

Iron Ore Market Developments 2013 - 2014

CRU Ryan's Notes 7th Metallics Meeting

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Dr. Joseph Poveromo

Raw Materials & Ironmaking Global Consulting

1992 Easthill Drive, Bethlehem, PA 18017

610 974 9553 610 442 3527 cell

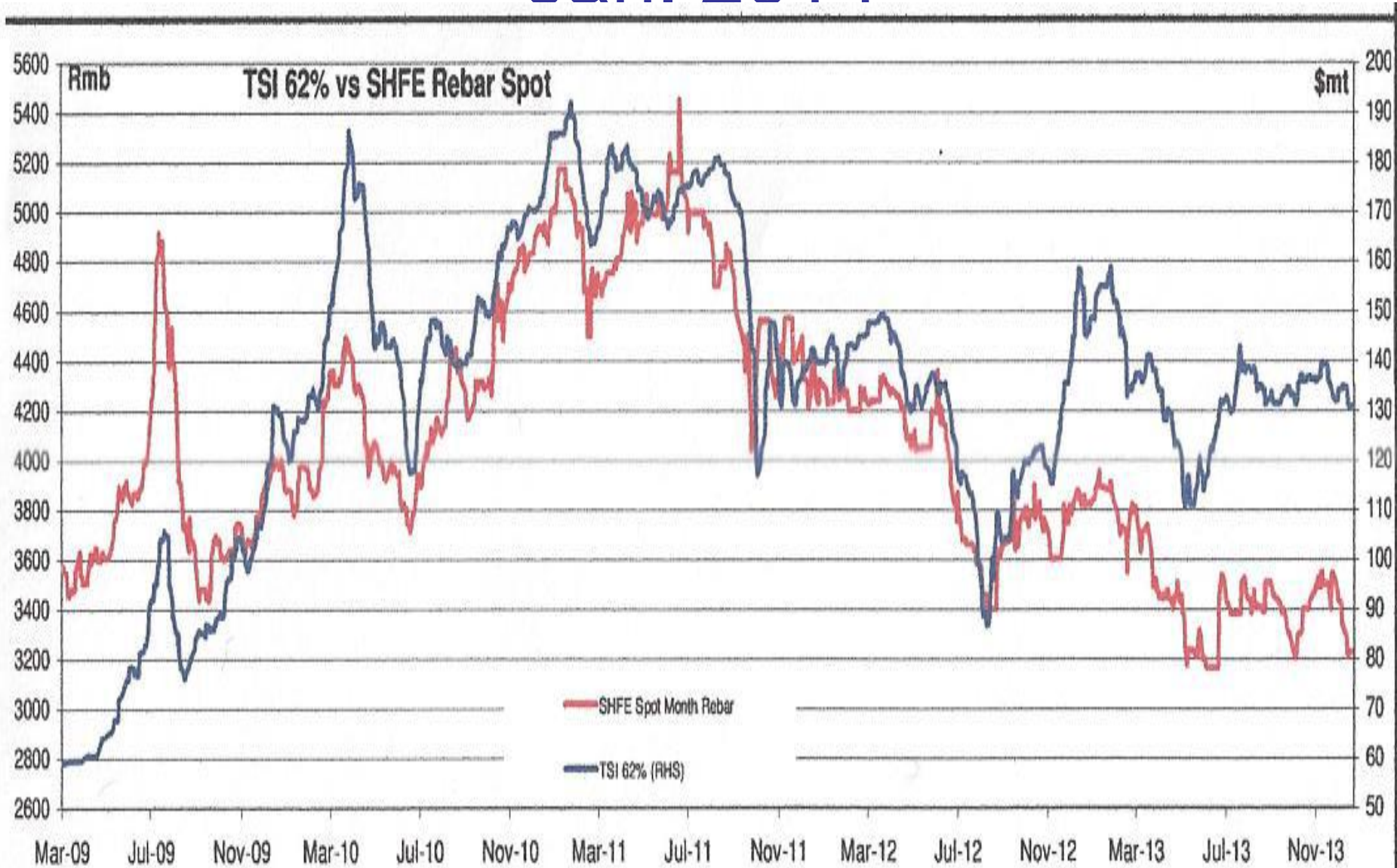
Joe.poveromo@rawmaterialsiron.com

Topics

- **Iron ore pricing 2013-2014**
- **Iron ore pricing 2014 onward**
- **NAFTA iron ore market**
- **DR grade pellets for NAFTA DRI projects**
- **Other NAFTA metallics market issues**

Iron ore pricing 2013-2014

Iron Ore and Steel Prices through Jan. 2014



Iron ore pricing 2013-2014

- **Jan 2013 pricing of 160 \$/ton not expected to be maintained due to weak steel prices,**
- **Ore prices followed steel prices down to \$ 110/ton by 2Q13 before rebounding to plateau of \$ 130-140 for rest of year,**
- **Steel prices did not rebound so gap between ore, steel prices gets wider,**
- **Pellet premium: 25 to 40 \$/ton**

Iron Ore, Freight, Metallics Pricing

•	Jan 2014	2013 avg.	2012 avg.	2011 avg.
Iron ore fines				
Spot 62 % Fe CFR China	131	136	129	166
Iron ore lump				
Spot 62 % Fe CFR China	149	148	136	179
Contract				
fines FOB Aust, 62 % Fe PB	125	130	124	161
fines FOB Brazil, 65 % Fe	117	123	139	185
Spot freight rates				
Australia-China	7	9	8	9
Brazil – China	20	21	20	22
Pig iron CFR NOLA	420	412	438	516
HBI CFR NOLA	345	357	389	419

Source: CRU

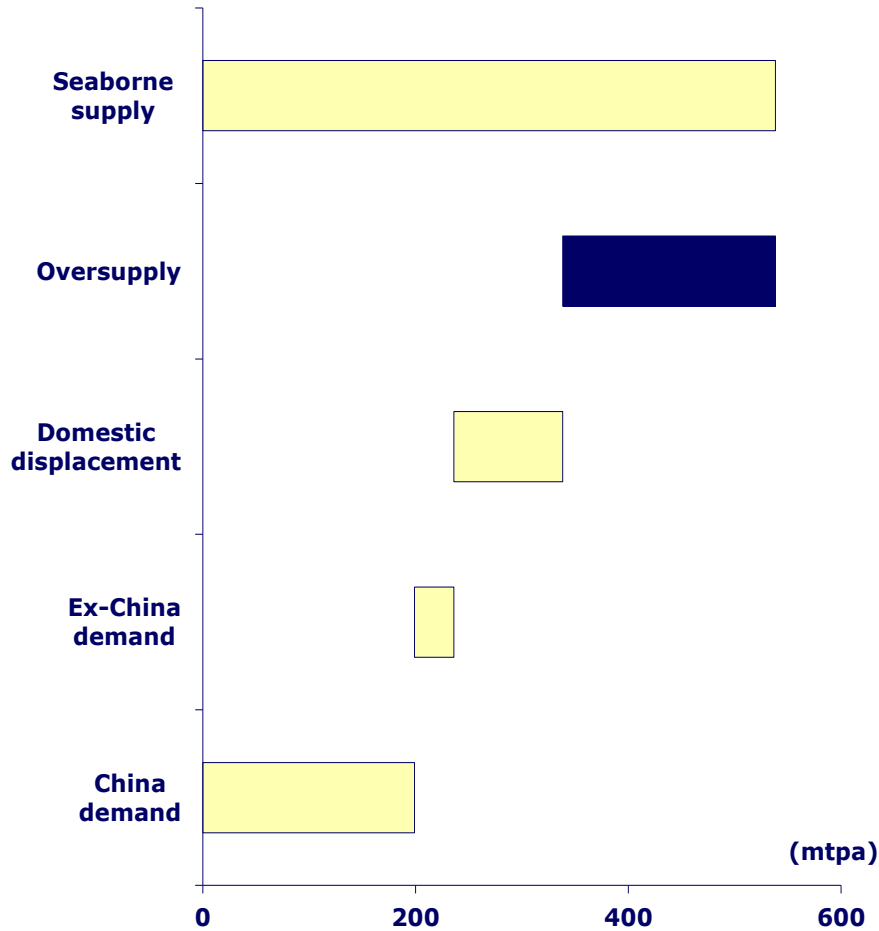
Iron ore pricing 2014 onward

Iron ore pricing 2014 onward

- **Iron ore expected to go into oversupply when bulk of new projects come on stream,**
- **But when????? We keep deferring the date!**
- **Reasons?**
 - **continued project delays,**
 - **moderation by “Big Three”**
 - **supply interruptions: export restrictions by India, Indonesia, others**

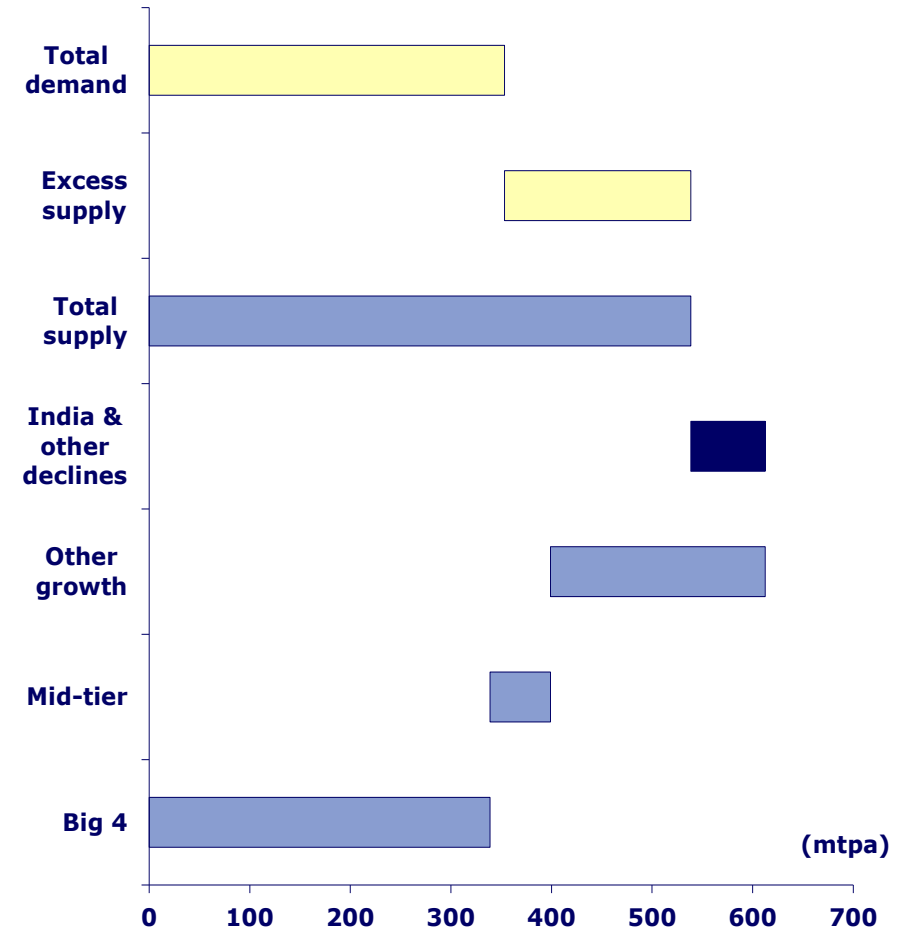
More projects need cancelling to avoid surplus

200mt+ seaborne oversupply in 2016 vs 2012



Source: Company reports, CLSA Asia-Pacific Markets

Growth from big four alone enough to meet demand



Source: Company reports, CLSA Asia-Pacific Markets

Iron ore pricing 2014 onward

Iron ore supply/demand balance unknowns:

- **Iron Ore project completions/cancellations,**
- **China iron ore production: large scale projects to upgrade low grade ores at Inland sites,**
- **Withdrawal of marginal supplying countries: USA, Mexico, SE Asia, etc**

NAFTA iron ore market

NAFTA iron ore pellet market

NAFTA Blast Furnace Pellet Balance

2012

Company	Pellet Demand	Equity Supply	Cliffs	IOC	AMMC	Brazil
AHMSA	4.6	4.1	0.5			
ArcelorMittal	20.9	12.7	8.0	0.2	2.2	
AK	4.9		1.4	2.0	1.5	
Essar Algoma	3.5		3.5			
RG Steel	1.3		0.6	0.4		0.3
SeverstalNA	2.9		2.9			
USSteel	21.9	20.7	1.2			
Available for export/DR			0.9	7.1	5.1	
Total	60.0	37.5	19.0	9.7	8.8	

Note Dofasco AMMC also included in ArcelorMittal equity supply

NAFTA iron ore pellet market

Changes in BF Pellet Demand

- Decreases with liquidation of RG Steel, Shutdown at USS Hamilton

Increased BF Pellet Supply

- AK/Magnetation, 3.5 MTPY **4Q14**
- Essar Minnesota, 4.1 to 7.0 MTPY **??**
- **→ BF Pellet Oversupply;**
 - need to supply DR market
 - need to move Canadian suppliers off shore

DR grade pellets for NAFTA DRI projects

DR grade pellets for NAFTA DRI projects

- **DRI plants in Gulf Coast, Trinidad best served by seaborne suppliers due to logistics:**
Canada (IOC,AMMC), Brazil (Samarco, VALE), Sweden (LKAB)
- **Potential Upper Midwest DRI projects best served by emerging USA DR pellet suppliers:**
Cliffs (Northshore, UTAC), Essar Minnesota, USS (Minntac, KeeTac), AK/Magnetation

Other NAFTA metallics market issues

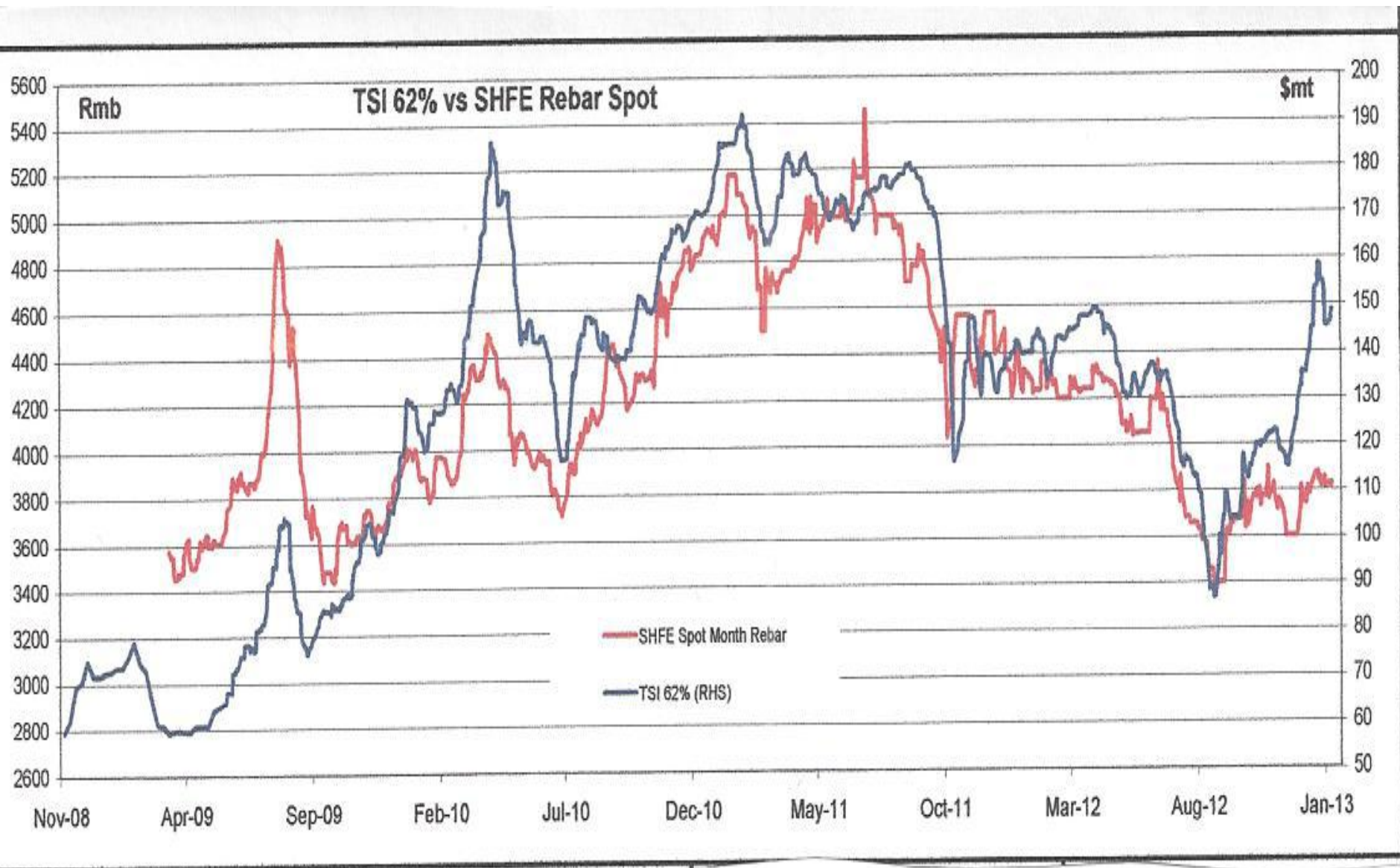
Thank you for your attention!

Appendix

Topics January 2013 Presentation

- Iron Ore Price Roller Coaster in 2012/13
- Impact of Above and Global Steel Events on Iron Ore Projects
- Global Pellet Market – Blast Furnace, Direct Reduction
- Impact of Low Natural Gas Prices on NAFTA Ironmaking, Iron Ore

Iron Ore Price Roller Coaster



Iron Ore Price Roller Coaster in 2012/13

- Price range of 160 – 180 \$/ton (62 % Fe fines cfr China) in 2011 dropped to 130 – 150 range in 1H 2012
- Sharp price drop in 3Q12 plunged through “predicted floor price” of 120 \$/ton (based on costs of smaller, higher cost Chinese mines,
- Price dropped to \$ 89/ton before climbing back to 130 \$/ton by year end 2012
- Current pricing of 160 \$/ton may not be maintained due to weak steel prices

Iron Ore Price Roller Coaster in 2012/13

Impact on ironmaking, iron ore projects

- Re evaluation of iron ore projects globally,
- Slowdown of some NAFTA iron ore projects: Bloom Lake, Baffinland, Essar Minnesota
- Re think by some steel companies on iron ore investment: ArcelorMittal selling 15 % of Mines Canada

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Source: CRU

Global Pellet Market – Blast Furnace, Direct Reduction

ROLE OF IRON BEARING MATERIALS (PELLETS, SINTER, LUMP ORE) IN GLOBAL STEEL PRODUCTION

Year	1991	2001	2003	2005	2007	2008	2009	2010
Pig iron production , MT	500	580	650	780	940	927	900	1031
DRI, MT	19	40	49	55	63	68	64	69
Pellet production -global	225	238	285	310	325	313	215	325
China	5?	27	35	58	94	96	110	>110

- 1.5 tonnes of iron ore = 1 tonne of pig iron/DRI
- pig iron = mainly blast furnace
- DRI = 75 % by shaft furnace (mainly pellet based)
- **2007: sinter, >900 MT; pellets 325 MT, lump ore >200 MT**
- **900 MT of sinter needs nearly 900 MT of iron ore fines**

Pellet Market

- Serves **both** blast furnace and direct reduction sectors
- **More volatile than fines, lump ore** market: in downturns sinter capacity is maintained, pellet consumption is reduced
- Downturns also reduce sale of merchant HBI, DRI

Blast Furnace Ironmaking

- **High Sinter Burdens** – pellets/lump ore as supplement - Asia
- **Moderate to High Sinter Burdens** – pellets as complement - Europe
- **All Pellet burdens** – North America, Scandinavia

World Blast Furnace Iron Unit Sourcing 2010/2011

Region	Annual Production MT	Pellet				Lump	
		Consumption kg/T	Equity MT	Market MT	Consumption		
					MT	kg/T	MT
NAFTA	49	1317	64	39	25	15	0.7
Europe	107	509	54	14	41	108	12
China	630	236	149	115	34	135	85
Rest of World	308	230	71	45	26	198	61
totals	1094	309	338	213	126	145	158

sinter estimate = 1500 - 309 - 145 = 1046 kg/T

World DRI Capacity 2013 2014 includes projects

Region	Annual Production (KT)	Pellet				Lump	
		Consumption	Equity	Market	Consumption		
		kg/T	KT	KT	kg/T	KT	
NAFTA, Trinidad	12.1	1442	17.4	11.0	6.5	5.0	0.1
AM Hamburg	0.4	1420	0.5	0.5	0	0	0
Egypt, Libya	10.0	1392	13.9	0.0	13.9	50	0.5
Persian Gulf	23.7	1417	33.5	17.2	16.3	36	0.9
Malaysia, Indonesia	5.4	1379	7.5	0.0	7.5	71	0.4
India, Pakistan	31.7	788	25.0	21.6	3.4	691	21.0
South America	10.8	830	9.0	6.6	2.4	328	3.6
S Africa Russia	6.6	1180	7.8	7.7	0.1	282	1.9
	101	1137	115	65	50	280	28

World (ex China) Pellet Capacity by Region				MTPY
		Capacity	Equity	Market
NAFTA		99.3	58.6	40.7
Brazil		64.4	10.5	53.9
Other South America		17.8	12.7	5.1
Sweden		19.4	0	19.4
Other Europe		6.9	6.9	0
CIS		73.3	12.9	60.4
MENA ex Iran		21.0	2.3	17.7
Iran		24.7	12.3	13.4
India		24.3	16.8	9.5
Japan, Australia		7.2	4.5	2.7
totals		358.3	137.5	222.8

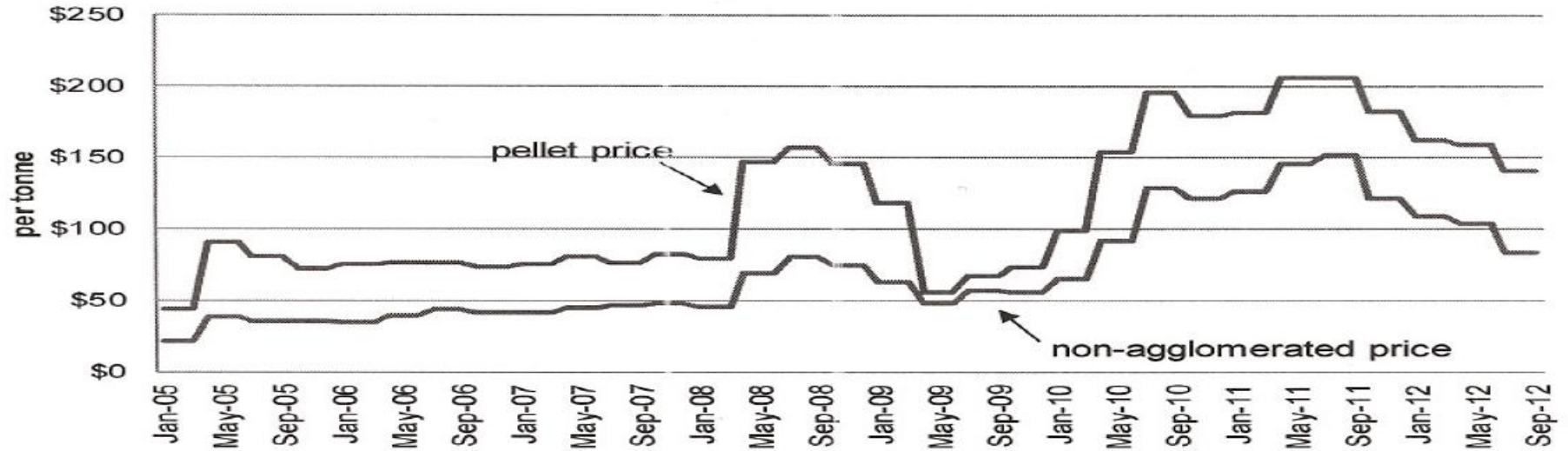
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Global Pellet Supply/Demand

- Global pellet consumption (both BF and DR) outside of China was 293 MT in the 2010/2011 period. We estimate the pellet imports into China at about 34 MTPY, bring total pellet consumption (not including equity pellet consumption in China) up to 327 MTPY.
- Compare this to above world pellet capacity of 358 MTPY. Even if 2010/2011 pellet consumption does not represent full recovery from the GFC, current world pelletizing capacity is adequate;
- Expect adding 31 MTPY of pellet capacity outside of India,China.
- China pellet capacity is now estimated to exceed 210 MTPY
- All of the above suggests there is little or no room for additional merchant pellet plant capacity not specifically targeted to firm, dedicated off takers.

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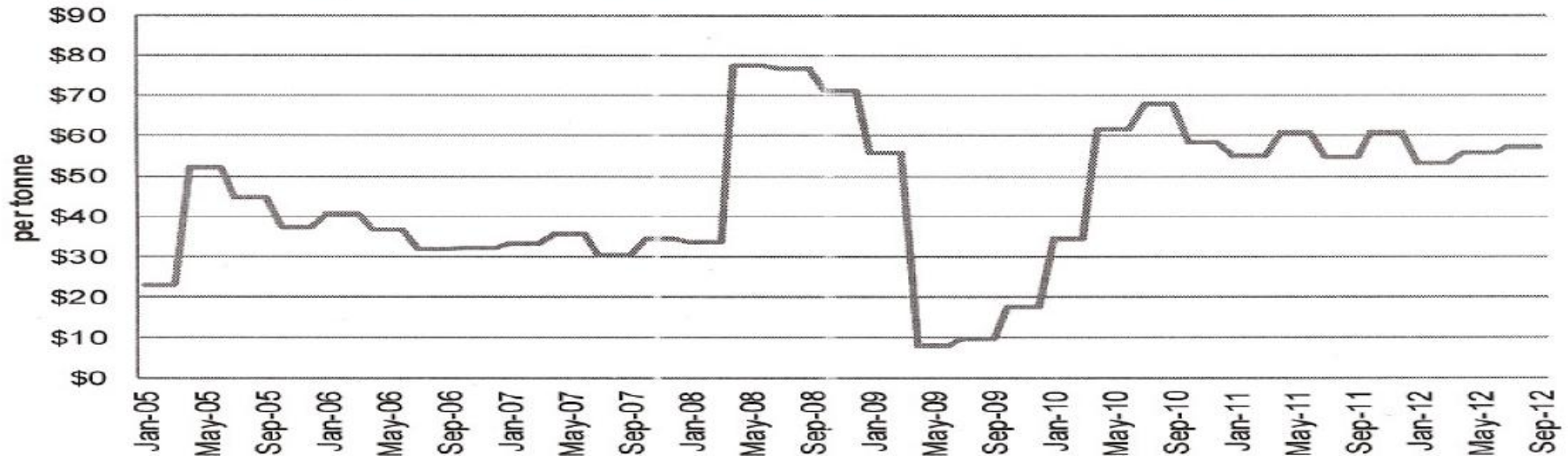
Vale Prices FOB Brazil



Source: company reports

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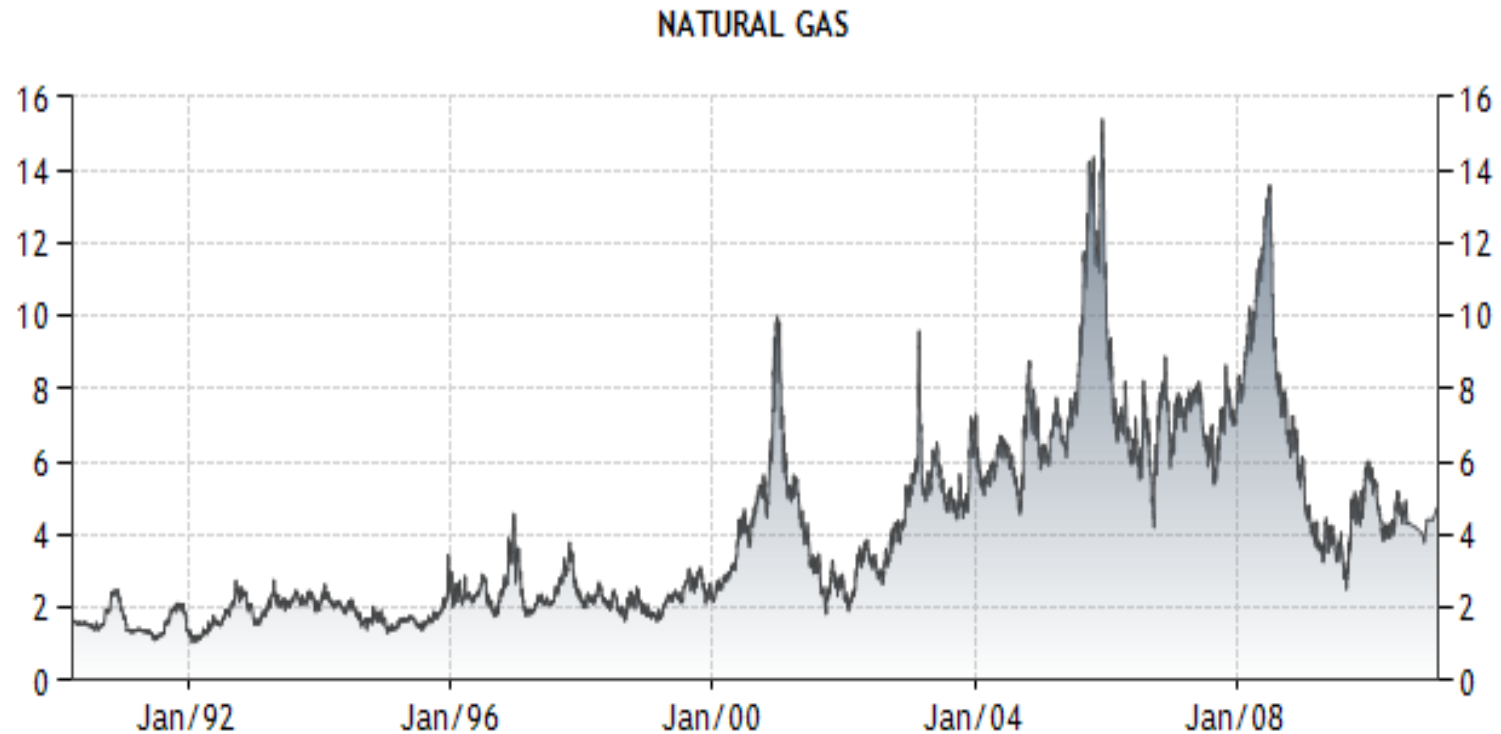
Spread: Vale Pellet less iron ore



Source: company reports

Effect of Decreasing Natural gas Prices on Ironmaking Technology Selection,

- Mainly a USA phenomena:



Gas Based Shaft Furnace Direct Reduction

- Now economically feasible in USA,
- Nucor building 2.5 MTPY DRI plant in Louisiana to ship DRI to existing EAF plants; planning second plant;
- SeverstalNA has been planning DRI plant,
- Other EAF flat rolled mini mills studying gas based DRI projects

Gas Based Shaft Furnace Direct Reduction

- Major initial impact:

elimination of imported merchant pig iron
(Brazil, Russia, Ukraine)

No further expansion of coal based DRI,
hot metal or pig iron nugget projects in
USA,

IDI, Mesabi Nugget plants will continue
but further plants less likely

Topics **January 2012 Presentation**

- **Overall iron ore supply/demand outlook**
- **Constraints (physical, financial, political, etc) on developing new projects**
- **Summary of new capacity by region and type**
- **Impact of New Capacity on Pricing**
- **New Ironmaking Technology: Effect on Iron Ore Demand**
- **North American iron ore supply/demand**
- **Iron ore for metallics production**