



# 2009

**WORLD**

**DIRECT REDUCTION  
STATISTICS**

# MIDREX

[www.midrex.com](http://www.midrex.com)

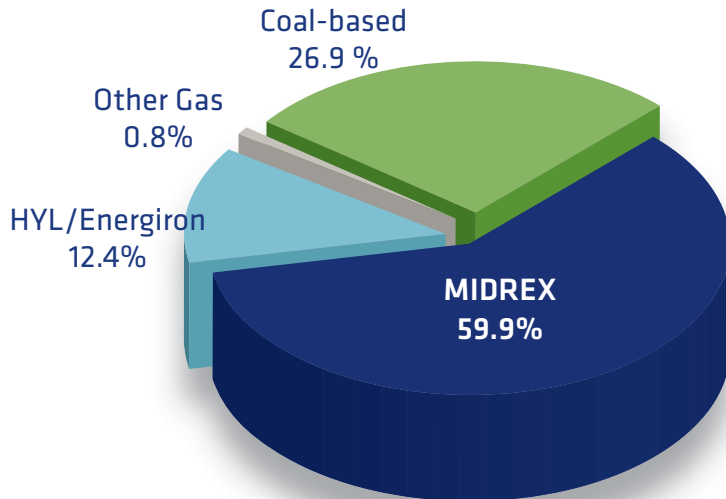


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## 2009 World DRI Production by Process



### Total World Production: 64.4 Mt

	2008	2009
MIDREX	58.6%	59.9%
HYL/Energiron	14.6%	12.4%
Other Gas	1.6%	0.8%
Coal-based	25.3%	26.9%

Source: Midrex Technologies, Inc.



### DRI production declines in 2009, but recovers rapidly

Total DRI production in 2009 tallied 64.4 million tons, not a record, but truly amazing in light of economic conditions. Difficult economic conditions caused a large share of the world's DR capacity to be shuttered. Of the 58 MIDREX® Modules installed at the beginning of 2009, 54 remained in operation but four were idled, two in Nigeria, one in Canada and one in Trinidad. And, of the 26 installed HyL/Energiron Modules, 16 remained in operation while 10 were idled, three in Iran, two in Indonesia, two in Mexico, two in Venezuela and one in India. Beginning the year reeling from

the effects of the world financial crisis, the direct reduction industry made a remarkably rapid recovery in 2009. Starting in January, with approximately one-fourth of capacity going unused, world direct reduced iron output gradually increased throughout the year so that by December it was back up to 96% of the alltime maximum monthly production rate. This contrasted sharply with the non-Chinese world's blast furnace ironmaking industry, which fell to below 60% of capacity at the beginning of the year and had only returned to 85% by December.

Particular strength was exhibited in the CIS, in the Middle East and in South Asia where a number of nations with significant histories of DRI production broke the records of their prior best years; namely, Russia, Iran, Qatar, Saudi Arabia and India. Peru and the United Arab Emirates also set new records but each of these produces less than one million tons per year. Contrasting with the growth mentioned above, the crisis combined with other factors caused output by some nations to shrink, notably Mexico and Venezuela, each of which made less than two-thirds of its previous maximum.

India, once again, led all nations in DRI production with over 22 million tons, more than one-third of the world total. Of this, 16.2 million tons were made in rotary kilns. The rotary kiln, coal-based method for direct reduction again set records. There are approximately 350 of these furnaces operating



within India. Iran was the second largest producer of direct reduced iron, accounting for 8.2 million tons. Iran led the world in natural gas-based DRI production, and Venezuela and Saudi Arabia each also produced in excess of five million tons, with Venezuela making 5.6 million tons, and Saudi Arabia making 5.0 million tons. Russia was close behind with 4.7 million tons. Rounding out the top ten were Mexico, Egypt, Malaysia, Qatar and Trinidad with 4.1 million, 2.9 million, 2.3 million, 2.1 million and 2.0 million tons respectively.

**FORCES AFFECTING THE INDUSTRY**

Unquestionably, the major force on the DR industry was the world financial crisis carrying over from 2008. The downturn, especially in the more developed economies, was more severe than anything experienced since the Great Depression of the 1930's. But the recovery was genuinely heartening, in that it came somewhat more rapidly and certainly more powerfully than expected.

There were factors in addition to the financial downturn that contributed to the DRI production drop. Most noticeably, in Venezuela, shortages of iron oxide pellets and electricity forced curtailment of iron production.

By the time of this writing (late April 2010) the DR industry appears to have essentially returned to normal operation.

**NEW CAPACITY AND PLANTS UNDER CONSTRUCTION**

**MIDREX**

• **New module begins operation**

The first module at HOSCO in Bandar Abbas, Iran began operation.

• **Under Construction**

MIDREX® Plants are under construction at Tuwairqi Steel Mills in Pakistan, Essar Steel in India, Shadeed in Oman, ESISCO in Egypt and Jindal Steel and Power in India. A number of plants are under construction in Iran. Also, not shown in the listing of World Direct Reduction Plants at the end of this document (because it was not yet contracted by December 31, 2009) a new plant has been contracted for SULB in Bahrain.

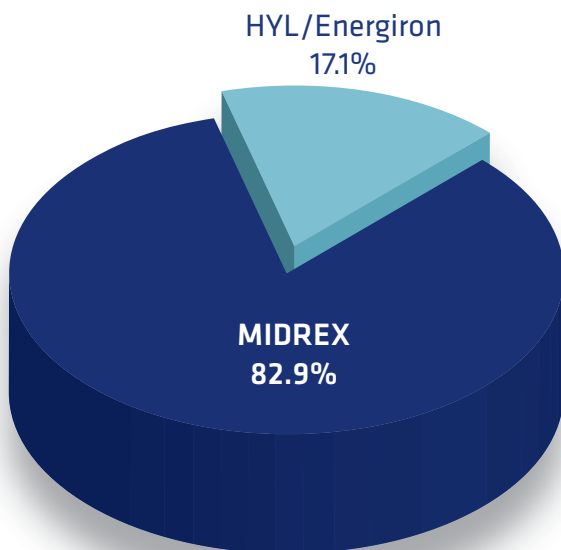
**HYL/Energiron**

• One module began operation at Emirates Steel in Abu Dhabi, where a second module is under construction. Also in Abu Dhabi, a plant is being built for Gulf Sponge Iron. In addition, two modules are under construction in Egypt, one at Ezz Rolling Mills and the other at Suez Steel. Finally, a module at Sidor in Venezuela is being converted to HYL III.

**Rotary Kiln Coal-based**

• Numerous rotary kiln furnaces began operation as capacity rose by 3.2 million tons per year, almost all within India. Additional kilns are under construction.

**2009 World Shaft Furnace Production by Process**



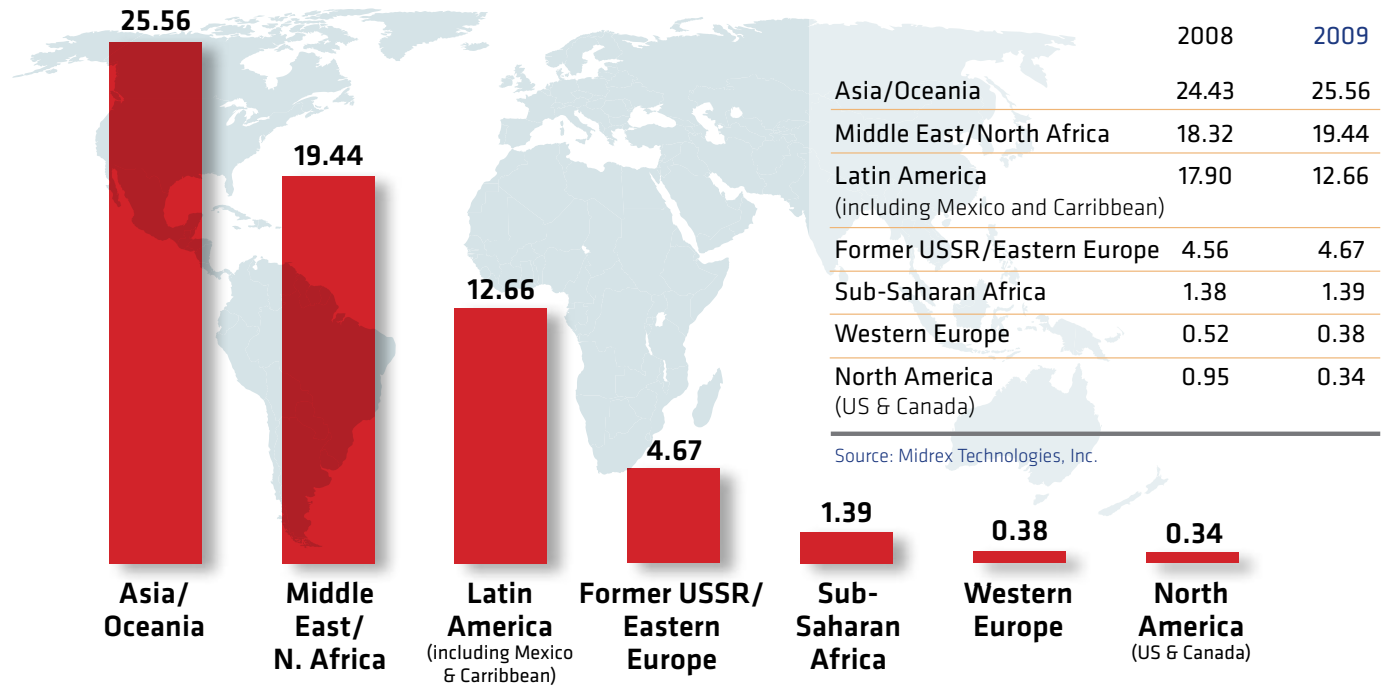
**Total World Production: 46.6 Mt**

	2008	2009
MIDREX	80.1%	82.9%
HYL/Energiron	19.9%	17.1%

Source: Midrex Technologies, Inc.

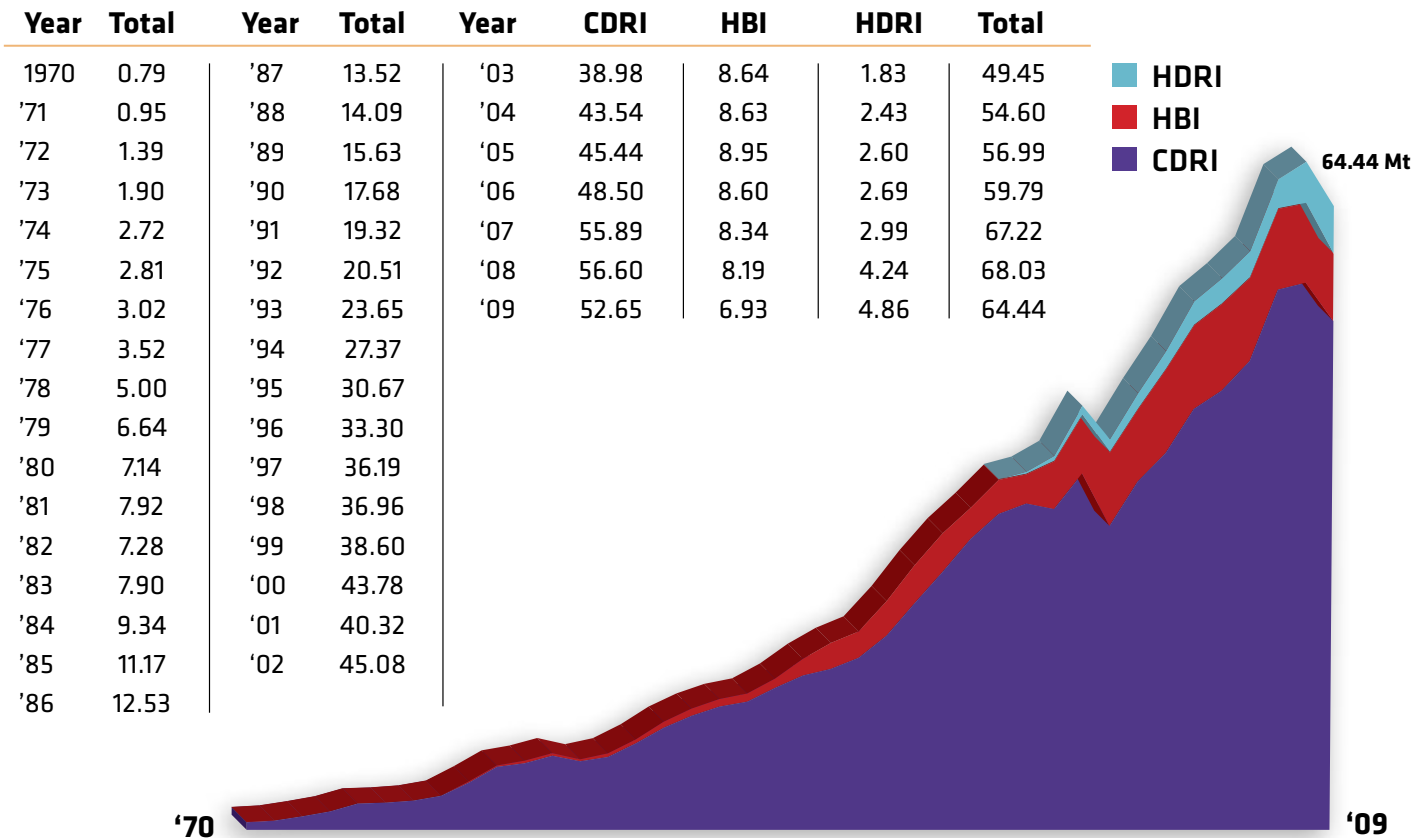


## 2009 World DRI Production by Region (Mt)



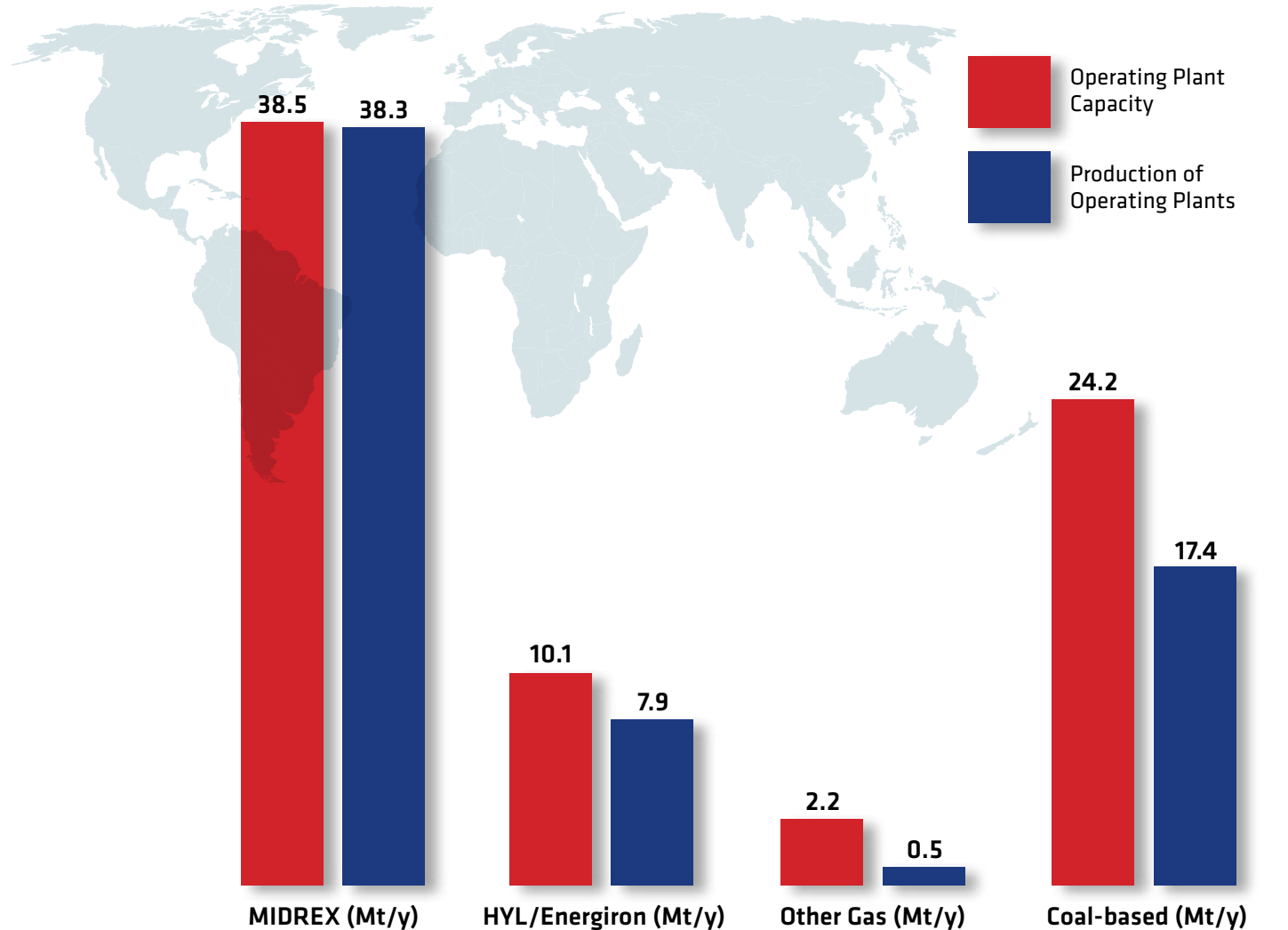
## World DRI Production by Year (Mt)

Source: Midrex Technologies, Inc.





## 2009 World Direct Reduction Capacity Utilization by Process



	Midrex (Mt/y)	# of Midrex modules	HYL/Energiron (Mt/y)	# of HYL/Energiron modules	Other Gas (Mt/y)	Coal-based (Mt/y)
Installed Capacity	40.6	58	15.1	26	2.2	N/A
Idled Plant Capacity	2.0	4	5.4	10	0.0	N/A
Operating Plant Capacity	38.5	54	9.7	16	2.2	24.2
Production of Operating Plants	38.3		7.9		0.5	17.4
Capacity Utilization (%)	99.5		81.9		22.7	72.0

Source: Midrex Technologies, Inc.

NOTE: Installed capacity is that which was installed as of January 1, 2009  
 Idled capacity indicates those plants that are in operable condition, but which did not operate in 2009  
 2009 capacity' is 'Installed capacity' less 'Idled capacity'

SPECIAL NOTE: In all cases, production was strongly curtailed as an effect of the world financial crisis.



## 2009 World DRI Production by Region (Mt)

Source: Midrex Technologies, Inc.

NAME	'70-'89	'90	'91	'92	'93	'94	'95	'96	'97	'98
<b>Latin America</b>										
ARGENTINA	11.15	1.03	0.91	0.98	1.16	1.27	1.33	1.42	1.50	1.54
BRAZIL	4.04	0.29	0.29	0.29	0.25	0.22	0.30	0.34	0.32	0.34
MEXICO	28.81	2.48	2.47	2.44	2.73	3.24	3.70	3.90	4.54	5.68
PERU	0.49	0.04	0.03	0.03	-	0.02	0.003	0.02	0.12	0.11
TRINIDAD & TOBAGO	3.35	0.70	0.70	0.68	0.73	0.94	1.05	1.07	1.24	1.14
VENEZUELA	22.86	3.02	4.02	4.23	4.51	4.71	4.72	5.34	5.36	5.06
<b>Middle East/N. Africa</b>										
EGYPT	2.07	0.71	0.62	0.85	0.85	0.78	0.85	0.83	1.19	1.61
IRAN	0.30	0.29	0.70	0.83	1.65	2.63	3.23	3.81	4.38	3.69
IRAQ	0.19	0.17	-	-	-	-	-	-	-	-
LIBYA	0.09	0.50	0.78	0.85	0.94	0.85	0.97	0.83	0.99	1.01
QATAR	5.10	0.58	0.55	0.62	0.56	0.60	0.63	0.64	0.57	0.71
SAUDI ARABIA	6.57	1.09	1.12	1.61	2.01	2.11	2.13	2.30	2.11	2.27
UAE	-	-	-	-	-	-	-	-	-	-
<b>Asia/Oceania</b>										
AUSTRALIA	-	-	-	-	-	-	-	-	-	-
CHINA	-	-	-	-	-	-	-	-	-	0.08
INDIA	1.08	0.61	1.15	1.44	2.21	3.12	4.28	4.84	5.26	5.26
INDONESIA	8.59	1.41	1.43	1.37	1.50	1.62	1.86	1.80	1.60	1.64
JAPAN	0.05	-	-	-	-	-	-	-	-	-
MALAYSIA	2.87	0.62	0.62	0.55	0.71	0.99	1.09	1.48	1.72	0.91
MYANMAR	0.15	0.02	0.01	0.01	0.02	0.01	0.02	0.04	0.04	0.04
<b>North America</b>										
CANADA	10.20	0.73	0.56	0.63	0.74	0.77	1.01	1.42	1.39	1.24
US	7.15	0.39	0.41	0.39	0.44	0.48	0.46	0.45	0.51	1.60
<b>Former USSR/Eastern Europe</b>										
RUSSIA	6.12	1.69	1.70	1.58	1.54	1.71	1.68	1.50	1.73	1.55
<b>Sub-Saharan Africa</b>										
NIGERIA	1.13	0.11	0.12	0.05	0.04	0.04	0.02	0.02	-	-
SOUTH AFRICA	4.77	0.90	0.90	0.91	0.87	0.98	0.95	0.90	1.09	1.05
<b>Western Europe</b>										
GERMANY	5.23	0.31	0.26	0.17	0.18	0.28	0.41	0.37	0.47	0.45
ITALY	0.02	-	-	-	-	-	-	-	-	-
SWEDEN	0.04	-	-	-	-	-	-	-	-	-
<b>WORLD TOTAL</b>	<b>135.26</b>	<b>17.68</b>	<b>19.32</b>	<b>20.51</b>	<b>23.65</b>	<b>27.37</b>	<b>30.67</b>	<b>33.30</b>	<b>36.19</b>	<b>36.96</b>

## 2009 World DRI Production by Process (Mt)

NAME	'70-'89	'90	'91	'92	'93	'94	'95	'96	'97	'98
MIDREX	71.12	10.73	11.96	13.26	15.91	17.83	19.86	21.03	23.08	24.82
HYL/Energiron	48.60	5.25	5.40	5.29	5.73	7.01	8.15	9.12	9.55	8.52
Other Shaft Furnace/Retort Processes	0.53	0.06	0.16	0.02	0.02	0.01	0.04	0.15	0.10	0.09
Fluidized Bed Processes	3.49	0.39	0.37	0.36	0.39	0.42	0.45	0.44	0.48	0.40
Rotary Kiln, Coal-based	11.52	1.25	1.43	1.57	1.61	2.13	2.17	2.56	3.01	2.94
Rotary Hearth, Coal-based	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>WORLD TOTAL</b>	<b>135.26</b>	<b>17.68</b>	<b>19.32</b>	<b>20.51</b>	<b>23.65</b>	<b>27.37</b>	<b>30.67</b>	<b>33.30</b>	<b>36.19</b>	<b>36.96</b>





## 2009 World DRI Production by Region (Mt)

Source: Midrex Technologies, Inc.

NAME	'99	'00	'01	'02	'03	'04	'05	'06	'07	'08	'09
<b>Latin America</b>											
ARGENTINA	0.99	1.42	1.28	1.46	1.74	1.74	1.83	1.95	1.81	1.86	0.81
BRAZIL	0.40	0.42	0.43	0.36	0.41	0.44	0.43	0.38	0.36	0.30	0.01
MEXICO	6.24	5.83	3.67	4.90	5.62	6.54	5.98	6.17	6.26	6.01	4.15
PERU	0.05	0.08	0.07	0.03	0.08	0.08	0.09	0.14	0.09	0.07	0.10
TRINIDAD & TOBAGO	1.30	1.53	2.31	2.32	2.28	2.36	2.25	2.08	3.47	2.78	1.99
VENEZUELA	5.05	6.69	6.38	6.89	6.90	7.83	8.95	8.61	7.71	6.87	5.61
<b>Middle East/N. Africa</b>											
EGYPT	1.67	2.11	2.37	2.53	2.87	3.02	2.90	3.10	2.79	2.64	2.91
IRAN	4.12	4.74	5.00	5.28	5.62	6.41	6.85	6.85	7.44	7.46	8.20
IRAQ	-	-	-	-	-	-	-	-	-	-	-
LIBYA	1.33	1.50	1.09	1.17	1.34	1.58	1.65	1.63	1.64	1.57	1.11
QATAR	0.67	0.62	0.73	0.75	0.78	0.83	0.82	0.88	1.30	1.68	2.10
SAUDI ARABIA	2.36	3.09	2.88	3.29	3.29	3.41	3.63	3.58	4.34	4.97	5.03
UAE	-	-	-	-	-	-	-	-	-	-	0.09
<b>Asia/Oceania</b>											
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	0.18	0.00
INDIA	5.22	5.44	5.59	6.59	7.67	9.37	12.04	14.74	19.06	21.20	22.03
INDONESIA	1.74	1.82	1.48	1.50	1.23	1.47	1.39	1.29	1.42	1.29	1.23
JAPAN	-	-	-	-	-	-	-	-	-	-	-
MALAYSIA	0.96	1.26	1.12	1.08	1.60	1.68	1.38	1.54	1.84	1.94	2.30
MYANMAR	0.03	0.04	0.04	0.04	0.04	0.04	-	-	-	-	-
<b>North America</b>											
CANADA	0.92	1.13	-	0.18	0.50	1.09	0.59	0.45	0.91	0.69	0.34
US	1.67	1.56	0.12	0.47	0.21	0.18	0.22	0.24	0.25	0.26	-
<b>Former USSR/Eastern Europe</b>											
RUSSIA	1.88	1.92	2.51	2.91	2.91	3.14	3.34	3.28	3.41	4.56	4.67
<b>Sub-Saharan Africa</b>											
NIGERIA	-	-	-	-	-	-	-	-	0.15	0.20	-
SOUTH AFRICA	1.16	1.53	1.56	1.55	1.54	1.63	1.78	1.75	1.74	1.18	1.39
<b>Western Europe</b>											
GERMANY	0.40	0.46	0.21	0.54	0.59	0.61	0.44	0.58	0.59	0.52	0.38
ITALY	-	-	-	-	-	-	-	-	-	-	-
SWEDEN	-	-	-	-	-	-	-	-	-	-	-
<b>WORLD TOTAL</b>	<b>38.59</b>	<b>43.78</b>	<b>40.32</b>	<b>45.08</b>	<b>49.45</b>	<b>54.60</b>	<b>56.99</b>	<b>59.79</b>	<b>67.22</b>	<b>68.03</b>	<b>64.44</b>

## 2009 World DRI Production by Process (Mt)

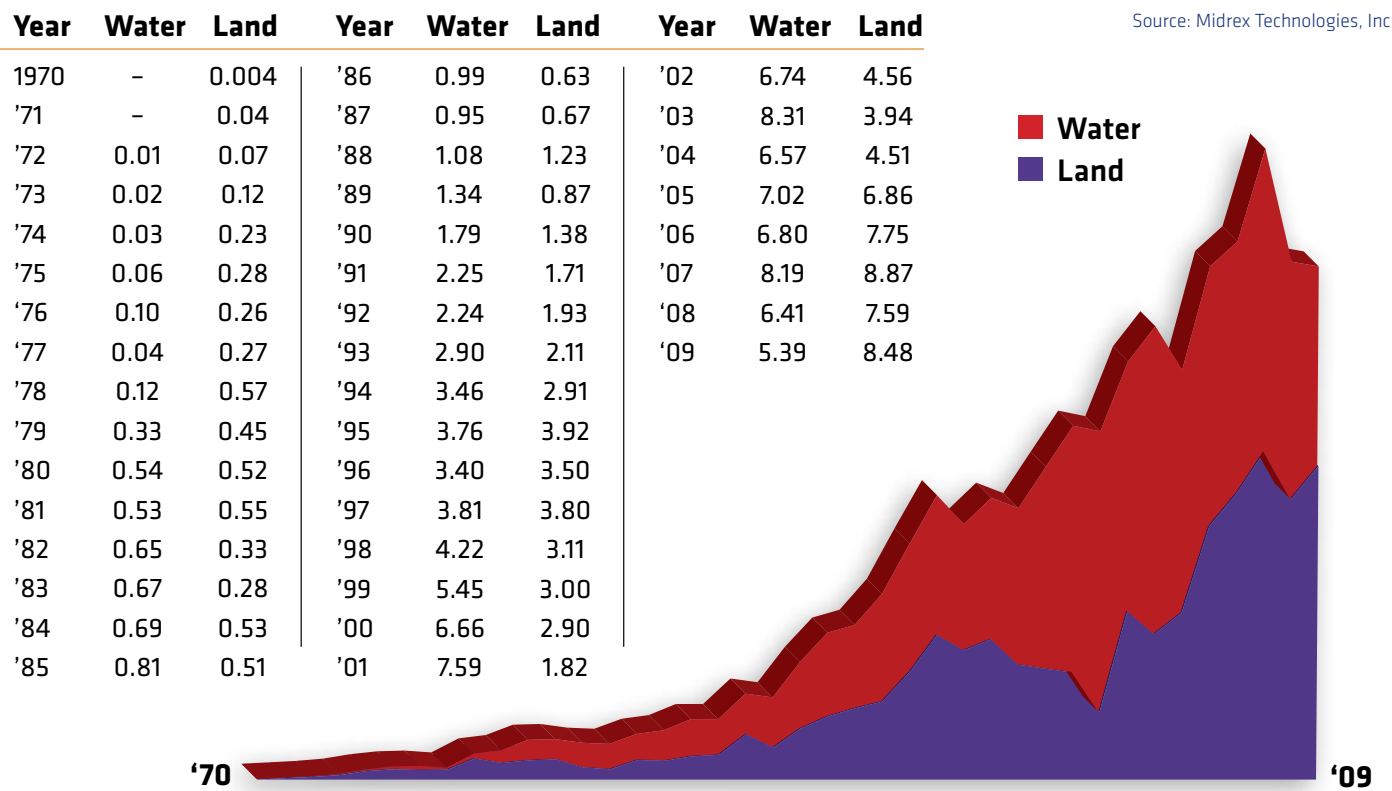
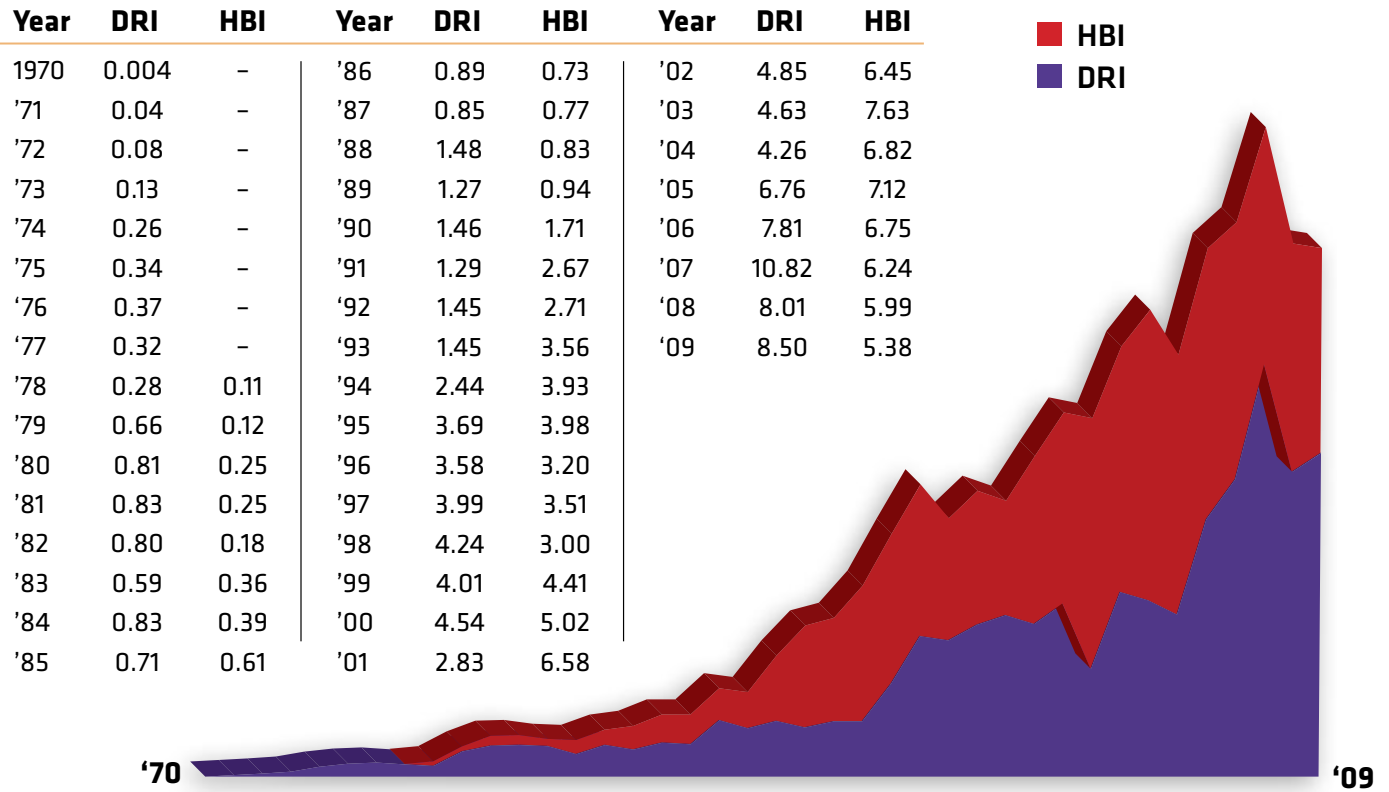
NAME	'99	'00	'01	'02	'03	'04	'05	'06	'07	'08	'09
MIDREX	26.12	30.12	26.99	30.11	32.06	35.01	34.96	35.71	39.72	39.85	38.62
HYL/Energiron	8.81	9.39	8.04	8.88	9.72	11.34	11.12	11.00	11.30	9.92	7.99
Other Shaft Furnace/Retort Processes	0.07	0.15	0.14	0.04	0.04	0.04	0.00	0.00	0.00	0.00	0.00
Fluidized Bed Processes	0.66	0.96	1.93	1.63	2.57	1.62	1.52	1.31	1.05	1.08	0.50
Rotary Kiln, Coal-based	2.94	3.14	3.18	4.43	5.04	6.41	9.17	11.53	14.90	16.84	17.33
Rotary Hearth, Coal-based	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.34	0.00
<b>WORLD TOTAL</b>	<b>38.59</b>	<b>43.78</b>	<b>40.32</b>	<b>45.08</b>	<b>49.45</b>	<b>54.60</b>	<b>56.99</b>	<b>59.79</b>	<b>67.22</b>	<b>68.03</b>	<b>64.44</b>





## World DRI Shipments (Mt)

Source: Midrex Technologies, Inc.





## World Direct Reduction Plants

Status as of 12/31/09 Source: Midrex Technologies, Inc.

Plant	Location	Capacity (Mt/y)	Modules	Product	Start-up	Status*
<b>MIDREX® PROCESS</b>						
ArcelorMittal Steel Hamburg	Hamburg, Germany	0.40	1	DRI	'71	O
ArcelorMittal Canada 1	Contrecoeur, Quebec, Canada	0.40	1	DRI	'73	O
TenarisSiderca	Campana, Argentina	0.40	1	DRI	'76	O
ArcelorMittal Canada 2	Contrecoeur, Quebec, Canada	0.60	1	DRI	'77	I
SIDOR I	Matanzas, Venezuela	0.35	1	DRI	'77	O
Acindar	Villa Constitucion, Argentina	0.60	1	DRI	'78	O
Qatar Steel I	Mesaieed, Qatar	0.40	1	DRI	'78	O
SIDOR II	Matanzas, Venezuela	1.29	3	DRI	'79	O
ArcelorMittal Steel Point Lisas I & II	Point Lisas, Trinidad & Tobago	0.84	2	DRI	'80/'82	I/O
Global Steel Holdings	Warri, Nigeria	1.02	2	DRI	'82	I
Hadeed A & B	Al-Jubail, Saudi Arabia	0.80	2	DRI	'82/'83	O
OEMK I - IV	Stary Oskol, Russia	1.67	4	DRI	'83/'85/'85/'87	O
Antara Steel Mills	Labuan Island, Malaysia	0.65	1	HBI	'84	O
Khouzestan Steel Co. I - IV	Ahwaz, Iran	1.84	4	DRI	'89/'90/'92/'01	O
EZDK I	El Dikheila, Egypt	0.72	1	DRI	'86	O
LISCO 1 & 2	Misurata, Libya	1.10	2	DRI	'89/'90	O
Essar Steel I & II	Hazira, India	0.88	2	HBI/HDRI	'90	O
FMO	Puerto Ordaz, Venezuela	1.00	1	HBI	'90	O
VENPRECAR	Matanzas, Venezuela	0.82	1	HBI	'90	O
Essar Steel III	Hazira, India	0.44	1	HBI/HDRI	'92	O
Hadeed C	Al-Jubail, Saudi Arabia	0.65	1	DRI	'92	O
Mobarakeh Steel A - E	Mobarakeh, Iran	3.20	5	DRI	'92/'93/'94	O
Ispat Industries, Ltd.	Raigad, India	1.00	1	DRI	'94	O
EZDK II	El Dikheila, Egypt	0.80	1	DRI	'97	O
LISCO 3	Misurata, Libya	0.65	1	HBI	'97	O
ArcelorMittal Steel Lázaro Cárdenas	Lázaro Cárdenas, Mexico	1.20	1	DRI	'97	O
COMSIGUA	Matanzas, Venezuela	1.00	1	HBI	'98	O
ArcelorMittal Steel Point Lisas III	Point Lisas, Trinidad & Tobago	1.36	1	DRI	'99	O
ArcelorMittal Steel South Africa	Saldanha Bay, South Africa	0.80	1	DRI	'99	O
EZDK III	El Dikheila, Egypt	0.80	1	DRI	'00	O
Essar Steel IV	Hazira, India	1.00	1	HBI/HDRI	'04	O
Nu-Iron	Point Lisas, Trinidad & Tobago	1.60	1	DRI	'06	O
Essar Steel V	Hazira, India	1.50	1	HBI/HDRI	'06	O
Mobarakeh Steel F	Mobarakeh, Iran	0.80	1	DRI	'06	O
DRIC I & II	Dammam, Saudi Arabia	1.00	2	DRI	'07	O
Hadeed E	Al-Jubail, Saudi Arabia	1.76	1	HDRI/DRI	'07	O
LGOK II	Gubkin, Russia	1.40	1	HBI	'07	O
Qatar Steel II	Mesaieed, Qatar	1.50	1	HDRI/HBI	'07	O
Khouzestan Steel V	Ahwaz, Iran	0.80	1	DRI	'08	O
Lion DRI	Banting, Malaysia	1.54	1	HDRI/HBI	'08	O
HOSCO I & II	Bandar Abbas, Iran	1.65	2	DRI	'09/'10	O/C
Tuwairqi Steel Mills	Karachi, Pakistan	1.28	1	HDRI/DRI	'10	C
IMPADCO	Khorasan (Mashad), Iran	0.80	1	DRI	'10	C
Essar Steel VI	Hazira, India	1.50	1	HBI/HDRI	'10	C
ESISCO	Sadat City, Egypt	1.76	1	HDRI/DRI	'10	C
IGISCO	Ardakan (Yazd), Iran	0.80	1	DRI	'10	C
Khorasan Steel	Khorasan (Mashad), Iran	0.80	1	DRI	'10	C
Shadeed	Sohar, Oman	1.50	1	HDRI/HBI	'11	C
Arfa Steel	Ardakan (Yazd), Iran	0.80	1	DRI	'11	C
Jindal Steel & Power	Angul, India	1.80	1	HDRI/DRI	'12	C
		53.27	69			

\* Status Codes: O - Operating I - Idle C - Construction





## World Direct Reduction Plants

Status as of 12/31/09 Source: Midrex Technologies, Inc.

Plant	Location	Capacity (Mt/y)	Modules	Product	Start-up**	Status*
<b>HYL/ENERGIRON PROCESS</b>						
PT Krakatau Steel 1	Cilegon, Indonesia	0.56	1	DRI	'78	I
PT Krakatau Steel 2	Cilegon, Indonesia	0.56	1	DRI	'78	I
Sidor H2	Matanzas, Venezuela	1.40	3	DRI	'81	O
Ternium 3M5	Monterrey, Mexico	0.50	1	DRI	'83	O
ArcelorMittal Lázaro Cárdenas I	Lázaro Cárdenas, Mexico	1.00	2	DRI	'88	I
ArcelorMittal Lázaro Cárdenas II	Lázaro Cárdenas, Mexico	1.00	2	DRI	'91	O
Welspun Maxsteel Ltd.	Raigad, India	0.75	1	HBI/DRI	'93	I
PT Krakatau Steel	Cilegon, Indonesia	1.35	2	DRI	'93	O
Khouzestan Steel (ASCO)	Ahwaz, Iran	1.03	3	DRI	'93	I
Perwaja Steel	Kemaman, Malaysia	1.20	2	DRI	'93	O
Usiba	Salvador Bahia, Brazil	0.31	1	DRI	'94	O
Ternium 2P5	Puebla, Mexico	0.61	1	DRI	'95	O
Ternium 4M	Monterrey, Mexico	0.68	1	HDRI	'98	O
Lebedinsky GOK	Gubkin, Russia	0.90	1	HBI	'99	O
Hadeed D	Al-Jubail, Saudi Arabia	1.10	1	DRI	'99	O
Matesi	Matanzas, Venezuela	1.50	2	HBI	'00	I
Welspun Maxsteel Ltd. 2	Raigad, India	0.60	1	DRI	'07	O
Emirates Steel I (GHC)	Abu Dhabi, UAE	1.60	1	HDRI	'09	O
Gulf Sponge Iron	Abu Dhabi, UAE	0.20	1	DRI	'10	C
Sidor	Matanzas, Venezuela	0.80	1	DRI	'10	C
Emirates Steel II (GHC)	Abu Dhabi, UAE	1.60	1	HDRI	'11	C
Ezz Rolling Mills	Egypt	1.90	1	DRI	'11	C
Suez Steel	Egypt	1.95	1	DRI	'12	C
		23.10	32			
<b>FINMET PROCESS</b>						
Orinoco Iron	Matanzas, Venezuela	2.20	4	HBI	'00	O
		2.20	4			
<b>SL/RN PROCESS</b>						
Piratini	Charquedas, Brazil	0.06	1	DRI	'73	I
SIIL	Paloncha, India	0.06	2	DRI	'80/'85	O
Siderperu	Chimbote, Peru	0.10	3	DRI	'80	I
ISCOR	Vanderbijlpark, South Africa	0.72	4	DRI	'84	O
Bihar Sponge Iron, Ltd.	Chandil, India	0.15	1	DRI	'89	O
Prakash Industries	Champa, India	0.40	2	DRI	'93/'96	O
Nova Iron & Steel	Bilaspur, India	0.15	1	DRI	'94	O
Sree Metallics	Keonjhar, India	0.06	3	DRI	'99/'00	O
Ashirwad	Jamshedpur, India	0.05	2	DRI	'00	O
Vandana Global	Siltara, Raigarh, India	0.05	1	DRI		O
		1.80	20			
<b>JINDAL PROCESS</b>						
Jindal Steel & Power	Raigarh, India	0.90	6	DRI	'93/'94/'95/'96/'00	O
Monnet Ispat	Raipur, India	0.30	2	DRI	'93/'98	O
Rexon Strips Ltd.	Via Lathikata, India	0.06	2	DRI	'93/'00	O
		1.26	10			
<b>DRC PROCESS</b>						
Scaw Metals I	Germiston, South Africa	0.18	2	DRI	'83/'89	O
Scaw Metals II	Germiston, South Africa	0.15	1	DRI	'97	O
Tianjin Iron & Steel	Tianjin, China	0.30	2	DRI	'97	O
		0.63	5			

\* Status Codes: O - Operating I - Idle C - Construction



## World Direct Reduction Plants

Status as of 12/31/09 Source: Midrex Technologies, Inc.

Plant	Location	Capacity (Mt/y)	Modules	Product	Start-up**	Status*/*
<b>CODIR PROCESS</b>						
Dunswart	Benoni, South Africa	0.15	1	DRI	'73	O
Sunflag	Bhandara, India	0.15	1	DRI	'89	O
Goldstar	Mallividu, India	0.22	2	DRI	'92	I
		0.52	4			
<b>CIRCORED PROCESS</b>						
Mittal - ISG Trinidad	Point Lisas, Trinidad & Tobago	0.50	1	HBI	'99	I
<b>IRON DYNAMICS PROCESS</b>						
Iron Dynamics	Butler, IN, USA	0.50	1	DRI	'98	O
<b>SHENWU RHF PROCESS</b>						
Tianjin Rockcheck	Tianjin, China	0.50	1	DRI	'10	C
<b>FIOR PROCESS</b>						
Operaciones rDI	Matanzas, Venezuela	0.40	1	HBI	'76	I
<b>TISCO PROCESS</b>						
Tata Sponge Iron, Ltd.	Keonjhar, Orissa, India	0.24	2	DRI	'86/'98	O
Vallabh Steels	Ludhiana, Punjab, India	0.12	1	DRI		O
		0.36	3			
<b>SIIL PROCESS</b>						
Bellary Steel & Alloys	Bellary, Karnetaka, India	0.06	2	DRI	'92/'93	O
HEG	Borai, India	0.09	2	DRI	'92	O
Kumar Met.	Nalgonda, India	0.06	2	DRI	'93	O
Raipur Alloys & Steel	Raipur, India	0.06	2	DRI	'93	O
Aceros Arequipa	Pisco, Peru	0.08	2	DRI	'96	O
		0.35	10			
<b>PUROFER PROCESS</b>						
ASCO	Ahwaz, Iran	0.33	1	DRI	'77	I
<b>OSIL PROCESS</b>						
OSIL	Keonjhar, Orissa, India	0.10	1	DRI	'83	O
Lloyd's Metals & Eng.	Ghugus, India	0.15	1	DRI	'95	O
		0.25	2			
<b>DAV PROCESS</b>						
Davsteel	Cullinan, South Africa	0.04	1	DRI	'85	O

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 hundreds of small rotary kilns in India with annual capacities of 10,000-30,000 tons per year that are not included on this list. The total capacity of all rotary kilns in India is estimated to be 19.5 Mt/y.

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 - Construction

\*\* Blanks indicate insufficient information



2009 WORLD DIRECT REDUCTION STATISTICS is compiled by Midrex Technologies, Inc., Charlotte, North Carolina, USA. The publication is distributed annually with the first quarter issue of Direct From Midrex, and upon request to other persons interested in direct reduction.

Midrex Technologies, Inc. compiles world DRI production data on an annual basis as a service to 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 an international process engineering and technology company that provides global process technology solutions to various industries and is principally known for the MIDREX® Direct Reduction Process that converts iron ore into a high-purity DRI or HBI for use in steelmaking, ironmaking, and foundry applications. Midrex continues to develop new technologies relating to its traditional iron and steel roots including

eco-friendly technologies such as FASTMET®/FASTMELT® steel waste recycling processes and ITmk3®, a breakthrough process for producing a pig iron substitute material.

The following organizations supplied or assisted in collecting data for this issue of 2009 WORLD DIRECT REDUCTION STATISTICS:

*IVES – Venezuela*

*Orinoco Iron – Venezuela*

*Sponge Iron Manufacturers Association – India*

*Tenova HYL – Mexico*

*World Steel Association – Belgium*

*All Individual MIDREX® Direct Reduction Plants*

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