SIMA
Sponge Iron Manufacturers Association

Indian voice for the ore based metallic & steel industry

DRI UPDATE

October 2015

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EDITORIAL

Dear Readers

We are bringing out this issue at a time when the entire steel industry including the sponge iron industry is facing one of its worst crisis. We have seen such crisis in the past but this time there are so many uncertainties associated with raw materials availability & their prices, sluggish domestic and global market conditions, dumping of steel etc. As you all are aware, present Government has decided to auction all natural resources. Process of auctioning of coal is on. Successful bidders are now realizing high cost of blocks which is likely to make their operations unviable. It will be interesting to watch the outcome of next rounds. Auctioning of coal linkages are also expected to take off shortly. However, there are uncertainties about the cost and quantities. As regard to the iron ore, another vital input, auction rules have been published and Government is confident that some of the states will start auctioning the non coal minerals before December, 2015. However, experts are of the view that auctioning of the minerals is unlikely to start by December, 2015 in view of many uncertainties like clarity on end use and disposal conditions, allocation of licenses to the Government companies, future stability on taxes & levies, auction of composite licenses, non-exclusion reconnaissance permits, merchant miners' participations, excess to block related infrastructure, transfer of mining concession etc. Besides these, it is understood that state Governments are finding it difficult to get the global positioning system coordinates to demarcate the boundaries of the proposed auctioning blocks.

Another serious problem which is going to further aggravate the problems of the Indian DRI industry is fast tumbling of international prices of steel melting scrap. Severe price reduction in the import of steel scrap is going to further impact DRI producers. Immediate preventive measures are required to be taken by the Government of India.

As we all know, Government is of the view that India will need 300 million tonnes production capacity by 2025 to meet the emerging demand of steel. In today's situation, this appears to be very ambitious target. But one thing is certain that is additional about 200 million tonnes steel capacity cannot be set up entirely based on the conventional BF-BOF route. DRI industry is going to play a major role to supplement the requirement of steel in the country. Government needs to make serious efforts to revive this important industry.

Happy Vijaya Dashmi to all the readers.

DEEPENDRA KASHIVA

SIMA
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CHAIRMAN'S MESSAGE

The Steel Industry is an important core sector for a growing economy like India, which is expected to grow significantly over the next decade with its per capita consumption nearly at one fourth of the global average. A healthy growing domestic steel industry is a pre-requisite for India to succeed in its vision of 'Make in India' and achieve Government target of steel capacity of 300 million tonnes by 2025. The proposed FTA of Regional Comprehensive Economic Partnership of Asia and the Pacific (RCEP) is under advanced negotiations and will be soon a reality. It will open up the Indian steel market to China, already having huge exportable surplus and will be a threat to Indian steel industry. Although the Government is discussing measures to mitigate the threat, Indian steel industry needs to tighten the belt and become competitive.

World steel production fell by 2.3% during Jan – Aug'2015 to 1.08 billion ton, mainly due to slowing Chinese domestic demand and rapidly rising Chinese exports, creating cascading effect on other steel producing nations. Indian steel production grew by 4.1% for same period to 60.55 million ton. The world DRI production in 2014 fell marginally by 0.5% to 74.55 million tons, due to natural gas shortages, decline in India and weak global steel market. India continues to maintain the top position with 17.31 million tons, followed by Iran with 14.55 million ton, which is fast bridging the gap. Indian DRI production dropped by 2.6% over 2013 due to shortages of iron ore, coal and natural gas.

The growth of Indian DRI Industry is very critical in secondary steel segment to achieve the Governments ambitious target for 2025. Innovative approach is required to counter the shortages of key inputs and logistics challenges for DRI Industry. We should continue to explore new avenues to reduce our cost of production and to maximize the use of our installed production facilities.

Considering this, SIMA is doing commendable work on key issues and challenges facing the industry, under management of Mr. Deependra Kashiva and hope the Industry will achieve greater heights.

PRAKASH TATIA

Suggestions to Mitigate the Problems Being Faced by Indian Sponge Iron Industry

Deependra Kashiva, ED, SIMA

Indian sponge iron industry is passing through its worst crisis. At the one hand the industry is operating at about 30 to 40% capacity on the other hand there is promising future in view of the projected steel demand.

Main reasons for low capacity utilization can be attributed to the following factors:

- Shortage of basic raw materials like iron ore, non-coking coal etc at affordable prices
- Severe competition from imported steel melting scrap
- Sluggish market conditions
- Dumping of steel particularly from China
- High cost of funding

Suggestions to revive the sponge iron industry

1. Iron ore

1.1 In the Auction Rules, 2015 not only the sponge iron should be included but also the requirement of merchant pig iron plants/pellet plants should also be included.

1.2 PSUs like NMDC, OMC, etc. should have special dispensation to meet the requirement s of the small sponge iron/pig iron/sinter plants/pellet plants in terms of quantity and price.

1.3 Present pricing mechanism for iron ore is faulty. There is no standard mechanism unlike the international practice of fixing the iron ore prices. There is immediate need to evolve a mechanism for the fixation of iron ore prices.

1.4 To ease the availability of iron ore from domestic sources and reducing dependence on the imports required Environment Clearance and other clearances should be expedited

1.5 The logistic cost within India add upto 50% to 100% of the ex mine price to further add to the woes.

2. Non-coking coal

2.1 Sufficient number of captive coal mines of high grades of coal should be earmarked to meet the present and future requirement of sponge iron industry.

2.2 During the competitive bidding of coal mines, sponge iron sector should not be clubbed with cement and CPP sectors. Coal mines of high grades should be exclusively reserved for iron & steel sector as coal is a process necessity unlike the other sectors.

2.3 Under the proposed mechanism of auction of coal linkages, all sponge iron producing units should be covered (post 2007). CIL should earmark a certain quantity to this sector and should not focus on profitability only, as non-coking coal is key raw material and not fuel unlike the other sectors.

2.4 Under the proposed linkage auctioning mechanism, there should be separate category for iron & steel and should not be linked with other sectors like fertilizer, power plants etc.

2.5 There should be special dispensation for the smaller units as they are unlikely to compete successfully in the proposed linkage auctioning mechanism.

2.6 Railway should accords same priority in allocation of rakes as is given to steel.

3. Natural Gas

3.1 Gas based sponge iron plants were set up to utilize NG with huge investment on the investigation of the Government. Present availability is about 15% of the total requirement resulting substantial loss in production. Huge investment made on the basis of contractual obligations should be honored.

4. Threat from the import of steel melting scrap

4.1 Steel scrap is not a manufactured product (it is a waste generation) and has flexibility to adjust the sales price to manipulate the market while sponge iron is a manufactured product and has no flexibility in pricing due to standard cost structure based on raw material inputs of iron ore/coal/natural gas.

4.2 SIMA is of the view that there should be judicious duty structure on steel scrap taking into consideration of huge investment, employment and contribution to the exchequer by DRI industry. We firmly believe that DRI producers and steel producers using steel scrap need to grow together as they are complementary and supplementary to each other.

5. Sluggish market

Because of the low demand of steel in the country and higher import of cheaper steel particularly from China, demand of the sponge iron has drastically come down impacting bottom lines of almost all the sponge iron producers. Government should start incurring heavy expenditure in the infrastructure and housing sectors to generate steel demand in the country.

Secondly, import Duty on steel products should be uniformly increased to 15% to save struggling Indian steel industry.

6. Financial constraints

Almost all iron & steel units are incurring heavy losses and are not able to repay their loan. Due to over exposure to steel sector, banks & FIs are reluctant to further finance iron & steel sector.

SIMA's suggestions on these issues are:

6.1 One Time settlement (OTS) of existing term loan/Corporate Loan.

6.2 Three years moratorium/deferment for repayment of existing Term Loan/Corporate Loan.

6.3 Interest holidays i.e. waiver of interest for 3 years.

6.4 Concessions in interest rate on entire Term Loan & Working Capital Loan.

6.5 Concessions to be granted for reduction in margins on current assets. This will help sponge iron and sponge iron based steel plants to have additional working capital at their disposal, which in turn will help to improve capacity utilization.

6.6 Proposed dedicated steel finance institute should also include DRI and other secondary steel sector.

7. Technology improvement

Gas based technology for production of sponge iron is more energy efficient and environmental friendly compare to coal based technologies being used presently in India. However, due to the limited availability of natural gas from domestic sources, high cost of imported gas and lack of proven techno commercially viable alternate technologies, presently there is no other alternate but to follow the existing coal based technologies. Large modules with waste heat recovery boiler power generating system should be encouraged. For this incentives should be given to installing waste heat recovery boiler power generating system and power generated from such system should be recognized as "green power" under the REC Mechanism in vogue.

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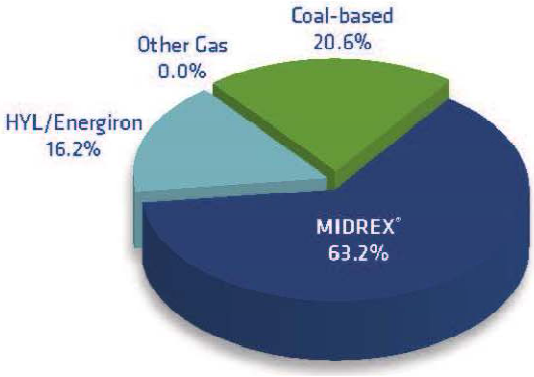
Advanced MIDREX® DRI Production Technology using Alternative Fuels - A Reality Now

Suprio Lahiri, Director - India Operations, Midrex Technologies India Pvt. Ltd.
Amit Kumar Jha, AGM-Marketing, Midrex Technologies India Pvt. Ltd.
Christopher Ravenscroft, Manager, Global Marketing and Communications, Midrex Technologies,Inc.

World DRI Scenario in 2014:

The world's direct reduction industry produced 74.55 million tons of DRI Products in 2014 according to data compiled by Midrex Technologies, Inc. and audited by World Steel Dynamics. Production fell slightly from 2013 due to natural gas shortages and curtailments in India and operational disruptions in other DRI producing regions as well general downturn in steel market conditions. Plants based on MIDREX® Direct Reduction Technology accounted for 47.12 million tons, which once again led all technologies with 63.2 percent of the market total. (Figure1).

2014 World DRI Production by Process



Total World Production: 74.6 Mt

	2012	2013	2014
MIDREX®	61.2%	63.5%	63.2%
HYL/Energiron	14.8%	15.1%	16.2%
Other Gas	0.7%	0.2%	0.0%
Coal-based	23.3%	21.3%	20.6%

Source: Midrex Technologies, Inc.

DRI growth was evident in a number of nations including the USA, Russia, Canada and four countries in the Gulf region, Bahrain, Iran, Qatar and Saudi Arabia. Various economic and political stresses did, however stunt DRI production in other locations like Libya, Venezuela, Egypt.

The outlook continues to be positive as demand increases in traditional and new markets and as new and low cost energy sources become available for DRI production. Production numbers should bounce back next year as new and recently commissioned capacity will ramp up toward full production. Within the past two years, plants have begun operation in Bahrain, Egypt, India, Iran, Pakistan and the USA. These facilities are steadily increasing production and are expected to make more in each of the ensuing

years. A large amount of additional capacity is under construction in Egypt, Russia, USA, Venezuela and Algeria, which also will contribute to growth.

Indian DRI Scenario in 2014:

India remains the world's largest DRI producer but faces challenges unique to the country. India's production fell down to 17.3 million tons in 2014 from last year's production of 17.8 million tons. This was down from the all-time high that India had enjoyed only four years earlier when it made 23.4 million tons in 2010. More than 70% of the DRI made was from rotary kiln processes. The main reasons for the decline were the same difficulties that have been seen in the past few years, which include: lower availability of domestic iron ore and coal due to regulations, licensing related to environmental requirements and extremely high prices of natural gas. India's steel industry will continue to grow to keep pace with its growing economy. Because of India's evolution into a mature economy, it will be necessary to produce higher quality metallics, specifically DRI of better quality than rotary kilns can provide. Thus Shaft Furnace DRI Technology such as MIDREX NG™ based Direct Reduction Plants will be necessary for quality sponge iron production. However, India no longer has a good supply of inexpensive natural gas for DRI production. Thus Indian steel producers were looking for a technology to utilize other fuels as an alternative to natural gas.

2014: A New Chapter Begins for DRI Production in India

Midrex addressed the technological need specific to India through MXCOL®, its alternative fuel based DRI technology. MXCOL® is the name and trademark for the commercially proven MIDREX® Shaft Furnace technology that uses Syngas derived from many sources including COREX® export gas and commercial gasifiers (using high or low quality coals or other alternative fuels) which produce reducing gas for the MIDREX® Process to make DRI.

MXCOL® can also receive syngas from sources other than gasifiers because of technological advancements. The new Thermal Reactor System™ (TRS®), jointly developed with Praxair, uses innovative partial oxidation technology to convert and reform various gases, like COG, into a high quality, high temperature synthesis gas for Direct Reduction Iron making. 2014 has been an important year for Midrex and its esteemed customers in India, when two new MIDREX® DRI plants were commissioned by adopting MIDREX® alternative fuel technology. These two new MIDREX® plants coming into operation are:

1) Jindal Steel & Power Ltd (JSPL) MXCOL® Direct Reduction Plant at Angul, Odissa using Syngas produced by a Coal Gasification Plant.
2) JSW COREX®/MIDREX® Direct Reduction Plant at Toranagallu, Karnataka using COREX® export gas.

In addition, JSW, successfully started using Coke Oven Gas (COG) in their existing MIDREX® Direct Reduction Plant at Dolvi, Maharashtra, thereby replacing a part of high cost Natural Gas.

The above three milestones have made **Advanced MIDREX® DRI Production Technology using Alternative Fuels - A Reality Now.**

Steel producers in India, by adopting MIDREX® technology can continue to remain world's leader in DRI production. Details of the above three plants are being discussed below.

JSPL Angul - World's First DRI Plant Based on Syngas from Coal Gasification

In 2014, Jindal Steel & Power Limited (JSPL) commissioned the world's first Direct Reduction Plant based on MIDREX® technology using Syngas from coal gasification at its steel plant in Angul.

Figure-2 –

JSPL Angul-World's First MXCOL® Plant using a Coal Gasifier

OVERVIEW:

☐ Capacity: 1,800,000 tons/year

☐ Location: Angul, India

☐ Products: HDRI/CDRI

☐ Reducing Gas: Syn Gas from Lurgi Coal Gasifier

DRIVING FORCES:

☐ Designed for local iron oxide pellet

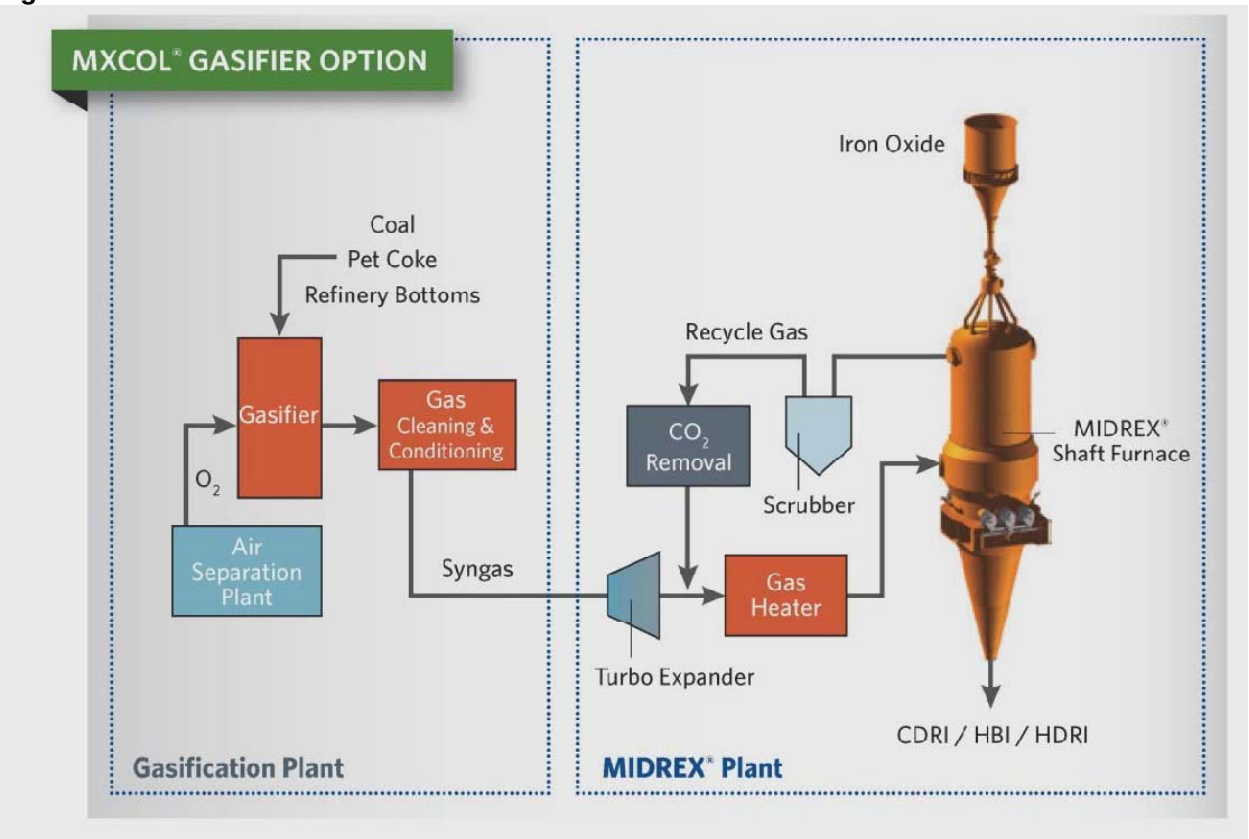
☐ Designed for local high ash coal

☐ HDRI used in an EAF

☐ No coke requirement

A simplified general flowsheet of a coal gasification based MIDREX® DRI plant is shown in Figure 3

Figure 3 –



JSPL - MXCOL® with Gasifier Flowsheet

High ash domestic coal is gasified with high pressure steam and oxygen to produced syngas through partial oxidation. The cold syngas from coal gasification unit is first depressurized to about 3 barg in a turbo expander, which generates electricity. The low pressure syngas is then mixed with recycled process gas from Amine-based CO_2 Removal Unit to produce the required reducing gas. The mixed gas is then heated in a reducing gas heater to 960^o C and charged into the MIDREX® Shaft Furnace, where it reacts with the iron oxide to produce DRI. The gas quality entering MIDREX Shaft Furnace is defined as $(\%H_2 + \% CO) / (\% H_2O + \% CO_2)$ and is maintained around 10, which is able to efficiently produce DRI. DRI is supplied to the Electric Arc Furnace (EAF) as Hot DRI via a Hot Transport System previously developed by Midrex, Primetals (formerly Siemens VAI) and Aumund Fordertechnik or as cold DRI to storage silos.

JSW Dolvi- World's first DRI Plant commercially utilizing Coke Oven Gas as a source of reductant for the shaft furnace

In 2014, JSW Dolvi became the world's first DRI Plant to begin commercially utilizing Coke Oven Gas as a source of reductant for the shaft furnace.

Figure 4 -

JSW Dolvi - Existing MIDREX® Plant upgraded to utilize COG

OVERVIEW:

☐ Expansion project to utilize COG

☐ Location: Dolvi, India

☐ Product: CDRI

☐ Reducing Gas: MIDREX® Reformer with natural gas + direct injection of COG

DRIVING FORCES

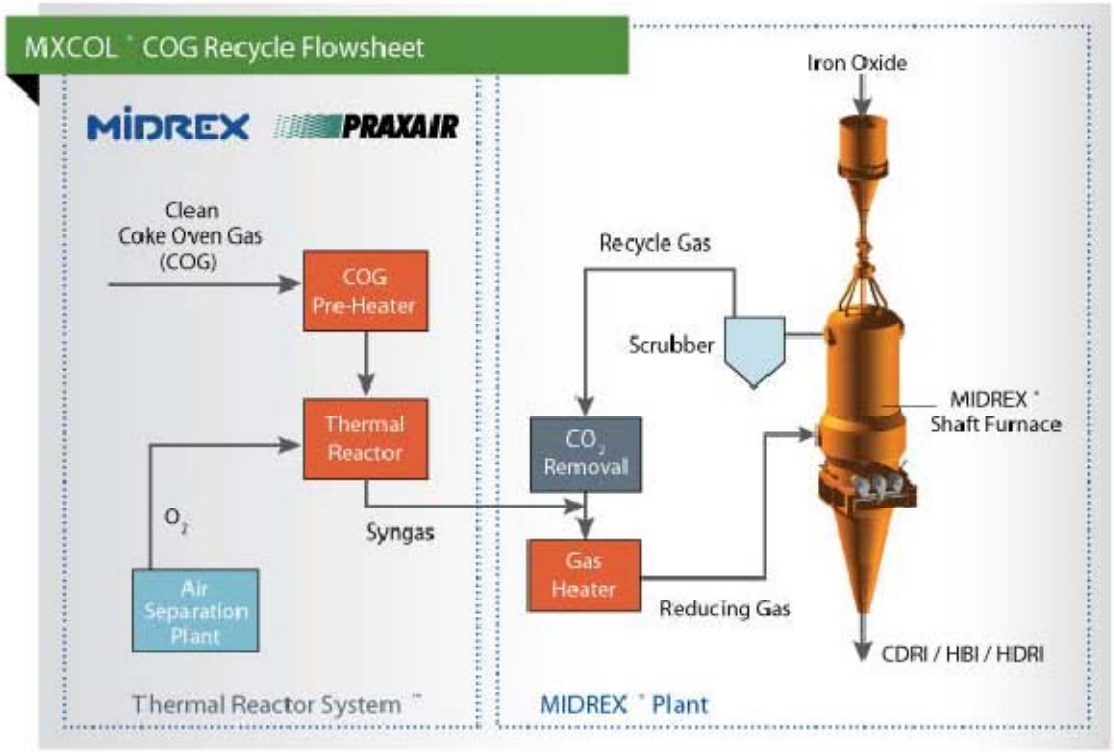
☐ High cost of natural gas

☐ CDRI used with hot metal in an EAF

Strategically located on the coast in the state of Maharashtra, JSW Dolvi 1.0 million tons/year MIDREX® Plant began operation in 1994 producing cold DRI for use on site utilizing 100 % Natural Gas. With the continuing escalation of natural gas price, combined with infrequent availability of consistent gas supply, JSW looked to Midrex for use of coke oven gas, thereby replacing natural gas, to create better sustainability of the plant and overall site. JSW Dolvi decided to use chemical energy of coke oven gas (COG) available from their coke ovens for production of DRI instead of its traditional use of thermal energy as fuels in their plant facilities or power generation.

In the first phase, approximately 20,000 Nm3/hr of COG is being used in the JSW Dolvi MIDREX® DRI Plant. COG is compressed, preheated to approximately 400^{o} C, mixed with reformed gas from Reformer and charged into the MIDREX® Shaft Furnace. This in turn saves natural gas equal to half of COG consumption and produce DRI at a steady rate with same product quality. When more COG would be available, in future, it would be possible to completely replace natural gas by COG using TRS®. TRS® technology reforms the cyclic and long chain hydrocarbons to make the resulting exhaust gas into a usable and efficient reducing gas.
Figure-5, shows the general flow sheet to utilize COG via TRS® for DRI production.

Figure 5 -



MXCOL® with TRS® Flow sheet

JSW Toranagallu - World's Second DRI Plant based on COREX® Offgas

In 2014, JSW at its Toranagallu steel plant, commissioned World's second, a MIDREX® DRI plant which utilises COREX® Export gas from its existing COREX® modules to produce DRI. The MIDREX®DRI plant at Arcelor Mittal, Saldanha, South Africa is the World's first DRI plant based on export gas from their COREX® Module which started its operation in 1999.

JSW has been operating two COREX® modules since 1999. The COREX® export gas was being used for the generation of electrical energy. With consideration to the continually increasing demand for steel in India, JSW Steel decided to utilize this gas for the production of additional iron.

Figure 6 -

JSW Toranagallu- COREX® Export gas based MXCOL® DRI Plant

OVERVIEW

☐ Capacity: 1,200,000 tons/year

☐ Location: Toranagallu, India

☐ Products: HDRI/CDRI

☐ Reducing Gas: COREX® export gas and small quantity of COG

DRIVING FORCES

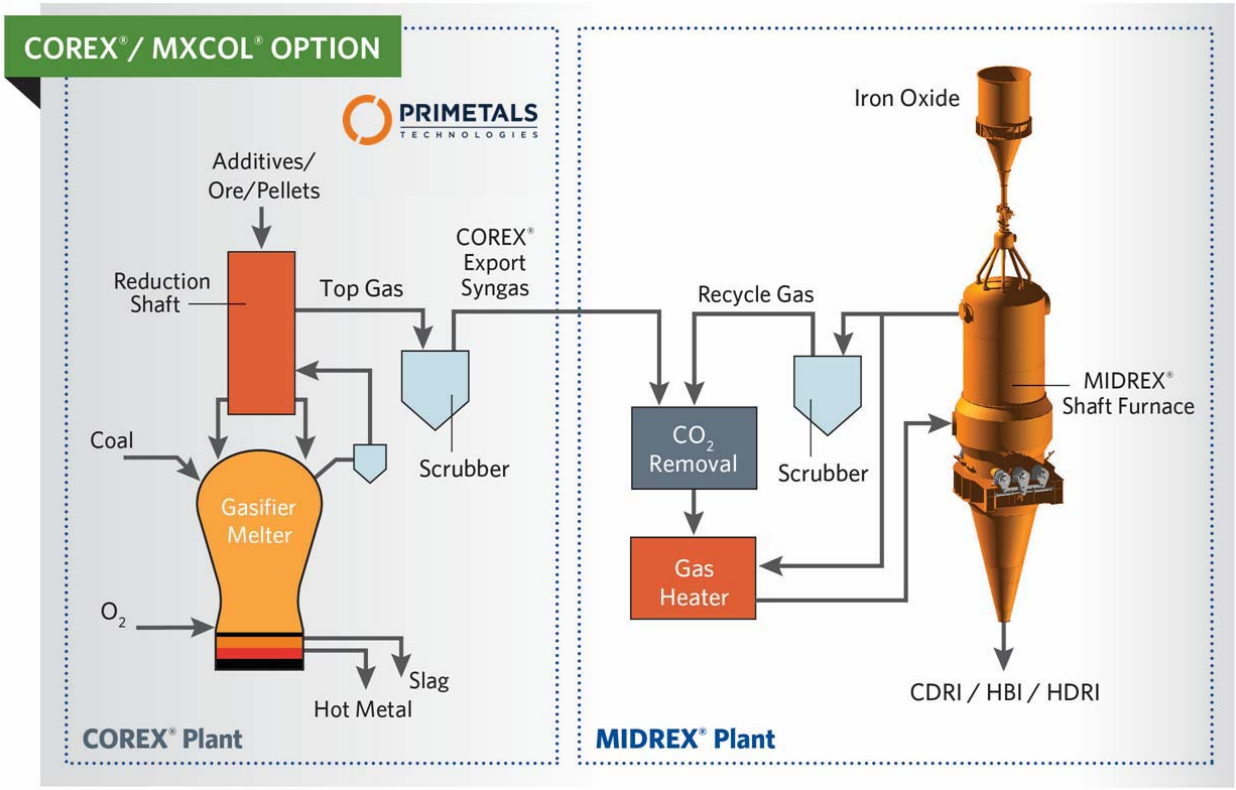
☐ HDRI used with hot metal in an EAF

☐ Utilization of energy sources on site (COREX® Gas/COG)

The COREX® Plant uses a melter/gasifier to simultaneously produce hot metal and export gas. The COREX® export gas and a portion of top gas from the MIDREX® shaft furnace are mixed and compressed, followed by CO_2 removal in a PSA system. The gas is then heated to the required process temperature after which it is then

charged into the MIDREX® shaft furnace for direct reduction of iron oxide feed mix. A portion of the top gas from the DRI plant is used in the steel plant for heating applications and power generation. DRI is supplied to the Electric Arc Furnace (EAF) as HDRI via a Hot Transport System previously developed by Midrex, Primetals (formerly Siemens VAI) and Aumund Fordertechnik or as cold DRI to storage silos. Figure- 7, shows a simplified flow sheet of a COREX® Export Gas based MIDREX® DRI plant.

Figure 7 -



MXCOL® with COREX® Export Gas Flow Sheet

Conclusion:

Midrex has always been at the forefront of technological innovations. The benefits of these innovations are not only meant for new green field plants, but also help existing ones to remain on the cutting edge of DRI technology. Midrex addressed the specific needs of the Indian steel industry, by developing MXCOL® and TRS® to make possible the use of alternative fuels with the MIDREX® shaft Furnace. The plants that came into operation based on MXCOL® flow sheets, in 2014, have proven the new technology. Indian steelmakers can continue to maintain their leadership in the world DRI production by adopting the proven MXCOL® flow sheets to produce DRI without dependency on natural gas.

NOTE : ***This Article was recently presented in the International Seminar on Innovative Technologies for Clean, Green & Automated Steel Plants: A Better Tomorrow, organized by Steel Tech and NIT Durgapur in association with Joint Plant Committee at Kolkata on 10th & 11th September, 2015.***

Reduction of Coal Consumption, TSIL's Experience

Partha Chattopadhyay and GyanaranjanPothal
Tata Sponge Iron Ltd, Joda, Odisha

With long experience of operating coal based rotary kilns for production of Sponge Iron (DRI), Tata Sponge(TSIL) has taken many pioneering steps to break the myth that Coal Based DRI manufacturing process through Rotary Kiln is highly polluting. Tata sponge is trying to apply principles of sustainability and reduce its dependence on natural resources. Iron ore and coal are two primary raw materials for production of Sponge Iron (DRI).In this paper, an attempt has been made to narrate TSIL's experience while trying to reduce coal consumption in kilns. A study was carried out to find suitability of different coals not only for the purpose of enhancement of productivity, but also to reduce specific energy consumption and co_2 generation. By adopting proper utilization of coals having different properties, finding ways and means of utilization of coal fines and through close process control, it is possible to optimize coal consumption and enhance productivity and reduce waste generation. Many similar actions are to be pursued for sustenance of coal based DRI production through rotary kilns.

Operation Philosophy

Out of total raw material cost of around 80-85%, cost of coal is around 40-45%.

Also, carbon is the most important constituent of coal for DRI manufacturing. Higher carbon content of coal is beneficial for the process. Reactivity of coal is also an important consideration. Another constituent of coal is ash which is least desired in the process from the point of view of productivity enhancement and cost reduction. Keeping in view all such requirements, we found that imported coal is the best suited for the process. While sourcing coal from inland mines, we get coal of 0-150mm size and the percentage of fines (-3mm) is varying from 15-30%. While crushing coal to suit the requirement of process, another 10% fines get generated. To maintain quality, productivity and prolonged campaign life, coal fines is rejected and sized coal is fed to kiln. As a result, around 15-20% coal fines get rejected. Due to which, coal consumption increases leading to cost enhancement and sub-optimal usage of a natural resource. One prime reason behind rejection of coal fines from Indian coal is its high ash content leading to higher energy consumption and also accretion formation inside the kiln. As ash content in imported coal is far lower, we tried to utilise the coal fines and optimise consumption in kiln. Properties like High carbon content, good reactivity, low ash content and moderate VM of imported coal have helped to reduce Specific coal consumption leading to reduction of coal cost, enhance bulk density of mixture and increase productivity of kiln. Moreover, a natural resource could be conserved for sustainability.

Methodology adopted

We had been using both Indian and imported coal at different proportions by blending to reduce cost, improve production and productivity. The fines content in Indian washed coal is lower than that of imported coal. However, it contains high ash, reactivity is moderate. Except for very high fines percentage, the chemical properties of imported coal in comparison to Indian coal are far better. While trying to use 100 % imported coal, gradual increase of imported coal in the feed side was done first and use of domestic coal was reduced systematically. The ratio was changed to 50:50 to 60:40, 80:20 and then to 100%. All process parameters were kept under close observation. This experiment was conducted in one kiln initially and then adopted in other kilns. To avoid coal fines rejection, Vibratory screen's size was reduced. To avoid coal starvation in the middle zone, injection coal throw pattern was modified and air profiles at different zones were adjusted and controlled. Gradual alteration of feed coal & injection coal ratio was done as we attempted to attune the process to new regime of operation. The ratio continued to change further. Size of coal also changed to reduce fines generation during crushing.

Result

During the last year, operation key performance indicators(KPI) like feed rate of iron ore for productivity, Specific Consumption of Coal, fines coal quantity fed to kiln per hour and its percentages, FeM of product(quality) and its consistency, campaign life of kilns(middle zone accretion) were monitored .

We recorded reduction in coal consumption 20% and daily production got enhanced from 1146 tpd to 1175 tpd. But, the propensity of accretion formation in the middle zone got increased and our campaign life got reduced from average of 250 days to around 120 days. We are still working to handle this new challenge and confident of coming out as winner.

Fig.No-1 : Graphical presentation of Fines coal use in kilns in %

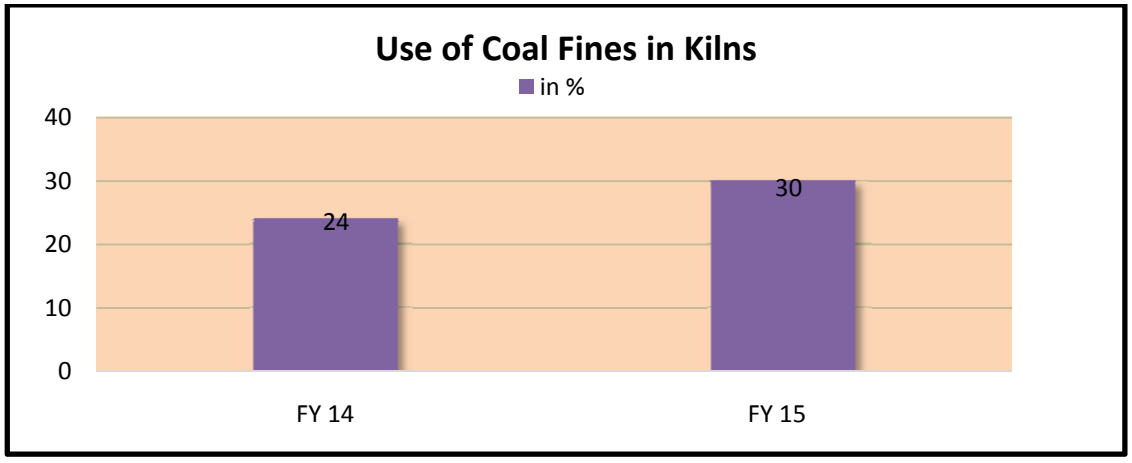


Fig.No-2 : Feed rate of iron ore in MT/Hr

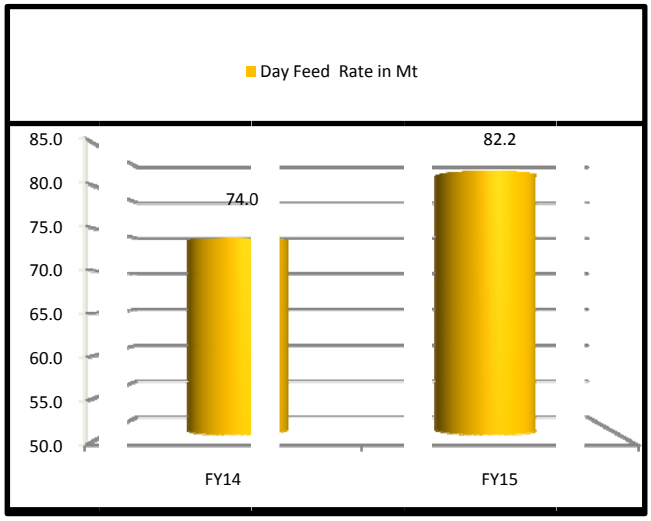
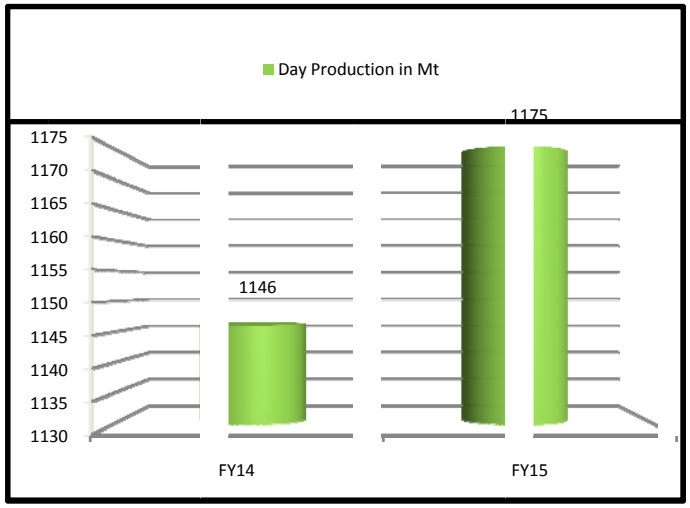


Fig.No-3 : Daily production rate in MT



Conclusion

Sponge iron industry, particularly coal-based rotary kiln process will continue to play a significant role in the growth of iron and steel industry in India. The quantity of steel being produced through secondary route is significant. To sustain in the market place in future, it is important that we continue to innovate ways and means of making the process more energy efficient. Rotary kiln process is also very sensitive to raw material quality. Selection of raw material and methodology of its use is essential to enhance productivity, enhance quality, reduce cost and comply with environment norms.

Industry wide collaboration is required for taking the journey forward and create win-win situation.

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IMPORTANT STATISTICS

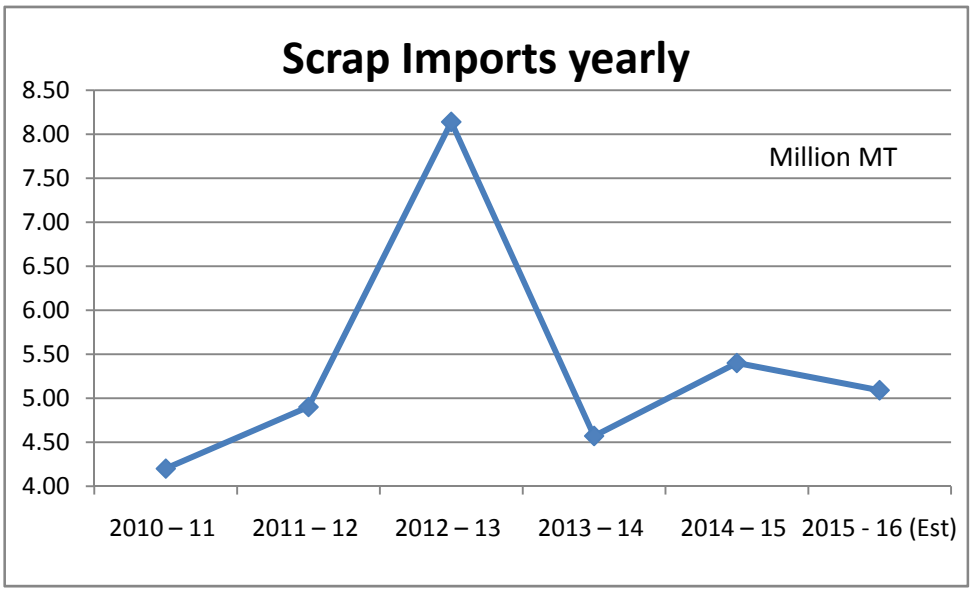
1.Indian DRI/HBI Production

Year	Gas Based(MT)	Coal Based (MT)	Total (MT)
2006-07	5.26	11.01	16.27
2007-08	5.85	14.14	19.99
2008-09	5.28	16.05	21.33
2009-10	6.17	16.82	22.99
2010-11	6.19	17.06	23.25
2011-12	5.15	15.41	20.56
2012-13	3.93	14.74	18.67
2013-14	2.61	15.49	18.10
2014-15	3.14	14.32	17.46

Source: Performance Review, JPC & SIMA

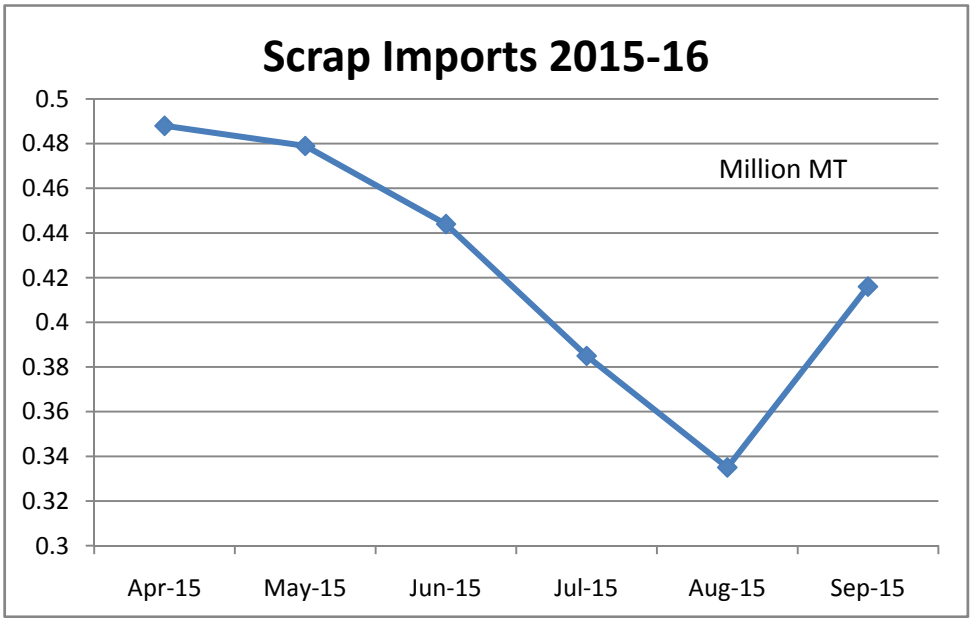
2. Imports of Steel Melting Scrap

Annual scrap imports	
	Million MT
2010 – 11	4.20
2011 – 12	4.90
2012 – 13	8.14
2013 – 14	4.57
2014 – 15	5.40



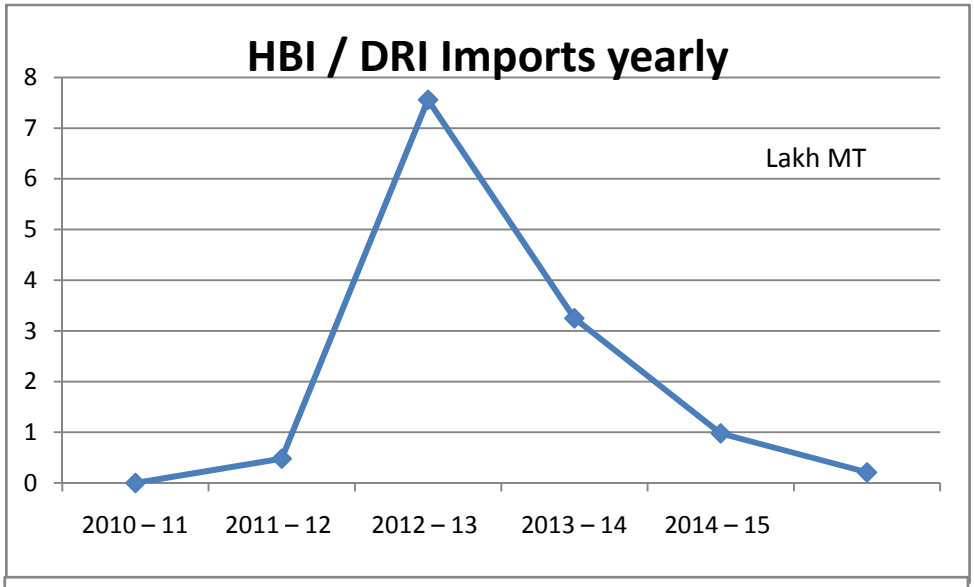
Month wise imports

2015-16	Million MT
Apr-15	0.488
May-15	0.479
Jun-15	0.444
Jul-15	0.385
Aug-15	0.335
Sep-15	0.416
	2.547

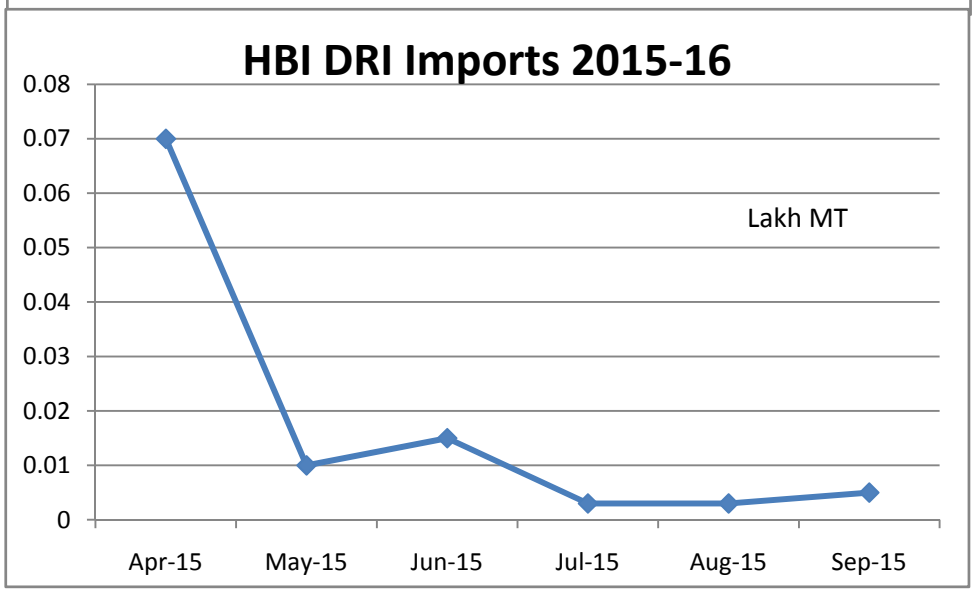


IMPORTS OF HBI / DRI

HBI / DRI Imports	
	Lakh MT
2010 – 11	0
2011 – 12	0.48
2012 – 13	7.56
2013 – 14	3.25
2014 – 15	0.98



2015-16	Lakh MT
Apr-15	0.07
May-15	0.01
Jun-15	0.015
Jul-15	0.003
Aug-15	0.003
Sep-15	0.005
	0.106



3. Import of Steel Billets (non alloy)

Year wise

Year	Month	Quantity MT
2013		**3476**
2014		**21869**
2015		
	Jan	9767
	Feb	21514
	Mar	1987
	Apr	12007
	May	7102
	Jun	9311
	Jul	11446
	Aug	17241
	Sep	4010
2015 Sum		**94384**
Grand Total		**119729**

Country wise

Country	Quantity MT
China	104154
South Africa	10127
QATAR	3245
Nigeria	1280
Canada	641
Belgium	192
United Arab Emirates	65
Kuwait	25
Grand Total	**119729**

Port wise

Port	Quantity MT
Bombay Sea	81308
Mundra	10441
Vizac Sea	9963
Ludhiana	7164
NhavaSheva Sea	3644
Kandla	3000
Cochin Sea	2343
Tuticorin Sea	902
Noida-Dadri (ICD)	544
Chennai Sea	192
Dadri-CGML	163
Tughlakabad	64
Grand Total	**119729**

Import HS Code wise

HS Code	Quantity MT
72071190	
Canada	557
72071190 Total	**557**
72071920	
South Africa	10127
QATAR	3069
Nigeria	1280
Belgium	192
Canada	83
United Arab Emirates	65
Kuwait	25
72071920 Total	**14841**
72071990	
China	9963
72071990 Total	**9963**
72072090	
QATAR	176
72072090 Total	**176**
72249010	
China	5049
72249010 Total	**5049**
72249091	
China	81308
72249091 Total	**81308**
72249099	
China	7834
72249099 Total	**7834**
Grand Total	**119729**

4. Import of Rebars / TMT Imports

Year wise / HS Code wise

Quantity MT	HS Code				
Year	72142090	72283011	72283019	72283029	Grand Total
2013	**476**				**476**
2014	**53426**	**5551**	**21263**	**9842**	**90083**
2015					
Jan	5271		9887	4594	19752
Feb				493	493
Mar	11733	314		603	12650
Apr	11451				11451
May	5800			77	5877
Jun	11701		447		12147
Jul	5467				5467
Aug			22		22
Sep	5509				5509
2015 Sum	**56931**	**314**	**10355**	**5767**	**73367**
Grand Total	**110833**	**5865**	**31618**	**15609**	**163926**

Country wise

Quantity MT	HS Code				
Country	72142090	72283011	72283019	72283029	Grand Total
China	2	5865	31618	15609	53096
Singapore	96638				96638
Thailand	12578				12578
United Arab Emirates	1615				1615
Grand Total	**110833**	**5865**	**31618**	**15609**	**163926**

Port wise

Quantity MT	HS Code				
Port	72142090	72283011	72283019	72283029	Grand Total
Bombay Sea		5865	3735	15609	25210
Chennai Sea	76064				76064
KATTUPALLI	16334				16334
Kolkata Sea	16820				16820
Mundra			18615		18615
NhavaSheva Sea			22		22
Tuticorin Sea	1615				1615
Vizac Sea			9247		9247
Grand Total	**110833**	**5865**	**31618**	**15609**	**163926**

Source : Customs import data

5. List of cancelled coal blocks pertaining to sponge iron

1. API Ispat & Powertech Pvt. Ltd.
2. CG Sponge Manufacturers Consortium Coalfield P.Ltd
3. Electotherm (India) Ltd
4. MSP Steel & Power Ltd.
5. Ispat Godawari Ltd.
6. Shri Nakoda Ispat Ltd.
7. Vandana Global Ltd
8. Shri Bajrang Power & Ispat Ltd
9. Jayaswal Neco Ltd.
10. Jindal Steel & Power Ltd.
11. Nalwa Sponge Iron Ltd.
12. Monnet Ispat & Energy Ltd.
13. Topworth Steel Pvt. Ltd.
14. Prakash Industries Ltd.
15. Sarda Energy & Minerals Ltd.
16. SKS Ispat and Power Ltd.
17. Singhal Enterprises Ltd.
18. Anjani Steel Pvt. Ltd.
19. Bhushan Power & Ispat Ltd.
20. Bihar Sponge Iron Ltd.
21. Gagan Sponge Iron Pvt. Ltd.
22. JSW Steel Ltd.
23. Jai Balaji Industries Ltd.
24. Nilanchal Iron & Power Ltd.
25. Bajrang Ispat Pvt. Ltd
26. Rungta Mines Ltd.
27. Sunflag Iron & Steel Co. Ltd
28. Usha Martin Ltd.
29. BLA Industries Ltd.
30. Kamal Sponge Steel & Ltd
31. B.S. Ispat Ltd.
32. Lloyds Metals & Engineering Ltd.
33. Shree Veerangana Steel Ltd.
34. Adhunik Metaliks Ltd.
35. Adhunik Corporation Ltd.
36. Orissa Sponge Iron Ltd.
37. SMC Power Generation Ltd.
38. Sree Metaliks Ltd.
39. Visa Steels Ltd.
40. Shyam DRI Ltd.
41. OCL India Ltd.
42. Tata Sponge Iron Ltd.
43. Scaw Industries Ltd.
44. SPS Sponge Iron Ltd.
45. Bankura DRI Mining Manufacturers Co. Pvt. Ltd
46. Bhushan Steel Ltd.
47. Rashmi Cement Ltd.
48. Howrah Gas Ltd.
49. Sova Ispat Ltd

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Photo Gallery

1. Photographs of 23rd AGM of SIMA

2. **Photographs of Ministry of Steel Seminar**


JEE
DEEPENDRA KASHIVA
SPONGE IRON MANUFACTURERS
ASSOCIATION(SIMA)
P S


Asian Iron
Metallics and
EAFs 2015
Marina Mandarin Singapore

3. Photograph of Chairman, SIMA with Mr. Peter F Marcus, MD, WSD

4. Photograph of Mitsubishi Delegation in SIMA office

PRESS RELEASE

JOINT PRESS RELEASE

Midrex and Synthesis Energy Systems Expand Global Strategic Alliance for Optimizing MXCOL® DRI Facilities

Midrex to Take the Lead on Fully Integrated Cleaner Coal Gasification-Based DRI Solution

CHARLOTTE / HOUSTON, July 21, 2015 -- Midrex Technologies, Inc. (Midrex), a subsidiary of Kobe Steel, Ltd. (ADR-OTC:KBSTY), and Synthesis Energy Systems, Inc. (SES) (NASDAQ: SYMX) announced the signing of a Project Alliance Agreement that expands their exclusive relationship for integration and optimization of direct reduction iron making (DRI) technology using coal gasification. Midrex will take the lead in marketing, sales, proposal development, and project execution for coal gasification DRI projects as part of the new project alliance. Midrex may also lead the construction of the fully integrated solution for customers who desire such an execution strategy. SES will provide the SES Gasification Technology for each project including engineering, key equipment, and technical services. The fully integrated state-of-the-art gasification-based DRI facility will have total plant guarantees. The agreement includes finalization of an engineering package for the optimized coal gasification DRI solution.

These state-of-the-art facilities will seamlessly combine the industry-leading MIDREX® Process using the MXCOL® configuration with the advanced fluidized bed SES Gasification Technology to create clean syngas from abundant, low quality, locally-sourced coals in order to convert iron ore into high-purity DRI.

"Pairing SES Gasification Technology with Midrex's MXCOL® DRI technology represents the future of cleaner, high quality iron making, especially in regions with limited natural gas resources," said James D. McClaskey, President and CEO of Midrex Technologies, Inc. "Combining these first-in-class technologies opens up tremendous new markets for DRI, giving Midrex increased sales opportunities and a single point source for a complete plant solution for our customers."

SES's proven technology is uniquely capable of cleanly converting even extremely high-ash low-rank coals into valuable syngas for DRI production. This technology along with MXCOL® can enable DRI production in areas such as India that have limited access to low-cost natural gas but abundant low-grade coal resources. - 2 - "We entered this strategic partnership to align SES Gasification Technology with Midrex's MXCOL® due to Midrex's commanding global DRI industry leadership position, brand recognition, technology know-how, and superior project execution track record," said Robert W. Rigdon, President and CEO of Synthesis Energy Systems, Inc. "We are very pleased to take our collaboration to the next level and embark on this fully integrated and optimized product offering. Together, we are creating a gasification-based DRI solution that is

capable of cleanly converting virtually any coal, including low-rank lignite, coal wastes, and coal with high ash and/or high moisture content, into syngas for DRI steelmaking that will enable Growth with Blue Skies."

Midrex and SES rolled out their marketing alliance in May 2014 following the successful early engineering co-development effort of the joint technologies. That effort provided results leading the partners to believe that the combined cleaner, efficient and economic product will have widespread application, especially in gas-short regions with low quality, low cost coal, which comprise more than 50% of the world's coal resources.

"Meeting the world's evolving environmental needs to make top-grade DRI products by best utilizing local coal sources and raw materials is an optimum solution unique to our combined, commercially robust technologies," said Mr. McClaskey. "There is no other combined product offering like this available in the steel industry. We forecast strong growth for our partnership with SES and the industry as a whole. The broadening of new and low cost DRI production in developing regions with natural gas limitations is a key driver that will enable this growth where demand is highest."

About Midrex Technologies, Inc.

Midrex Technologies, Inc., a wholly owned subsidiary of Kobe Steel, is an international process technology company providing steelmakers with commercially proven solutions for greater profitability and has been the leading innovator and technology supplier for the direct reduction of iron ore for more than 40 years. The company offers eco-friendly technologies for iron making that provide high productivity, outstanding product quality, and cost competitiveness. Midrex has built its foundation upon the MIDREX® Direct Reduction Process that converts iron ore into high-purity direct reduced iron (DRI) for use in steelmaking, iron making, and foundry applications. Each year, MIDREX® Plants produce about 60 percent of the world's DRI. For more information, visit: www.midrex.com.

About Synthesis Energy Systems, Inc.

Synthesis Energy Systems (SES) is a Houston-based technology company focused on bringing clean high-value energy to developing countries from low-cost and low-grade coal and biomass through its proprietary gasification technology based upon U-Gas®, licensed from the Gas Technology Institute. The SES Gasification Technology enables Growth With Blue Skies, and greater fuel flexibility for both large-scale and efficient small- to medium-scale operations close to fuel sources. Fuel sources include low-rank, low-cost high ash, high moisture coals, which are significantly - 3 - cheaper than higher grade coals, many coal waste products, and biomass feedstocks. For more information, please visit: www.synthesisenergy.com.

SES Forward-Looking Statements

This press release includes "forward-looking statements" within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. All statements other than statements of historical fact are forward-looking statements. Forward-looking statements are subject to certain risks, trends and uncertainties that could cause actual results to differ materially from those projected. Among those risks, trends and uncertainties are the ability of our ZZ joint venture to effectively operate XE's methanol plant and produce methanol; our ability to successfully expand the ZZ joint venture through our partnership with Saikong; the ability of our project with Yima to produce earnings and pay dividends; our ability to develop and expand business of the Tianwo-SES joint venture in the joint venture territory; our ability to successfully partner our technology business; our ability to develop our power business unit and marketing arrangement with GE and our other business verticals, including DRI steel, through our marketing arrangement with Midrex Technologies, and renewables; our ability to successfully develop the SES licensing business; events or circumstances which result in an impairment of assets, including, but not limited to, at our ZZ Joint Venture; our ability to reduce operating costs; our ability to make distributions and repatriate earnings from our Chinese operations; our limited history, and viability

of our technology; commodity prices, including in particular methanol, and the availability and terms of financing; our ability to obtain the necessary approvals and permits for future projects; our ability to raise additional capital, if any, and our ability to estimate the sufficiency of existing capital resources; the sufficiency of internal controls and procedures; and our results of operations in countries outside of the U.S., where we are continuing to pursue and develop projects. Although SES believes that in making such forward-looking statements our expectations are based upon reasonable assumptions, such statements may be influenced by factors that could cause actual outcomes and results to be materially different from those projected by us. SES cannot assure you that the assumptions upon which these statements are based will prove to have been correct.

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To make Hon'ble Prime Minister's initiative of "Make in India" a grand success, it is imperative for the Indian steel industry to grow. And for sustainable growth of Indian steel industry, it is imperative for Indian DRI industry to grow.

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