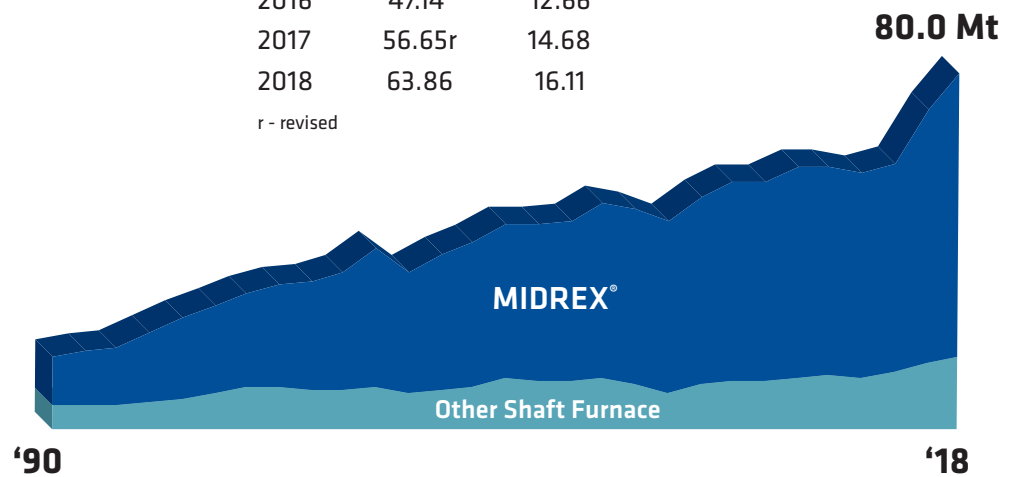
| | 2016 | 2017 | 2018 |
|----------------------------|-------|-------|-------|
| MIDREX® | 78.8% | 79.0% | 79.9% |
| Other Shaft Furnace | 21.2% | 21.0% | 20.1% |

Source: Midrex Technologies, Inc.

Shaft Furnace DRI Production by Process and by Year

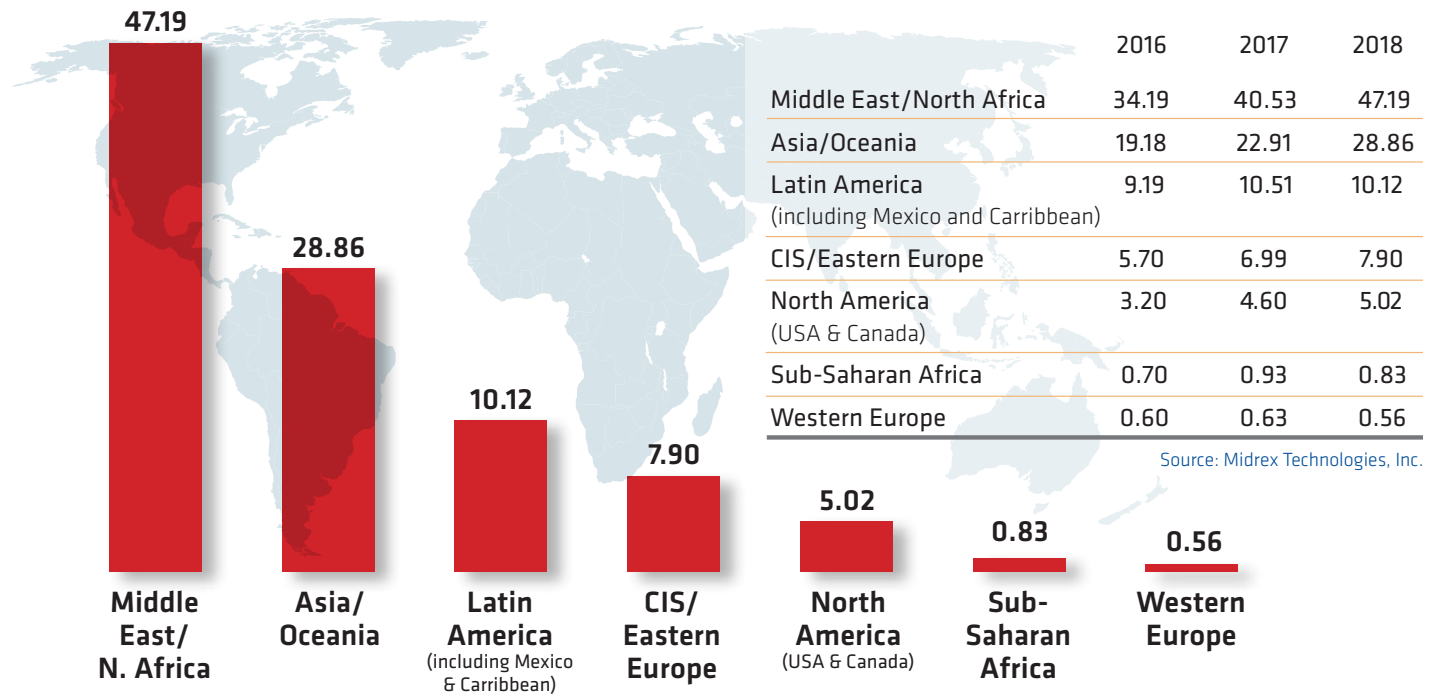
| Year | MIDREX® | Other Shaft Furnace | Year | MIDREX® | Other Shaft Furnace |
|------|---------|---------------------|------|---------|---------------------|
| 1990 | 10.73 | 5.25 | 2007 | 39.72 | 11.20 |
| 1991 | 11.96 | 5.40 | 2008 | 39.85 | 9.84 |
| 1992 | 13.26 | 5.29 | 2009 | 38.62 | 7.88 |
| 1993 | 15.91 | 5.73 | 2010 | 42.01 | 9.81 |
| 1994 | 17.83 | 7.01 | 2011 | 44.38 | 11.03 |
| 1995 | 19.86 | 8.15 | 2012 | 44.76 | 10.79 |
| 1996 | 21.03 | 9.12 | 2013 | 47.56 | 11.29 |
| 1997 | 23.08 | 9.55 | 2014 | 47.12 | 12.04 |
| 1998 | 24.82 | 8.52 | 2015 | 45.77 | 11.62 |
| 1999 | 26.12 | 8.81 | 2016 | 47.14 | 12.66 |
| 2000 | 30.12 | 9.39 | 2017 | 56.65r | 14.68 |
| 2001 | 26.99 | 8.04 | 2018 | 63.86 | 16.11 |
| 2002 | 30.11 | 8.88 | | | |
| 2003 | 32.06 | 9.72 | | | |
| 2004 | 35.01 | 11.34 | | | |
| 2005 | 34.96 | 11.00 | | | |
| 2006 | 35.71 | 10.91 | | | |

r - revised



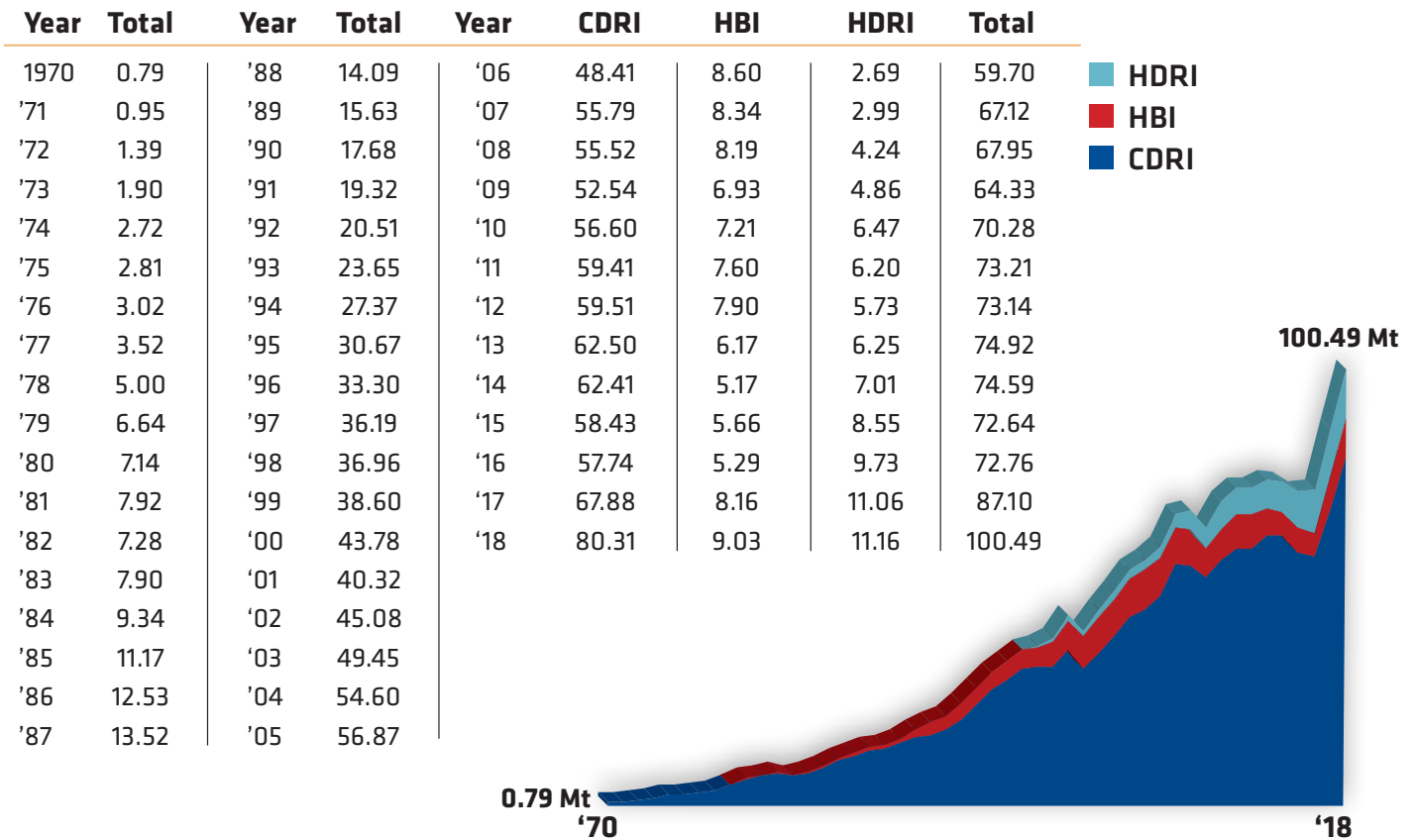


2018 World DRI Production by Region (Mt)



World DRI Production by Year (Mt)

Source: Midrex Technologies, Inc.





2018 World DRI Production by Region (Mt)

Source: Midrex Technologies, Inc.

| NAME | '70-'98 | '99 | '00 | '01 | '02 | '03 | '04 | '05 | '06 | '07 |
|------------------------------|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Latin America | | | | | | | | | | |
| ARGENTINA | 22.29 | 0.99 | 1.42 | 1.28 | 1.46 | 1.74 | 1.74 | 1.83 | 1.95 | 1.81 |
| BRAZIL | 6.68 | 0.40 | 0.42 | 0.43 | 0.36 | 0.41 | 0.44 | 0.43 | 0.38 | 0.36 |
| MEXICO | 59.99 | 6.24 | 5.83 | 3.67 | 4.90 | 5.62 | 6.54 | 5.98 | 6.17 | 6.26 |
| PERU | 0.86 | 0.05 | 0.08 | 0.07 | 0.03 | 0.08 | 0.08 | 0.09 | 0.14 | 0.09 |
| TRINIDAD & TOBAGO | 11.60 | 1.30 | 1.53 | 2.31 | 2.32 | 2.28 | 2.36 | 2.25 | 2.08 | 3.47 |
| VENEZUELA | 64.83 | 5.05 | 6.69 | 6.38 | 6.89 | 6.90 | 7.83 | 8.95 | 8.61 | 7.71 |
| Middle East/N. Africa | | | | | | | | | | |
| ALGERIA | - | - | - | - | - | - | - | - | - | - |
| BAHRAIN | - | - | - | - | - | - | - | - | - | - |
| EGYPT | 10.36 | 1.67 | 2.11 | 2.37 | 2.53 | 2.87 | 3.02 | 2.90 | 3.10 | 2.79 |
| IRAN | 21.51 | 4.12 | 4.74 | 5.00 | 5.28 | 5.62 | 6.41 | 6.85 | 6.85 | 7.44 |
| LIBYA | 7.81 | 1.33 | 1.50 | 1.09 | 1.17 | 1.34 | 1.58 | 1.65 | 1.63 | 1.64 |
| OMAN | - | - | - | - | - | - | - | - | - | - |
| QATAR | 10.56 | 0.67 | 0.62 | 0.73 | 0.75 | 0.78 | 0.83 | 0.82 | 0.88 | 1.30 |
| SAUDI ARABIA | 23.52 | 2.36 | 3.09 | 2.88 | 3.29 | 3.29 | 3.41 | 3.63 | 3.58 | 4.34 |
| UAE | - | - | - | - | - | - | - | - | - | - |
| Asia/Oceania | | | | | | | | | | |
| AUSTRALIA | - | 0.32 | 0.56 | 1.37 | 1.02 | 1.95 | 0.69 | - | - | - |
| CHINA | - | 0.11 | 0.05 | 0.11 | 0.22 | 0.31 | 0.43 | 0.41 | 0.41 | 0.60 |
| INDIA | 29.26r | 5.22 | 5.44 | 5.59 | 6.59 | 7.67 | 9.37 | 12.04 | 14.74 | 19.06 |
| INDONESIA | 22.82 | 1.74 | 1.82 | 1.48 | 1.50 | 1.23 | 1.47 | 1.27 | 1.20 | 1.32 |
| MALAYSIA | 11.56 | 0.96 | 1.26 | 1.12 | 1.08 | 1.60 | 1.68 | 1.38 | 1.54 | 1.84 |
| MYANMAR | 0.36 | 0.03 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | - | - | - |
| PAKISTAN | - | - | - | - | - | - | - | - | - | - |
| North America | | | | | | | | | | |
| CANADA | 18.69 | 0.92 | 1.13 | - | 0.18 | 0.50 | 1.09 | 0.59 | 0.45 | 0.91 |
| USA | 12.28 | 1.67 | 1.56 | 0.12 | 0.47 | 0.21 | 0.18 | 0.22 | 0.24 | 0.25 |
| CIS/Eastern Europe | | | | | | | | | | |
| RUSSIA | 20.80 | 1.88 | 1.92 | 2.51 | 2.91 | 2.91 | 3.14 | 3.34 | 3.28 | 3.41 |
| Sub-Saharan Africa | | | | | | | | | | |
| NIGERIA | 1.53 | - | - | - | - | - | - | - | - | 0.15 |
| SOUTH AFRICA | 13.32 | 1.16 | 1.53 | 1.56 | 1.55 | 1.54 | 1.63 | 1.78 | 1.75 | 1.74 |
| Western Europe | | | | | | | | | | |
| GERMANY | 8.13 | 0.40 | 0.46 | 0.21 | 0.54 | 0.59 | 0.61 | 0.44 | 0.58 | 0.59 |
| Other Nations | | | | | | | | | | |
| | 0.47 | - | - | - | - | - | - | - | - | - |
| WORLD TOTAL | 379.23 | 38.59 | 43.80 | 40.32 | 45.08 | 49.48 | 54.60 | 56.87 | 59.70 | 67.12 |

2018 World DRI Production by Process (Mt)

| NAME | '70-'98 | '99 | '00 | '01 | '02 | '03 | '04 | '05 | '06 | '07 |
|--------------------|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| MIDREX® | 229.92r | 26.12 | 30.16 | 27.03 | 30.10 | 32.11 | 35.01 | 34.96 | 35.71 | 39.72 |
| HYL/Energiron | 112.71 | 8.81 | 9.39 | 8.04 | 8.88 | 9.72 | 11.34 | 11.00 | 10.91 | 11.20 |
| Rotary Kiln | 28.36 | 2.94 | 3.14 | 3.18 | 4.43 | 5.04 | 6.41 | 9.17 | 11.53 | 14.90 |
| Other * | 8.24 | 0.73 | 1.11 | 2.07 | 1.67 | 2.61 | 1.66 | 1.70 | 1.53 | 1.29 |
| WORLD TOTAL | 379.23 | 38.59 | 43.80 | 40.32 | 45.08 | 49.48 | 54.60 | 56.87 | 59.70 | 67.12 |

* Other: A variety of processes using retorts, shaft furnaces, fluidized bed furnaces and hearths.

e - estimated

r - revised





2018 World DRI Production by Region (Mt)

Source: Midrex Technologies, Inc.

| NAME | '08 | '09 | '10 | '11 | '12 | '13 | '14 | '15 | '16 | '17 | '18 |
|------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|--------------|---------------|
| Latin America | | | | | | | | | | | |
| ARGENTINA | 1.86 | 0.81 | 1.57 | 1.68 | 1.61 | 1.54 | 1.67 | 1.26 | 0.78 | 1.23 | 1.61 |
| BRAZIL | 0.30 | 0.01 | - | - | - | - | - | - | - | - | - |
| MEXICO | 6.01 | 4.15 | 5.37 | 5.85 | 5.59 | 6.13 | 5.98 | 5.50 | 5.31 | 6.01 | 5.97e |
| PERU | 0.07 | 0.10 | 0.10 | 0.09 | 0.10 | 0.10 | 0.09 | 0.07 | 0.01 | - | - |
| TRINIDAD & TOBAGO | 2.78 | 1.99 | 3.08 | 3.03 | 3.25 | 3.29 | 3.24 | 2.52 | 1.50 | 1.59 | 1.54 |
| VENEZUELA | 6.87 | 5.61 | 3.79 | 4.47 | 4.61 | 2.77 | 1.68 | 2.75 | 1.59 | 1.68 | 0.99 |
| Middle East/N. Africa | | | | | | | | | | | |
| ALGERIA | - | - | - | - | - | - | - | - | - | - | 0.11 |
| BAHRAIN | - | - | - | - | - | 0.78 | 1.44 | 1.23 | 1.26 | 1.26 | 1.60 |
| EGYPT | 2.64 | 2.91 | 2.86 | 2.97 | 2.84 | 3.43 | 2.88 | 2.73 | 2.82 | 4.67 | 5.22e |
| IRAN | 7.46 | 8.20 | 9.35 | 10.37 | 11.58 | 14.46 | 14.55 | 14.55 | 16.01 | 20.55 | 25.75 |
| LIBYA | 1.57 | 1.11 | 1.27 | 0.30 | 0.51 | 0.95 | 1.00 | 0.45 | 0.69 | 0.56 | 0.61 |
| OMAN | - | - | - | 1.11 | 1.46 | 1.47 | 1.45 | 1.48 | 1.46 | 1.51 | 1.50 |
| QATAR | 1.68 | 2.10 | 2.16 | 2.23 | 2.42 | 2.39 | 2.64 | 2.71 | 2.58 | 2.63 | 2.63 |
| SAUDI ARABIA | 4.97 | 5.03 | 5.51 | 5.81 | 5.66 | 6.07 | 6.46 | 5.80 | 5.89 | 5.74 | 6.00 |
| UAE | - | - | 1.18 | 2.25 | 2.72 | 3.07 | 2.41 | 3.19 | 3.48 | 3.61 | 3.78 |
| Asia/Oceania | | | | | | | | | | | |
| AUSTRALIA | - | - | - | - | - | - | - | - | - | - | - |
| CHINA | 0.18 | 0.08 | - | - | - | - | - | - | - | - | - |
| INDIA | 21.20 | 22.03 | 23.42 | 21.97 | 20.05 | 17.77 | 17.31 | 17.68 | 18.47 | 22.34 | 28.11 |
| INDONESIA | 1.21 | 1.12 | 1.27 | 1.23 | 0.52 | 0.76 | 0.16r | 0.05 | -r | - | - |
| MALAYSIA | 1.94 | 2.30 | 2.39 | 2.16 | 2.01 | 1.40 | 1.33 | 0.96 | 0.66 | 0.57 | 0.75 |
| MYANMAR | - | - | - | - | - | - | - | - | - | - | - |
| PAKISTAN | - | - | - | - | - | 0.06 | - | - | - | - | - |
| North America | | | | | | | | | | | |
| CANADA | 0.69 | 0.34 | 0.60 | 0.70 | 0.84 | 1.25 | 1.55 | 1.50 | 1.40 | 1.61 | 1.67 |
| USA | 0.26 | - | - | - | - | - | 1.30 | 1.10 | 1.81 | 2.99 | 3.35 |
| CIS/Eastern Europe | | | | | | | | | | | |
| RUSSIA | 4.56 | 4.67 | 4.79 | 5.20 | 5.24 | 5.33 | 5.35 | 5.44 | 5.70 | 6.99 | 7.90e |
| Sub-Saharan Africa | | | | | | | | | | | |
| NIGERIA | 0.20 | - | - | - | - | - | - | - | - | - | - |
| SOUTH AFRICA | 1.18 | 1.39 | 1.12 | 1.41 | 1.57 | 1.41 | 1.55 | 1.12 | 0.70 | 0.93 | 0.83 |
| Western Europe | | | | | | | | | | | |
| GERMANY | 0.52 | 0.38 | 0.45 | 0.38 | .56 | 0.50 | 0.57 | 0.55 | 0.60 | 0.63 | 0.56 |
| Other Nations | | | | | | | | | | | |
| | - | - | - | - | - | - | - | - | - | - | - |
| WORLD TOTAL | 67.95 | 64.33 | 70.28 | 73.21 | 73.14 | 74.92 | 74.59 | 72.64 | 72.71r | 87.10 | 100.49 |

2018 World DRI Production by Process (Mt)

| NAME | '08 | '09 | '10 | '11 | '12 | '13 | '14 | '15 | '16 | '17 | '18 |
|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|--------------|---------------|
| MIDREX® | 39.85 | 38.62 | 42.01 | 44.38 | 44.76 | 47.56 | 47.12 | 45.77 | 47.14 | 56.65r | 63.86 |
| HYL/Energiron | 9.84 | 7.88 | 9.81 | 11.03 | 10.79 | 11.29 | 12.08 | 11.62 | 12.66 | 14.68 | 15.61e |
| Rotary Kiln | 16.92 | 17.33 | 18.12 | 17.32 | 17.06 | 15.93 | 15.39 | 14.74 | 12.67r | 15.34 | 20.31 |
| Other * | 1.33 | 0.76 | 0.34 | 0.48 | 0.53 | 0.14 | - | 0.51 | 0.24 | 0.44r | 0.72 |
| WORLD TOTAL | 67.95 | 64.33 | 70.28 | 73.21 | 73.14 | 74.92 | 74.59 | 72.64 | 72.71r | 87.10 | 100.49 |

* Other: A variety of processes using retorts, shaft furnaces, fluidized bed furnaces and hearths.

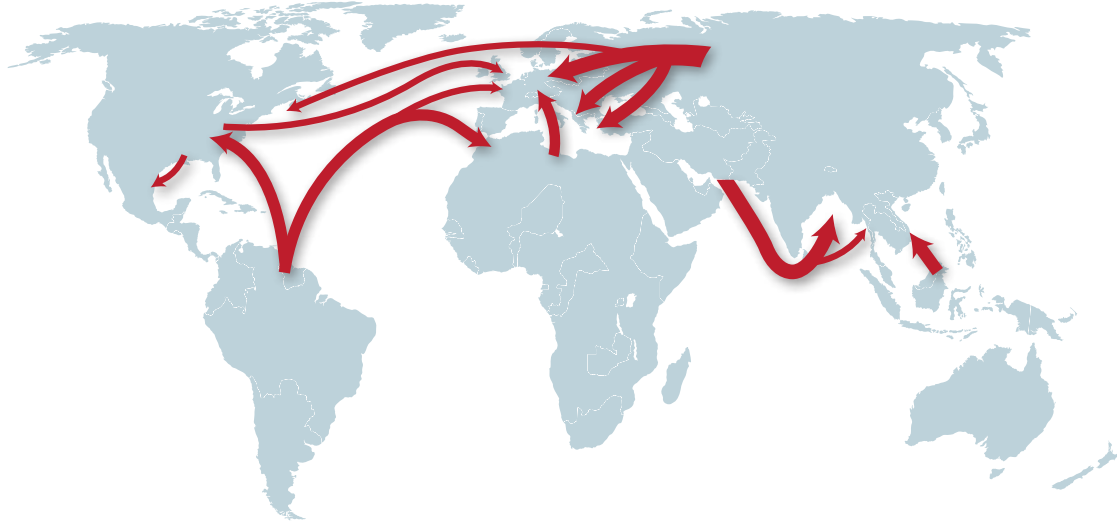
e - estimated

r - revised





Major Trade Routes for International Trade of DRI



The map shows the major routes of international transport of DRI in 2018. The width of the lines indicates the amount of DRI products that traveled over the individual routes. **NOTE: Domestic and smaller trade routes are not shown.**

SHIPMENTS WERE MUCH LARGER THAN IN ANY PREVIOUS YEAR AS THERE WAS A HUGE SURGE OF PRODUCTION AND DOMESTIC LAND SHIPMENT WITHIN INDIA DUE TO THE VERY PROFITABLE SITUATION FOR DRI. TOTAL SHIPMENTS WERE GREATER THAN 21 MILLION TONS.

SUPPLIERS

As in past years, Russia was the dominant exporter. It is believed 2018 total exports were approximately four million tons. Nearly all of this originated from the three large HBI plants at LGOK. Trinidad and Tobago exported about 1.5 million tons, all as CDRI bound for the United States. The USA and Bahrain each exported over 900,000 tons. Malaysia, Venezuela, India and Iran each exported between 600,000 and 800,000 tons. It should be noted that Iran's exports began to decline as governmental pressure was put on companies to use the iron domestically.

DESTINATIONS

ISSB data shows 48 nations that were importers of CDRI and HBI during 2018. Twenty of them purchased more than 100,000 tons. Italy imported the most, nearly 1.7 million tons and the USA was second with over 1.5 million tons. Much of the growth was seen in nations easily served from India and from the Gulf Region.

OUTLOOK

Lowered profitability caused by extraordinarily high iron ore costs are expected to limit international trade in 2019.

Data Source

Data for the map was taken from three sources: International Steel Statistics Bureau (ISSB), International Iron Metallics Association (IIMA), and reports from individual operating DR plants. Data from the ISSB originates with national export and import records; for instance, from the US Customs Bureau. IIMA information derives from a variety of sources. It should be stressed that a significant portion of the export data does not match the import data. Also, reports from individual plants show large tonnages for which the destination is unknown.

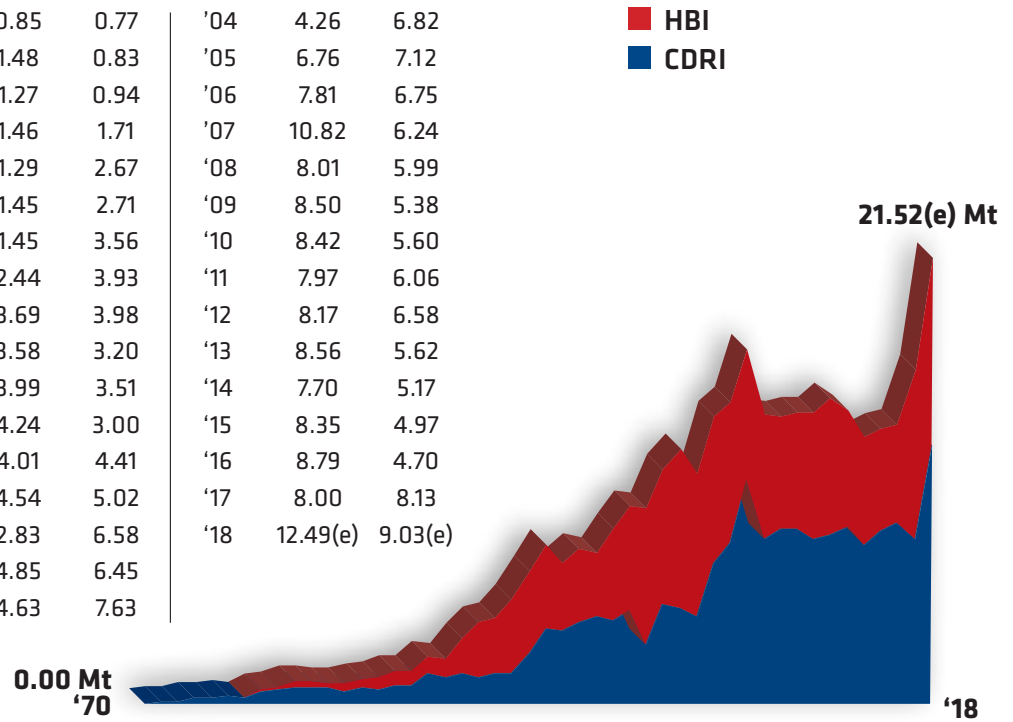
The arrows do not originate and terminate at specific countries. Rather, sums for dispatch and arrival were totaled by region and the arrows flow from region to region. For instance, the wide arrow originating from the north coast of South America shows DRI and HBI coming from the Caribbean (Venezuela plus Trinidad and Tobago) and being transported to North America and Europe.



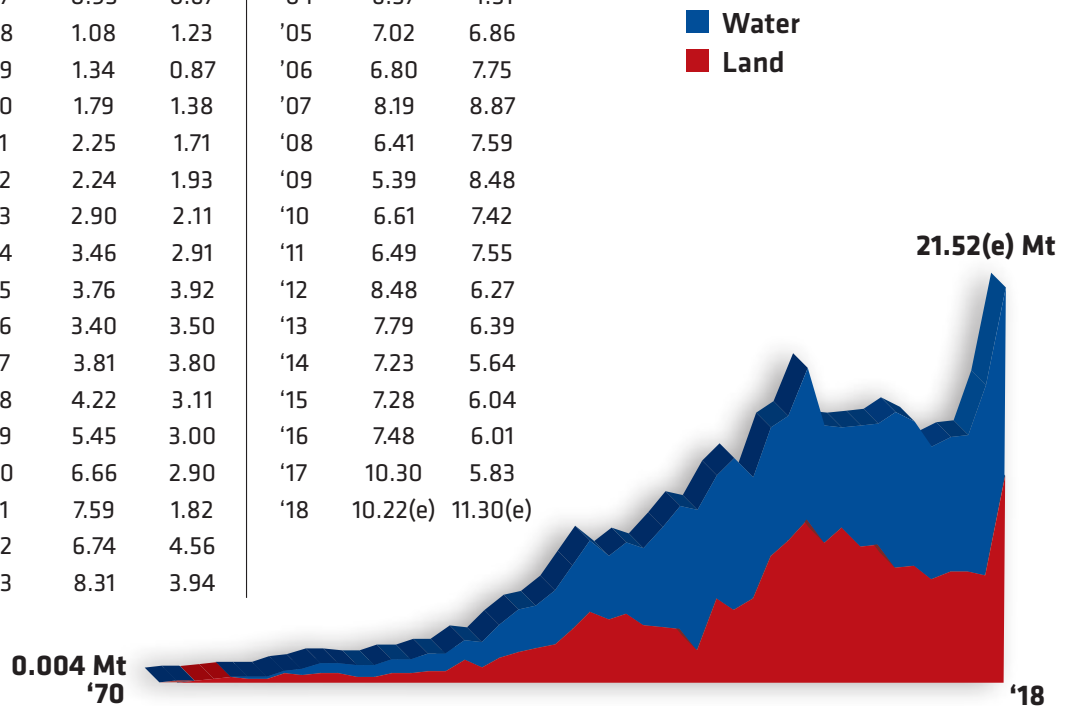
World DRI Shipments (Mt)

Source: Midrex Technologies, Inc.

| Year | CDRI | HBI | Year | CDRI | HBI | Year | CDRI | HBI |
|------|------|------|------|----------|---------|------|----------|---------|
| '70 | 0.00 | - | '77 | 0.32 | - | '04 | 4.26 | 6.82 |
| '71 | 0.04 | - | '78 | 0.28 | 0.11 | '05 | 6.76 | 7.12 |
| '72 | 0.08 | - | '79 | 0.66 | 0.12 | '06 | 7.81 | 6.75 |
| '73 | 0.13 | - | '80 | 0.81 | 0.25 | '07 | 10.82 | 6.24 |
| '74 | 0.26 | - | '81 | 0.83 | 0.25 | '08 | 8.01 | 5.99 |
| '75 | 0.34 | - | '82 | 0.80 | 0.18 | '09 | 8.50 | 5.38 |
| '76 | 0.37 | - | '83 | 0.59 | 0.36 | '10 | 8.42 | 5.60 |
| '77 | 0.32 | - | '84 | 0.83 | 0.39 | '11 | 7.97 | 6.06 |
| '78 | 0.28 | 0.11 | '85 | 0.71 | 0.61 | '12 | 8.17 | 6.58 |
| '79 | 0.66 | 0.12 | '86 | 0.89 | 0.73 | '13 | 8.56 | 5.62 |
| '80 | 0.81 | 0.25 | '03 | 4.63 | 7.63 | '14 | 7.70 | 5.17 |
| '81 | 0.83 | 0.25 | '04 | 4.26 | 6.82 | '15 | 8.35 | 4.97 |
| '82 | 0.80 | 0.18 | '05 | 6.76 | 7.12 | '16 | 8.79 | 4.70 |
| '83 | 0.59 | 0.36 | '06 | 7.81 | 6.75 | '17 | 8.00 | 8.13 |
| '84 | 0.83 | 0.39 | '07 | 10.82 | 6.24 | '18 | 12.49(e) | 9.03(e) |
| '85 | 0.71 | 0.61 | '08 | 8.01 | 5.99 | | | |
| '86 | 0.89 | 0.73 | '09 | 8.50 | 5.38 | | | |
| '87 | 0.85 | 0.77 | '10 | 8.42 | 5.60 | | | |
| '88 | 1.48 | 0.83 | '11 | 7.97 | 6.06 | | | |
| '89 | 1.27 | 0.94 | '12 | 8.17 | 6.58 | | | |
| '90 | 1.46 | 1.71 | '13 | 8.56 | 5.62 | | | |
| '91 | 1.29 | 2.67 | '14 | 7.70 | 5.17 | | | |
| '92 | 1.45 | 2.71 | '15 | 8.35 | 4.97 | | | |
| '93 | 1.45 | 3.56 | '16 | 8.79 | 4.70 | | | |
| '94 | 2.44 | 3.93 | '17 | 8.00 | 8.13 | | | |
| '95 | 3.69 | 3.98 | '18 | 12.49(e) | 9.03(e) | | | |
| '96 | 3.58 | 3.20 | | | | | | |
| '97 | 3.99 | 3.51 | | | | | | |
| '98 | 4.24 | 3.00 | | | | | | |
| '99 | 4.01 | 4.41 | | | | | | |
| '00 | 4.54 | 5.02 | | | | | | |
| '01 | 2.83 | 6.58 | | | | | | |
| '02 | 4.85 | 6.45 | | | | | | |



| Year | Water | Land | Year | Water | Land | Year | Water | Land |
|------|-------|-------|------|-------|------|------|----------|----------|
| '70 | - | 0.004 | '77 | 0.04 | 0.27 | '04 | 6.57 | 4.51 |
| '71 | - | 0.04 | '78 | 0.12 | 0.57 | '05 | 7.02 | 6.86 |
| '72 | 0.01 | 0.07 | '79 | 0.33 | 0.45 | '06 | 6.80 | 7.75 |
| '73 | 0.02 | 0.12 | '80 | 0.54 | 0.52 | '07 | 8.19 | 8.87 |
| '74 | 0.03 | 0.23 | '81 | 0.53 | 0.55 | '08 | 6.41 | 7.59 |
| '75 | 0.06 | 0.28 | '82 | 0.65 | 0.33 | '09 | 5.39 | 8.48 |
| '76 | 0.10 | 0.26 | '83 | 0.67 | 0.28 | '10 | 6.61 | 7.42 |
| '77 | 0.04 | 0.27 | '84 | 0.69 | 0.53 | '11 | 6.49 | 7.55 |
| '78 | 0.12 | 0.57 | '85 | 0.81 | 0.51 | '12 | 8.48 | 6.27 |
| '79 | 0.33 | 0.45 | '86 | 0.99 | 0.63 | '13 | 7.79 | 6.39 |
| '80 | 0.54 | 0.52 | '03 | 8.31 | 3.94 | '14 | 7.23 | 5.64 |
| '81 | 0.53 | 0.55 | '04 | 0.95 | 0.67 | '15 | 7.28 | 6.04 |
| '82 | 0.65 | 0.33 | '05 | 1.08 | 1.23 | '16 | 7.48 | 6.01 |
| '83 | 0.67 | 0.28 | '06 | 1.34 | 0.87 | '17 | 10.30 | 5.83 |
| '84 | 0.69 | 0.53 | '07 | 1.79 | 1.38 | '18 | 10.22(e) | 11.30(e) |
| '85 | 0.81 | 0.51 | '08 | 2.25 | 1.71 | | | |
| '86 | 0.99 | 0.63 | '09 | 2.24 | 1.93 | | | |
| '87 | 0.95 | 0.67 | '10 | 2.90 | 2.11 | | | |
| '88 | 1.08 | 1.23 | '11 | 3.46 | 2.91 | | | |
| '89 | 1.34 | 0.87 | '12 | 3.76 | 3.92 | | | |
| '90 | 1.79 | 1.38 | '13 | 3.40 | 3.50 | | | |
| '91 | 2.25 | 1.71 | '14 | 3.81 | 3.80 | | | |
| '92 | 2.24 | 1.93 | '15 | 4.22 | 3.11 | | | |
| '93 | 2.90 | 2.11 | '16 | 5.45 | 3.00 | | | |
| '94 | 3.46 | 2.91 | '17 | 6.66 | 2.90 | | | |
| '95 | 3.76 | 3.92 | '18 | 7.59 | 1.82 | | | |
| '96 | 3.40 | 3.50 | | 6.74 | 4.56 | | | |
| '97 | 3.81 | 3.80 | | 8.31 | 3.94 | | | |
| '98 | 4.22 | 3.11 | | | | | | |
| '99 | 5.45 | 3.00 | | | | | | |
| '00 | 6.66 | 2.90 | | | | | | |
| '01 | 7.59 | 1.82 | | | | | | |
| '02 | 6.74 | 4.56 | | | | | | |



Note regarding land shipments: It is estimated that about 30% of the DRI produced in India is transported domestically to nearby melting furnaces. This tonnage is included in the figures given above.





World Direct Reduction Plants

Status as of 6/30/19 Source: Midrex Technologies, Inc.

| Plant | Location | Capacity (Mt/y) | Modules | Product | Start-up | Status* |
|----------------------------------|--------------------------------|-----------------|---------|-----------|-----------------|---------|
| MIDREX® | | | | | | |
| ArcelorMittal Hamburg | Hamburg, Germany | 0.40 | 1 | CDRI | '71 | 0 |
| ArcelorMittal Canada 1 | Contrecoeur, Quebec, Canada | 0.40 | 1 | CDRI | '73 | 0 |
| Tenaris Siderca | Campana, Argentina | 0.40 | 1 | CDRI | '76 | 0 |
| ArcelorMittal Canada 2 | Contrecoeur, Quebec, Canada | 0.60 | 1 | CDRI | '77 | 0 |
| SIDOR I | Matanzas, Venezuela | 0.35 | 1 | CDRI | '77 | 0 |
| Acindar | Villa Constitucion, Argentina | 0.60 | 1 | CDRI | '78 | 0 |
| Qatar Steel 1 | Mesaieed, Qatar | 0.40 | 1 | CDRI | '78 | 0 |
| SIDOR II | Matanzas, Venezuela | 1.29 | 3 | CDRI | '79 | 0 I |
| ArcelorMittal Point Lisas I & II | Point Lisas, Trinidad & Tobago | 0.84 | 2 | CDRI | '80/'82 | I |
| Delta Steel | Warri, Nigeria | 1.02 | 2 | CDRI | '82 | I |
| Hadeed A & B | Al-Jubail, Saudi Arabia | 0.80 | 2 | CDRI | '82/'83 | 0 |
| OEMK I - IV | Stary Oskol, Russia | 1.67 | 4 | CDRI | '83/'85/'85/'87 | 0 |
| Antara Steel Mills | Labuan Island, Malaysia | 0.65 | 1 | HBI | '84 | 0 |
| Khouzestan Steel Co. I - III | Ahwaz, Iran | 2.05 | 3 | CDRI | '89/'90/'92 | 0 |
| EZDK I | El Dikheila, Egypt | 0.72 | 1 | CDRI | '86 | 0 |
| LISCO 1 & 2 | Misurata, Libya | 1.10 | 2 | CDRI | '89/'90 | 0 |
| Essar Steel I & II | Hazira, India | 0.88 | 2 | HBI/HDRI | '90 | 0 |
| FMO | Puerto Ordaz, Venezuela | 1.00 | 1 | HBI | '90 | 0 |
| Venprecar | Matanzas, Venezuela | 0.82 | 1 | HBI | '90 | 0 |
| Essar Steel III | Hazira, India | 0.44 | 1 | HBI/HDRI | '92 | 0 |
| Hadeed C | Al-Jubail, Saudi Arabia | 0.65 | 1 | CDRI | '92 | 0 |
| Mobarakeh Steel A - E | Mobarakeh, Iran | 4.0 | 5 | CDRI | '92/'93/'94 | 0 |
| JSW Dolvi Works | Raigad, India | 1.00 | 1 | CDRI | '94 | 0 |
| EZDK II | El Dikheila, Egypt | 0.80 | 1 | CDRI | '97 | 0 |
| LISCO 3 | Misurata, Libya | 0.65 | 1 | HBI | '97 | 0 |
| ArcelorMittal Lázaro Cárdenas | Lázaro Cárdenas, Mexico | 1.20 | 1 | CDRI | '97 | 0 |
| COMSIGUA | Matanzas, Venezuela | 1.00 | 1 | HBI | '98 | 0 |
| ArcelorMittal Point Lisas III | Point Lisas, Trinidad & Tobago | 1.36 | 1 | CDRI | '99 | I |
| ArcelorMittal South Africa | Saldanha Bay, South Africa | 0.80 | 1 | CDRI | '99 | 0 |
| EZDK III | El Dikheila, Egypt | 0.80 | 1 | CDRI | '00 | 0 |
| Khouzestan Steel IV | Ahwaz, Iran | 0.85 | 1 | CDRI | '01 | 0 |
| Essar Steel IV | Hazira, India | 1.00 | 1 | HBI/HDRI | '04 | 0 |
| Nu-Iron | Point Lisas, Trinidad & Tobago | 1.60 | 1 | CDRI | '06 | 0 |
| Essar Steel V | Hazira, India | 1.50 | 1 | HBI/HDRI | '06 | 0 |
| Mobarakeh Steel F | Mobarakeh, Iran | 0.85 | 1 | CDRI | '06 | 0 |
| DRIC I & II | Dammam, Saudi Arabia | 1.00 | 2 | CDRI | '07 | 0 |
| Hadeed E | Al-Jubail, Saudi Arabia | 1.76 | 1 | HDRI/CDRI | '07 | 0 |
| LGOK HBI-2 | Gubkin, Russia | 1.40 | 1 | HBI | '07 | 0 |
| Qatar Steel 2 | Mesaieed, Qatar | 1.50 | 1 | CDRI/HBI | '07 | 0 |
| Khouzestan Steel V | Ahwaz, Iran | 0.92 | 1 | CDRI | '08 | 0 |
| Lion DRI | Banting, Malaysia | 1.54 | 1 | HDRI/HBI | '08 | I |
| HOSCO A & B | Bandar Abbas, Iran | 1.66 | 2 | CDRI | '09/'10 | 0 |
| Essar Steel VI | Hazira, India | 1.50 | 1 | CDRI | '10 | 0 |
| Khorasan Steel I | Khorasan (Mashad), Iran | 0.80 | 1 | CDRI | '10 | 0 |
| JindalShadeed | Sohar, Oman | 1.50 | 1 | HDRI/HBI | '11 | 0 |

(Continued next page)

Note 1: This list does not include plants that are inoperable or that have been dismantled.

Note 2: This list only includes plants processing feed materials with total iron content of 60% or higher and producing DRI with metallization of 85% or higher.

Note 3: There are nearly 300 small rotary kilns in India with annual capacities of 10,000-30,000 tons per year that are not included on this list.

Note 4: Only a representative sample of rotary kiln facilities larger than 50,000 tons per year are shown.

* Status Codes: 0 – Operating I – Idle C – Under Contract or Construction





World Direct Reduction Plants

Status as of 6/30/19 Source: Midrex Technologies, Inc.

| Plant | Location | Capacity (Mt/y) | Modules | Product | Start-up | Status* |
|----------------------------------|------------------------------------|-----------------|---------|-----------|----------|---------|
| MIDREX® (Continued) | | | | | | |
| IGISCO | Ardakan (Yazd), Iran | 0.80 | 1 | CDRI | '12 | O |
| Khorasan Steel II | Khorasan, Iran | 0.80 | 1 | CDRI | '12 | O |
| South Kaveh Steel | Bandar Abbas, Iran | 1.86 | 2 | CDRI | '12/'13 | O |
| Mobarakeh Steel (Kharazi A & B) | Esfahan, Iran | 2.76 | 2 | CDRI | '12/'14 | O |
| Tuwairqi Steel Mills | Karachi, Pakistan | 1.28 | 1 | HDRI/CDRI | '13 | I |
| SULB | Hidd, Bahrain | 1.50 | 1 | HDRI/CDRI | '13 | O |
| Arfa Steel | Ardakan (Yazd), Iran | 0.80 | 1 | CDRI | '13 | O |
| Mobarakeh Steel (Saba) | Esfahan, Iran | 1.38 | 1 | CDRI | '13 | O |
| JSW Projects Ltd. | Toranagallu, Karnataka, India | 1.20 | 1 | HDRI/CDRI | '14 | O |
| Sirjan Iranian Co. | Kerman, Iran | 0.8 | 1 | CDRI | '14 | O |
| ESISCO | Sadat City, Egypt | 1.76 | 1 | HDRI/CDRI | '15 | I |
| Jindal Steel & Power | Angul, India | 1.80 | 1 | HDRI/CDRI | '15 | O |
| Sirjan Jahan Steel | Kerman, Iran | 0.96 | 1 | CDRI | '15 | O |
| Gol-e-Gohar | Kerman, Iran | 1.56 | 1 | CDRI | '15 | O |
| voestalpine Texas | Corpus Christi, Texas, USA | 2.00 | 1 | HBI | '16 | O |
| Sepiddasht | Char Mahal and Bakhtiari, Iran | 0.80 | 1 | CDRI | '16 | O |
| LGOK HBI-3 | Gubkin, Russia | 1.80 | 1 | HBI | '17 | O |
| Persian Gulf Saba | Bandar Abbas, Iran | 1.50 | 1 | HBI | '18 | O |
| Sabzevar | Khorasan Razavi, Iran | 0.80 | 1 | CDRI | '18 | O |
| Gol-e-Gohar II | Kerman, Iran | 1.70 | 1 | CDRI | '18 | O |
| Tosyali Algeria | Oran, Algeria | 2.50 | 1 | HDRI/CDRI | '18 | O |
| Chador Malu | Ardakan (Yazd), Iran | 1.55 | 1 | HDRI/CDRI | '18 | O |
| Sirjan Iranian Co. 2 | Kerman, Iran | 0.90 | 1 | CDRI | '18 | O |
| Qaenat | South Khorasan, Iran | 0.80 | 1 | CDRI | '19 | C |
| Algerian Qatar Steel | Bellara, Algeria | 2.50 | 1 | HDRI/CDRI | '19 | C |
| Pasargad Steel | Shiraz, Fars, Iran | 1.50 | 1 | HDRI/CDRI | '19 | C |
| Cleveland-Cliffs | Toledo, Ohio, USA | 1.60 | 1 | HBI | '20 | C |
| Ardakan Steel | Ardakan (Yazd), Iran | 0.96 | 1 | CDRI | '20 | C |
| Makran | Chabahar, Sistan-Baluchestan, Iran | 1.60 | 1 | HBI | '21 | C |
| Torbat | Khorasan, Iran | 1.85 | 1 | CDRI | '22 | C |
| Saqquez | Saqquez, Kurdistan, Iran | 1.00 | 1 | HBI | '22 | C |
| | | 92.69 | 96 | | | |
| HYL/ENERGIRON | | | | | | |
| Ternium 3M5 | Monterrey, Mexico | 0.50 | 1 | CDRI | '83 | O |
| ArcelorMittal Lázaro Cárdenas I | Lázaro Cárdenas, Mexico | 1.00 | 2 | CDRI | '88 | O |
| ArcelorMittal Lázaro Cárdenas II | Lázaro Cárdenas, Mexico | 1.00 | 2 | CDRI | '91 | O |
| JSW Salav** | Raigad, India | 0.90 | 1 | HBI/CDRI | '93 | O |
| PT Krakatau Steel | Cilegon, Indonesia | 1.35 | 2 | CDRI | '93 | I |
| Perwaja Steel | Kemaman, Malaysia | 1.20 | 2 | CDRI | '93 | I |
| Usiba | Salvador Bahia, Brazil | 0.31 | 1 | CDRI | '94 | I |
| Ternium 2P5 | Puebla, Mexico | 0.61 | 1 | CDRI | '95 | O |
| Ternium 4M | Monterrey, Mexico | 0.68 | 1 | HDRI | '98 | O |
| LGOK HBI-1 | Gubkin, Russia | 0.90 | 1 | HBI | '99 | O |
| Hadeed D | Al-Jubail, Saudi Arabia | 1.10 | 1 | CDRI | '99 | O |
| Briqven | Matanzas, Venezuela | 1.50 | 2 | HBI | '00 | O |

** JSW Salav has two reduction furnaces but only one reformer. The reformer can supply either reduction furnace, but not simultaneously.

Note 1: This list does not include plants that are inoperable or that have been dismantled.

Note 2: This list only includes plants processing feed materials with total iron content of 60% or higher and producing DRI with metallization of 85% or higher.

Note 3: There are nearly 300 small rotary kilns in India with annual capacities of 10,000-30,000 tons per year that are not included on this list.

Note 4: Only a representative sample of rotary kiln facilities larger than 50,000 tons per year are shown.

* Status Codes: O – Operating I – Idle C– Under Contract or Construction





World Direct Reduction Plants

Status as of 6/30/19 Source: Midrex Technologies, Inc.

| Plant | Location | Capacity (Mt/y) | Modules | Product | Start-up | Status* |
|----------------------------------|--------------------------------|-----------------|---------|-----------|---------------------|---------|
| HYL/ENERGIRON (Continued) | | | | | | |
| Gulf Sponge Iron | Abu Dhabi, UAE | 0.20 | 1 | CDRI | '10 | O |
| Emirates Steel II (GHC) | Abu Dhabi, UAE | 2.00 | 1 | HDRI | '11 | O |
| Suez Steel | Adabia, Egypt | 1.95 | 1 | HDRI/CDRI | '13 | O |
| Nucor Steel Louisiana | Convent, Louisiana, USA | 2.50 | 1 | CDRI | '13 | O |
| Ezz Rolling Mills | Ain Sukhna, Egypt | 1.90 | 1 | CDRI | '15 | O |
| Sidor | Matanzas, Venezuela | 0.80 | 1 | CDRI | '20 | C |
| Mutun Steel | Puerto Suarez, SC, Bolivia | 0.25 | 1 | CDRI | '21 | C |
| | | 22.65 | 25 | | | |
| OTHER | | | | | | |
| FINMET | | | | | | |
| BriqOri | Matanzas, Venezuela | 2.20 | 4 | HBI | '00 | O |
| CIRCORED | | | | | | |
| Arcelor Mittal Trinidad | Point Lisas, Trinidad & Tobago | 0.50 | 1 | HBI | '99 | I |
| FIOR | | | | | | |
| Operaciones RDI | Matanzas, Venezuela | 0.40 | 1 | HBI | '76 | I |
| PERED | | | | | | |
| Shadegan Steel | Shadegan, Khouzestan, Iran | 0.80 | 1 | CDRI | '17 | O |
| Mianeh Steel | Mianeh, East Azerbaijan, Iran | 0.80 | 1 | CDRI | '17 | O |
| Neyriz Steel | Neyriz, Fars, Iran | 0.80 | 1 | CDRI | '18 | O |
| Baft Steel | Baft, Kerman, Iran | 0.80 | 1 | CDRI | '19 | O |
| | | 3.20 | 4 | | | |
| ROTARY KILN | | | | | | |
| SL/RN | | | | | | |
| Piratini | Charquedas, Brazil | 0.06 | 1 | CDRI | '73 | I |
| SIIL | Paloncha, India | 0.06 | 2 | CDRI | '80/'85 | O |
| Siderperu | Chimbote, Peru | 0.10 | 3 | CDRI | '80 | I |
| ISCOR | Vanderbijlpark, South Africa | 0.72 | 4 | CDRI | '84 | O |
| Prakash Industries | Champa, India | 0.40 | 2 | CDRI | '93/'96 | O |
| Nova Iron & Steel | Bilaspur, India | 0.15 | 1 | CDRI | '94 | O |
| Ashirwad | Jamshedpur, India | 0.05 | 2 | CDRI | '00 | O |
| Vandana Global | Siltara, Raigarh, India | 0.05 | 1 | CDRI | | O |
| Prakash Industry | Champa, India | 0.60 | | CDRI | | O |
| JINDAL | | | | | | |
| Jindal Steel & Power | Raigarh, India | 0.90 | 6 | CDRI | '93/'94/'95/'96/'00 | O |
| Monnet Ispat | Raipur, India | 0.30 | 2 | CDRI | '93/'98 | O |
| Rexon Strips Ltd. | Via Lathikata, India | 0.06 | 2 | CDRI | '93/'00 | O |
| DRC | | | | | | |
| Scaw Metals I | Germiston, South Africa | 0.18 | 2 | CDRI | '83/'89 | O |
| Scaw Metals II | Germiston, South Africa | 0.15 | 1 | CDRI | '97 | O |
| Tianjin Iron & Steel | Tianjin, China | 0.30 | 2 | CDRI | '97 | I |

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* Status Codes: O – Operating I – Idle C – Under Contract or Construction



World Direct Reduction Plants

Status as of 6/30/19 Source: Midrex Technologies, Inc.

| Plant | Location | Capacity (Mt/y) | Modules | Product | Start-up | Status* |
|---------------------------------|------------------------------------|-----------------|---------|---------|----------|---------|
| ROTARY KILN (Continued) | | | | | | |
| CODIR | | | | | | |
| Dunswart | Benoni, South Africa | 0.15 | 1 | CDRI | '73 | 0 |
| Sunflag | Bhandara, India | 0.15 | 1 | CDRI | '89 | 0 |
| TISCO | | | | | | |
| Tata Sponge Iron, Ltd. | Keonjhar, Orissa, India | 0.40 | 2 | CDRI | '86/'98 | 0 |
| Vallabh Steels | Ludhiana, Punjab, India | 0.12 | 1 | CDRI | | 0 |
| SIIL | | | | | | |
| Bellary Steel & Alloys | Bellary, Karnataka, India | 0.06 | 2 | CDRI | '92/'93 | 0 |
| HEG | Borai, India | 0.09 | 2 | CDRI | '92 | 0 |
| Kumar Met. | Nalgonda, India | 0.06 | 2 | CDRI | '93 | 0 |
| Aceros Arequipa | Pisco, Peru | 0.08 | 2 | CDRI | '96 | 0 |
| Rungta Mines | Barbil, India | | | | | |
| OSIL | | | | | | |
| OSIL | Keonjhar, Orissa, India | 0.10 | 1 | CDRI | '83 | 0 |
| Lloyd's Metals & Eng. | Ghugus, India | 0.27 | | CDRI | '95 | 0 |
| DAV | | | | | | |
| Davsteel | Cullinan, South Africa | 0.04 | 1 | CDRI | '85 | 0 |
| BGRIMM | | | | | | |
| ArcelorMittal South Africa | Vanderbijlpark, South Africa | 0.30 | 2 | CDRI | '09 | 0 |
| OTHER | | | | | | |
| Mahalaxmi TMT Bars | Wardha, Maharashtra India | 0.24 | 1 | CDRI | '11 | 0 |
| BMM Ispat Ltd | Danapura, Hospet, Karnataka, India | 0.73 | | CDRI | | 0 |
| Sarda Energy and Minerals, Ltd. | Siltara, Raipur, India | 0.36 | | CDRI | | 0 |
| Godawari Power and Ispat | Siltara, Raipur, India | 0.5 | | CDRI | | 0 |
| Nalwa Steel and Power Ltd. | Raigarh, Chhattisgarh, India | 0.18 | | CDRI | | 0 |
| Janki Corp., Ltd. | Sidiginamola, Bellary, Karnataka | 0.18 | | CDRI | | 0 |
| Andhunik Metaliks, Ltd. | Chadrihariharpur, Orissa, India | 0.3 | | CDRI | | 0 |
| Shyam SEL Ltd. | West Bengal and Odisha, India | 0.8 | | CDRI | | 0 |
| Shri Bajrang Power and Ispat | Raipur, India | 0.36 | | CDRI | | 0 |
| Gallantt Metal, Ltd. | Kutch, Gujarat, India | 0.2 | | CDRI | | 0 |
| SKS Ispat, Ltd. | Raipur, Chhattisgarh, India | 0.27 | | CDRI | | 0 |
| Bhushan Power and Steel Ltd. | Sambalpur, Odisha, India | 1.5 | | CDRI | 11-'12 | 0 |
| Bhushan Steel Ltd. | Angul, Odisha, India | 1.5 | | CDRI | | 0 |
| Electrotherm (India) Ltd. | Kutch, Gujarat, India | 0.15 | | CDRI | | 0 |
| Jayaswal Neco Industries Ltd. | Raipur, Chhattisgarh | 0.25 | | CDRI | | 0 |
| SMC Power Generation Ltd. | Jharsuguda, Odisha, India | 0.2 | | CDRI | | 0 |
| Electrotherm | Kutch, India | 0.18 | | CDRI | | 0 |
| PT Meratus Jaya | Kalimantan Selatan, Indonesia | 0.32 | | CDRI | | 0 |

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2018 WORLD DIRECT REDUCTION STATISTICS is compiled by Midrex Technologies, Inc. annually as a resource for the global iron and steel industry.

Direct reduced iron (DRI) is a high quality metallic product produced from iron ore that is used as a feedstock in electric arc furnaces, blast furnaces and other iron and steelmaking applications. Hot briquetted iron (HBI) is a compacted form of DRI designed for ease of shipping, handling, and storage.

Midrex Technologies, Inc. is the world leader for direct reduction ironmaking technology and aftermarket solutions for the steel industry. As the technology provider of the MIDREX® Process for 50+ years, Midrex designs Direct Reduced Iron (DRI) plants, providing engineering, proprietary equipment, and project development services. The MIDREX® Process is unsurpassed in the industry in terms of production and process flexibility to meet the constantly evolving nature of steelmakers and ore-based metallics providers.

The following organizations supplied or assisted in collecting data for this issue of 2018 WORLD DIRECT REDUCTION STATISTICS:

Sponge Iron Manufacturers Association – India
World Steel Association – Belgium
International Iron Metallics Association – UK
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World Steel Dynamics (WSD) has audited Midrex's collection and preparation process of the "2018 World Direct Reduction Statistics", i.e. "The Booklet". It is our observation that at the present, Midrex receives inputs from all over the world from practically every known direct reduction producer either directly or indirectly through partner organizations. Midrex invites all producers to participate directly. In instances where plant information is not available directly from producers, Midrex deduces that information from publicly available data. WSD has reviewed the data collection and preparation procedures and can confirm the documentation substantiates the methodology and accuracy of the data to be published in The Booklet for the world direct reduction industry in 2018.

Audited by



Englewood Cliffs,
 New Jersey, U.S.A.
 July, 2019

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