

# World Steel Dynamics



Riding the Wave

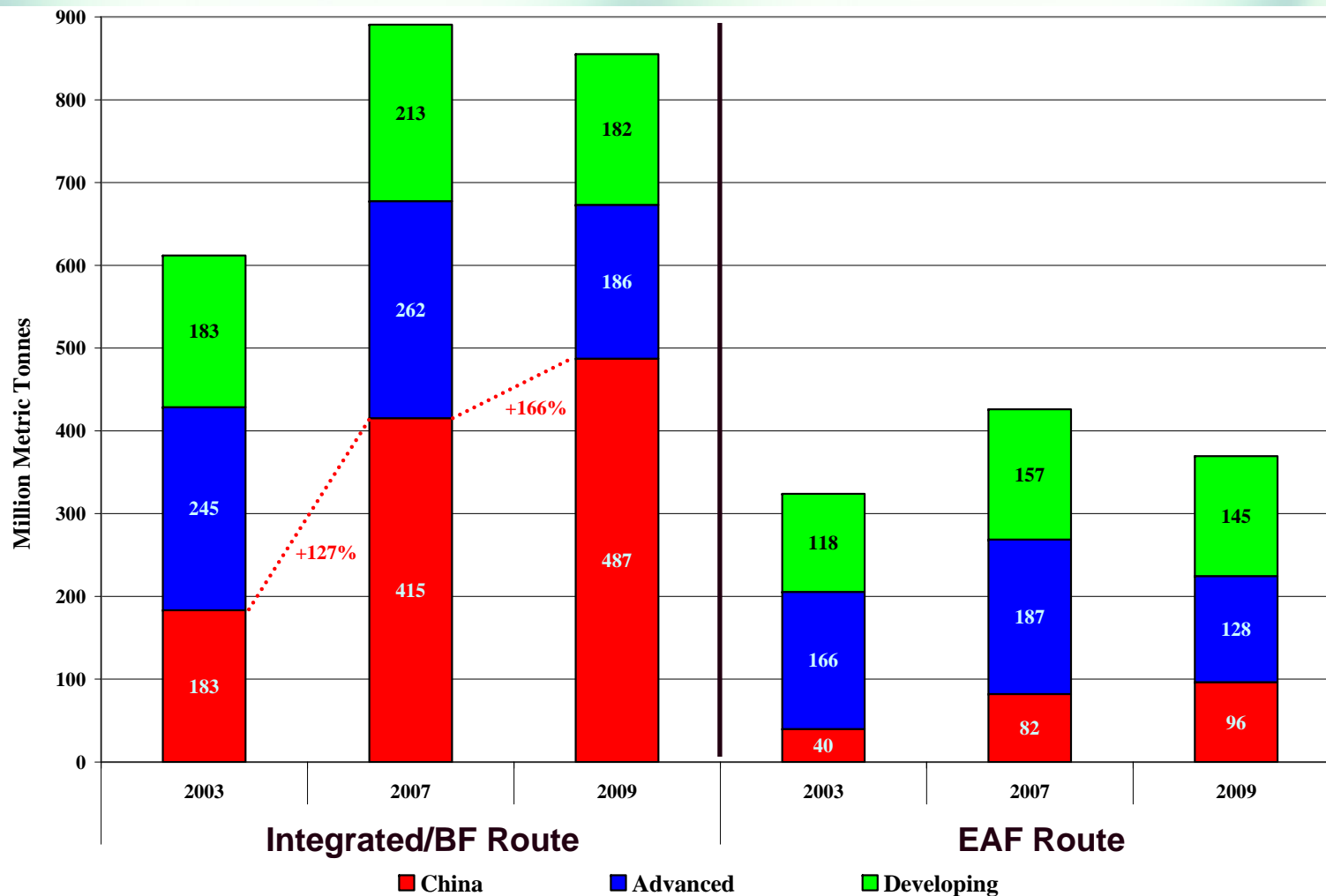
*“Turning Dirt  
to Gold”*

*Prepared for:  
SME-NY Section*

April 29, 2010

- **Steel Industry Trends**
  - Production Demographics
  - Pricing Trends
  - Production Outlook
- **Impact on Raw Materials**
  - Iron Ore
  - Steel Scrap
  - Coking Coal
  - Cost Curve
- **North American Iron Ore**
  - Proposed Projects
  - N.A. Cost Structure
  - Big-4 planned capacity investment

# World Steel Production by Process China Driving the “Bus”



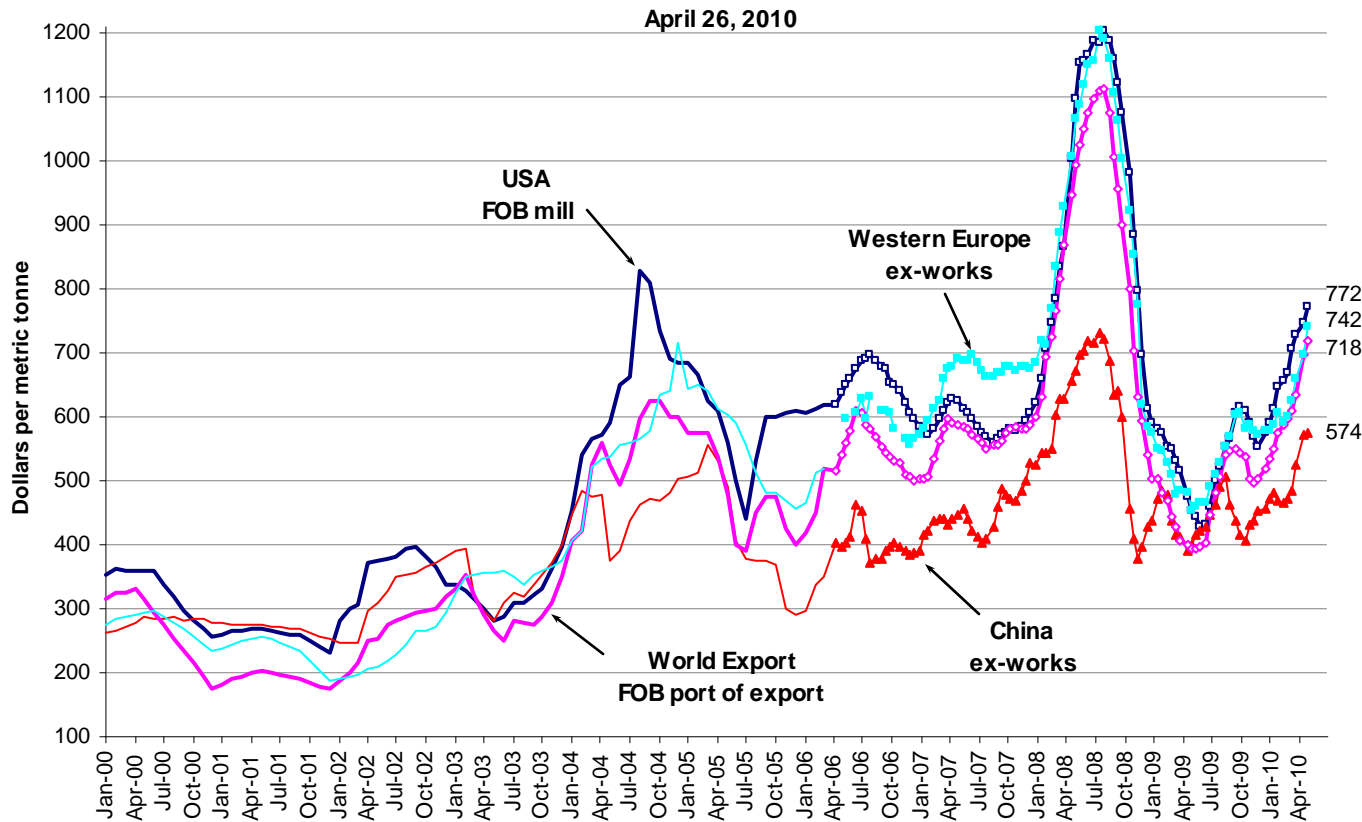
China's prodigious and rapid growth via the BF/Integrated route has changed the landscape of global steel production

## Hot-Rolled Band Spot Prices

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

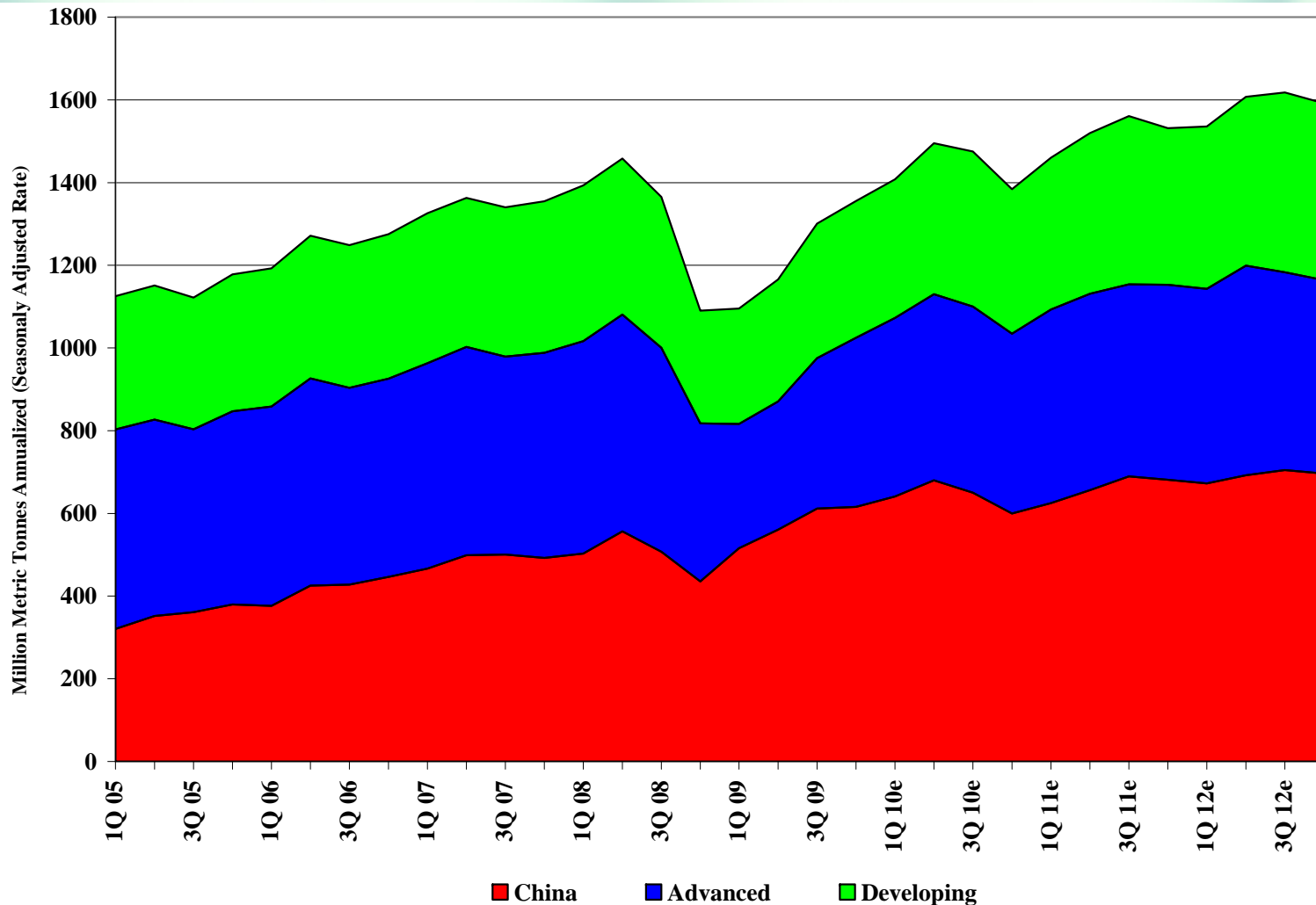
### USA, China, Western Europe and World Export

(WSD's PriceTrack data, Jan. 2000 - March 2006; SteelBenchmarker data begins April 2006)



Steel prices have become a “rollercoaster” of ups and downs, driven by the rapid industrialization of developing-world economies

# Global Steel Production Forecast by Region

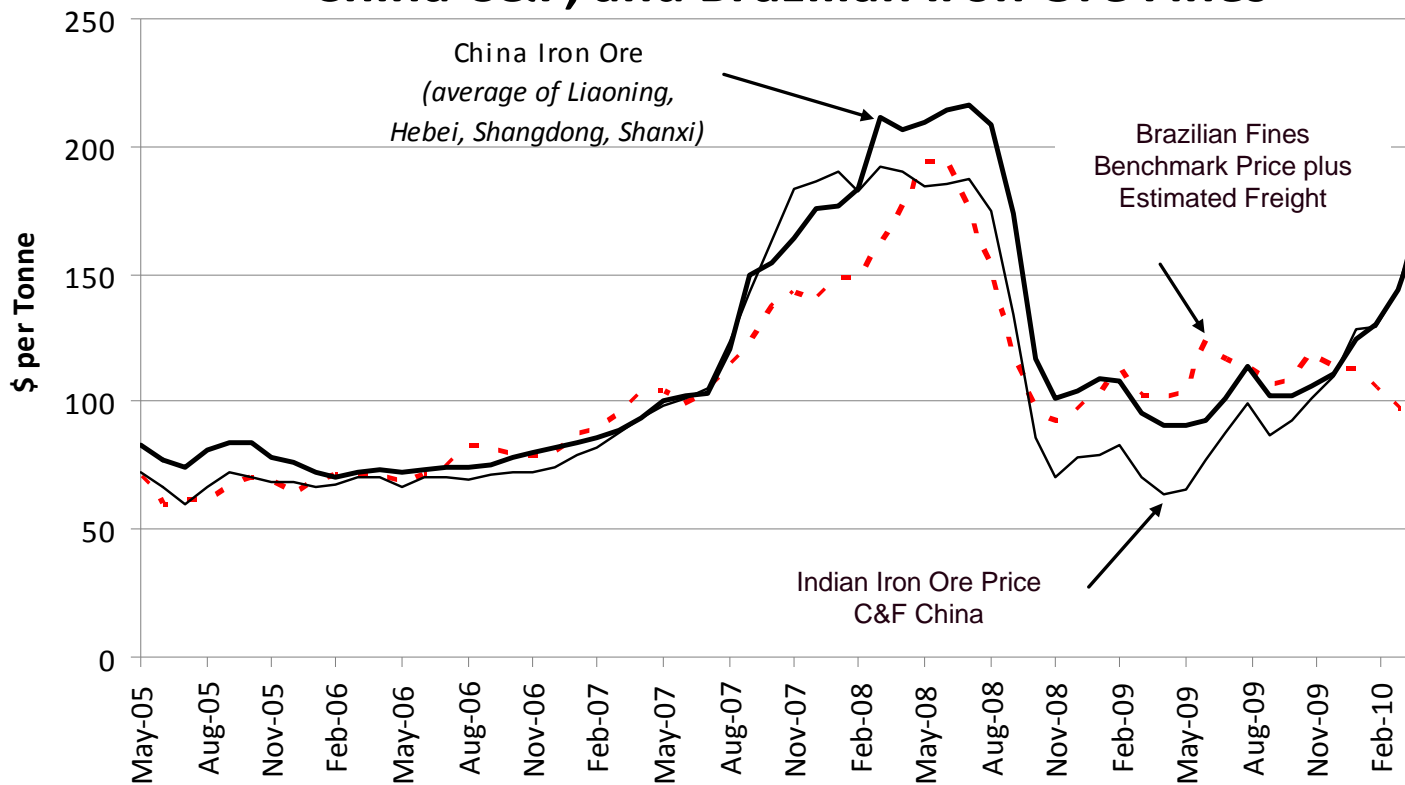


**The outlook for global production growth remains positive, despite slower %-growth in China after 2011.**

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# Spot Iron Ore Prices in China Up over 150% from May 2009

## China Iron Ore, Indian Iron Ore Export Price to China C&F, and Brazilian Iron Ore Fines



Source: WSD Estimates

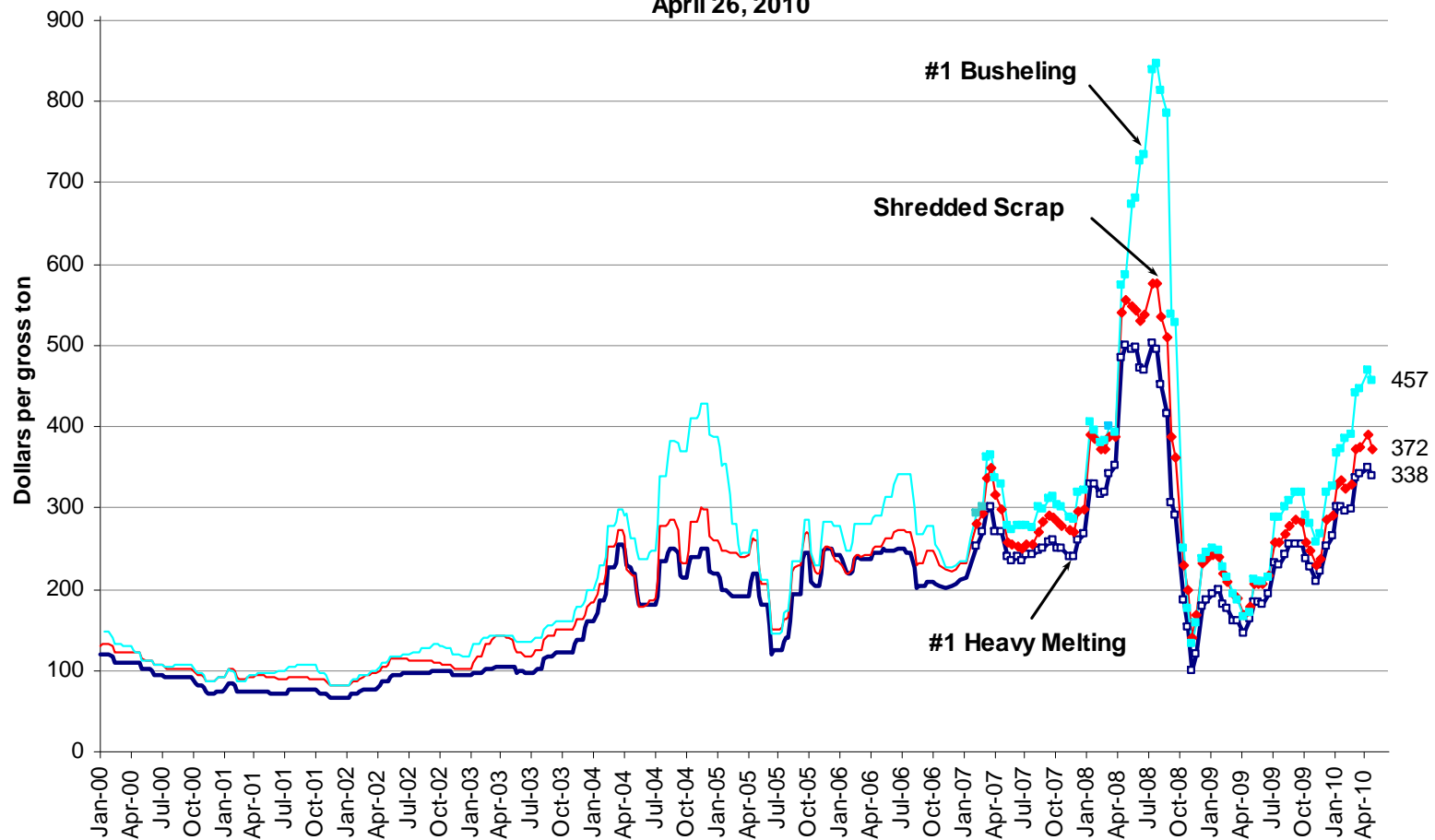
The discontinuation of annual benchmark pricing will add to steel-maker's cost volatility and, in turn, to steel price volatility

**USA Scrap Prices**  
[www.steelbenchmarker.com](http://www.steelbenchmarker.com)

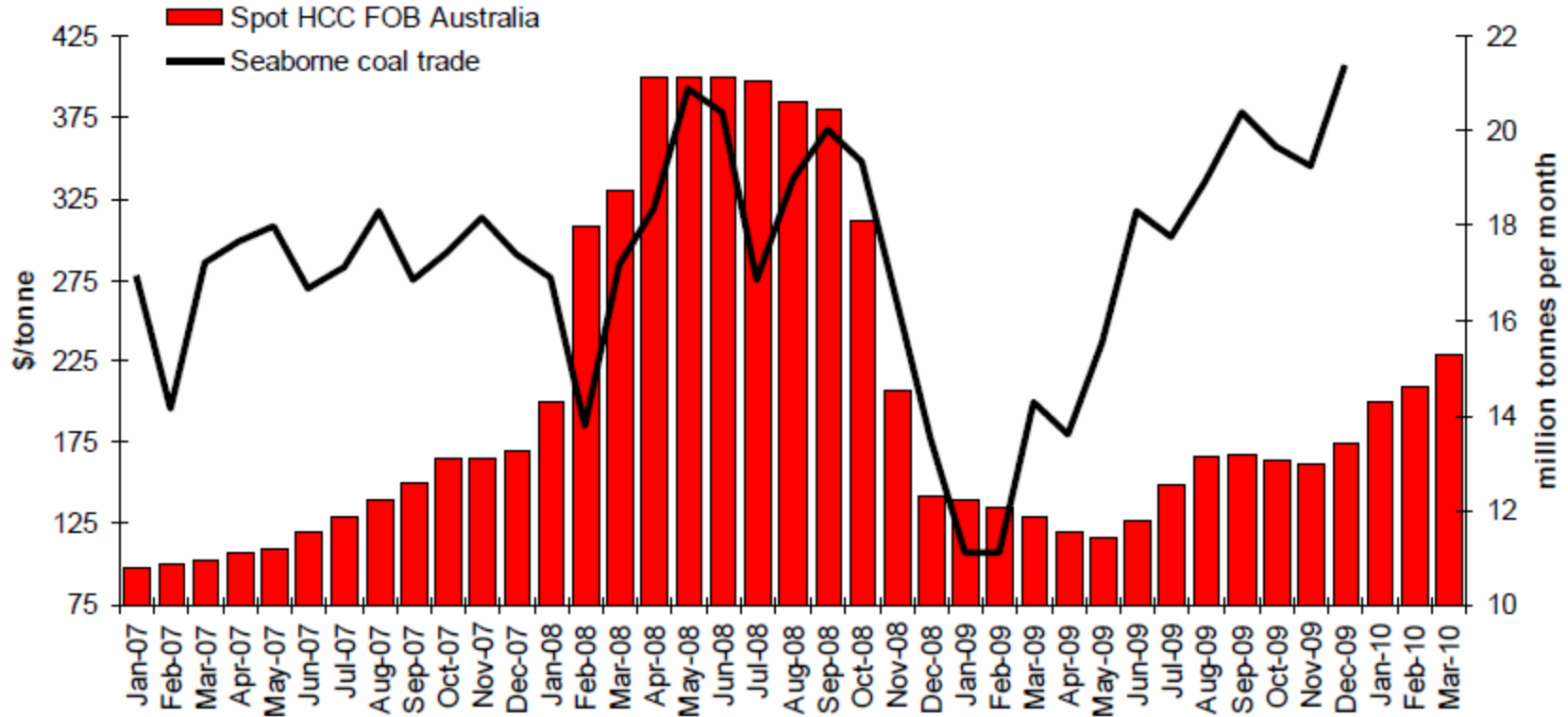
**USA, delivered to steel plant**

(AMM scrap price data, Jan. 2000 - Jan. 2007; SteelBenchmarker data begins Feb. 2007)

April 26, 2010



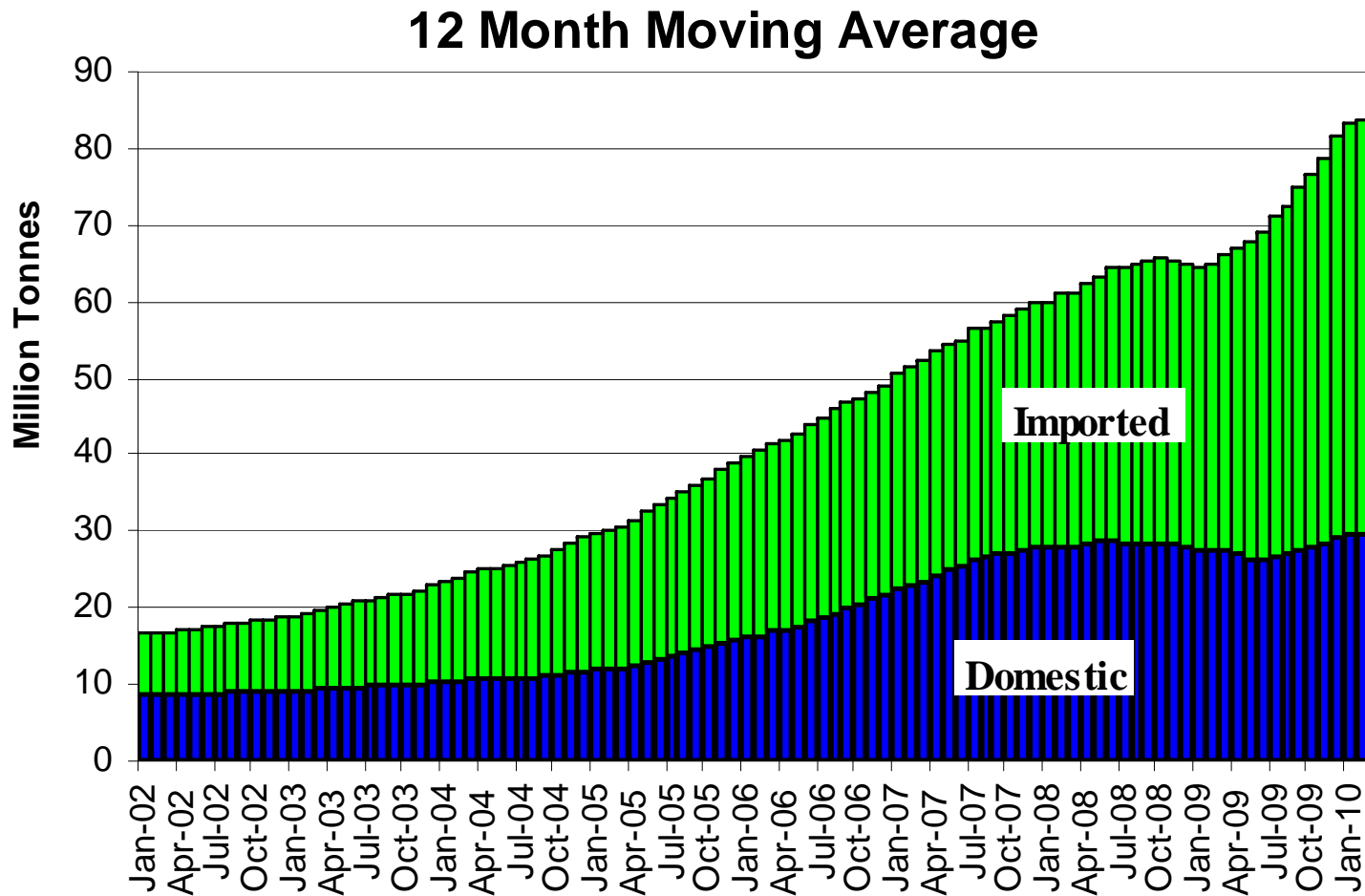
# Coking Coal Prices



Source: GTIS, CRU, Platts, Macquarie Research, March 2010

**Despite export volumes soaring (and China's imports soaring), prices have yet to touch prior peaks**

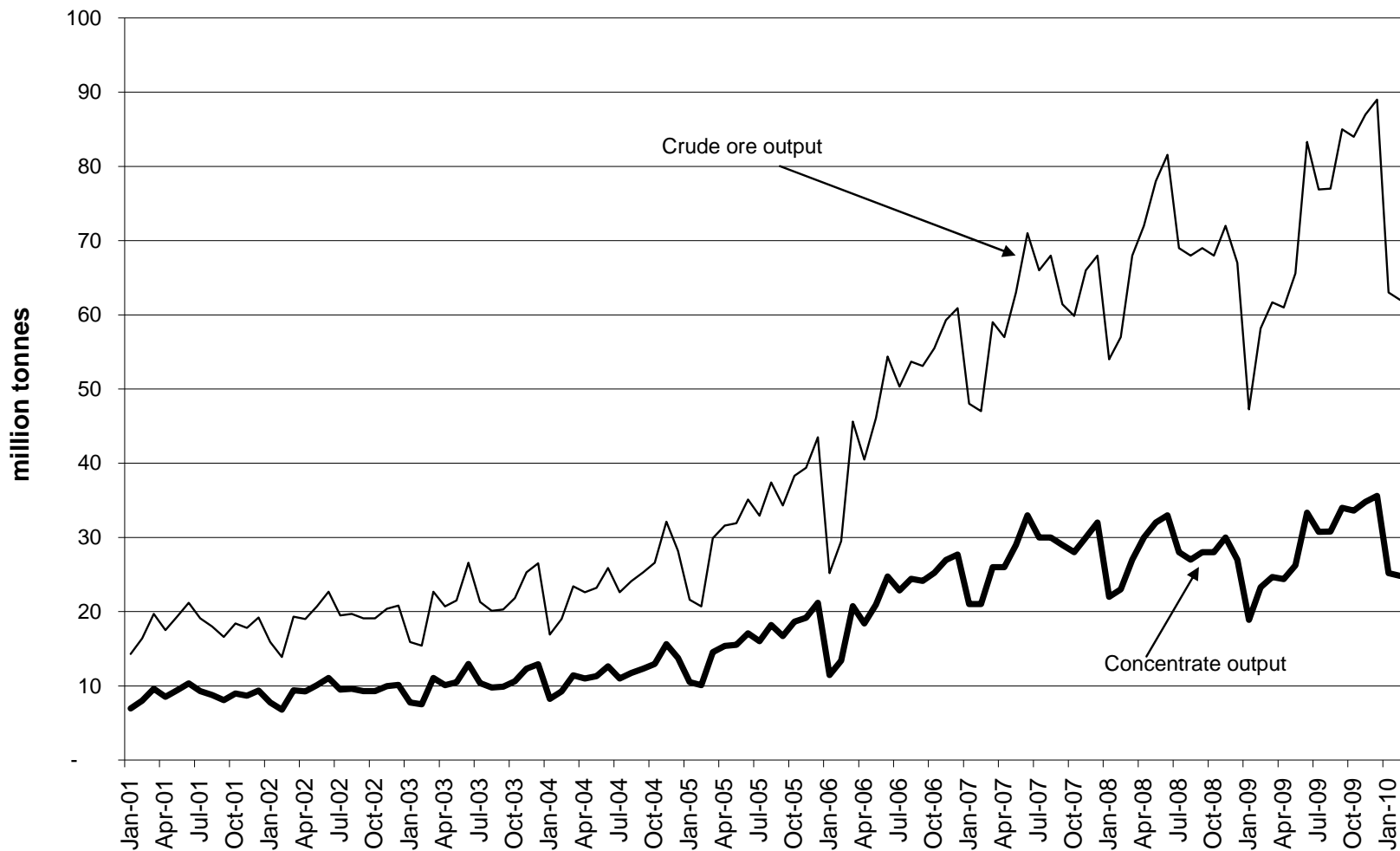
# Chinese Iron Ore Apparent Consumption



Source: WSD & China Statistics

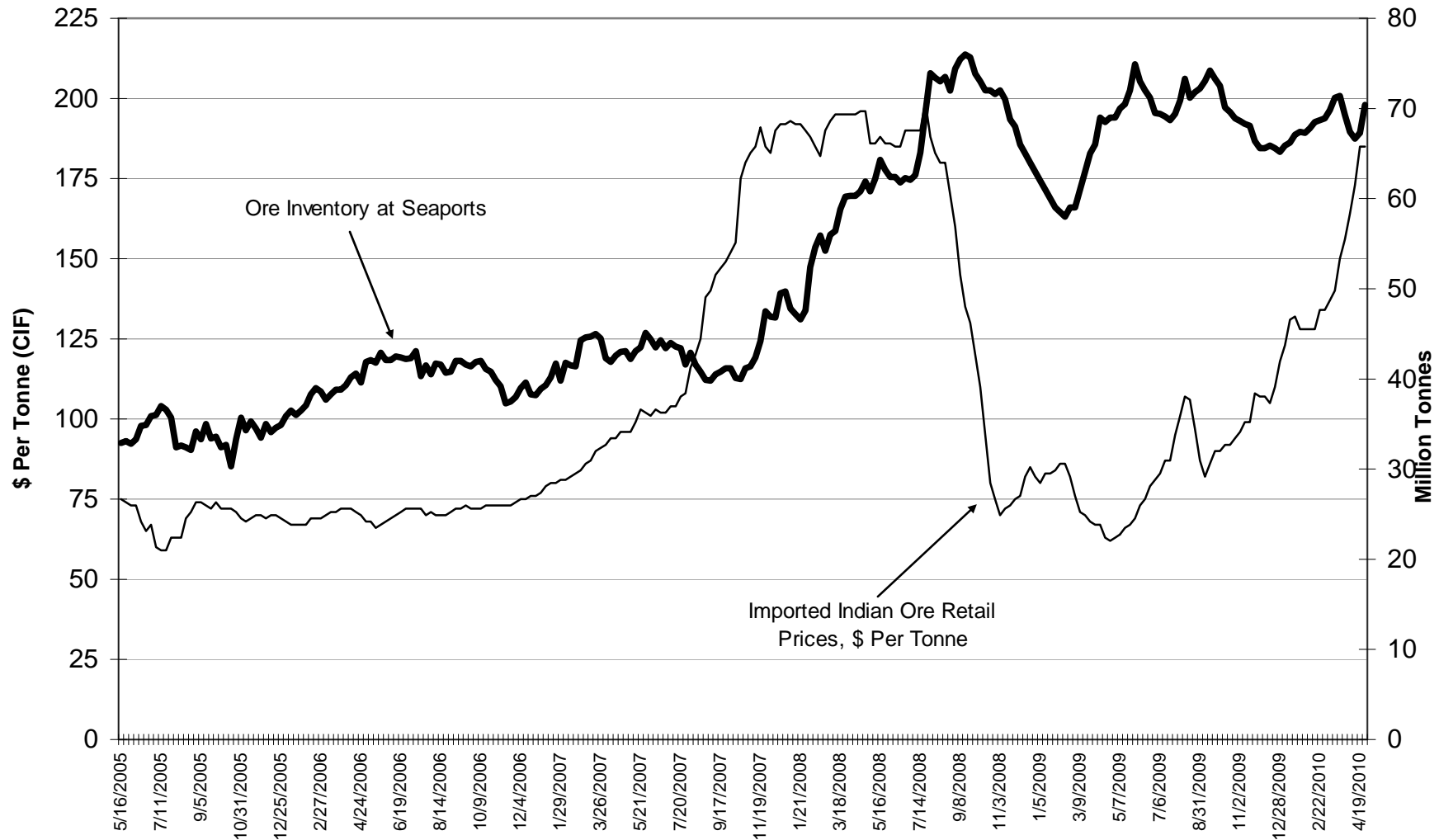
**Imported iron ore continues to grow as a share of overall Chinese consumption**

# Chinese Domestic Iron Ore Production



**Domestic production has grown steadily, albeit not enough to offset the need for imported materials**

# Chinese Iron Ore Inventory



**Inventory levels have been fairly steady since the fall of 2008, despite a massive increase in steel production since that time**

# Chinese Iron Ore Production

## China Steel Production and Consumption, Quarterly

(million tonnes)

	2009					2010e					2011					
	Q1	Q2	Q3	Q4	Year	Q1	Q2	Q3	Q4	Year	Q1	Q2	Q3	Q4	Year	
<b>Steel production</b> <i>(not seasonally adjusted)</i>	<b>128</b>	<b>139</b>	<b>154</b>	<b>155</b>	<b>576</b>	<b>158</b>	<b>170</b>	<b>163</b>	<b>150</b>	<b>641</b>	<b>156</b>	<b>169</b>	<b>175</b>	<b>170</b>	<b>670</b>	
<b>Inventory Change</b>	0	0	10	20	30	15	15	-5	-15	10	0	0	-2	-5	-7	
<b>Import</b>	4	7	6	6	23	4	5	5	5	19	4	5	5	4	18	
<b>Export</b>	5	5	7	9	26	9	15	15	10	49	10	12	12	9	43	
<b>Net export</b>	1	-2	1	3	3	5	10	10	5	30	6	7	7	5	25	
<b>Real steel consumption</b>	<b>127</b>	<b>141</b>	<b>143</b>	<b>132</b>	<b>543</b>	<b>138</b>	<b>145</b>	<b>158</b>	<b>160</b>	<b>601</b>	<b>150</b>	<b>162</b>	<b>170</b>	<b>170</b>	<b>652</b>	
<b>Pig production</b>	<b>122</b>	<b>133</b>	<b>148</b>	<b>149</b>	<b>552</b>	<b>150</b>	<b>163</b>	<b>156</b>	<b>143</b>	<b>612</b>	<b>149</b>	<b>162</b>	<b>168</b>	<b>163</b>	<b>642</b>	
<b>Total concentrate ore demand</b> <sup>(1)</sup>	201	219	244	246	911	248	269	257	236	1,010	246	267	277	269	1,059	
<b>less: China concentrate production</b>	66	85	95	104	350	86	106	117	126	435	H <sup>(2)</sup> L <sup>(2)</sup>	97	115	126	136	474
												85	100	105	90	380
<b>Equals: Import ore requirement</b>	135	134	149	142	561	162	163	140	110	575	H L	149	152	151	133	585
												161	167	172	179	679
<b>Foreign ore imports</b>	132	166	172	158	628	155	146	140	120	561	H	140	150	151	133	574
<b>Iron ore inventory change</b>	-3	32	23	16	67	-7	-17	0	10	-14		-9	-2	0	0	-11

Note: (1) Pig production \*1.65

(2) Concentrate ore production in China will depend on market prices. H(2): International benchmark prices are over \$110 per tonne; L(2) is lower than \$80 per tonne

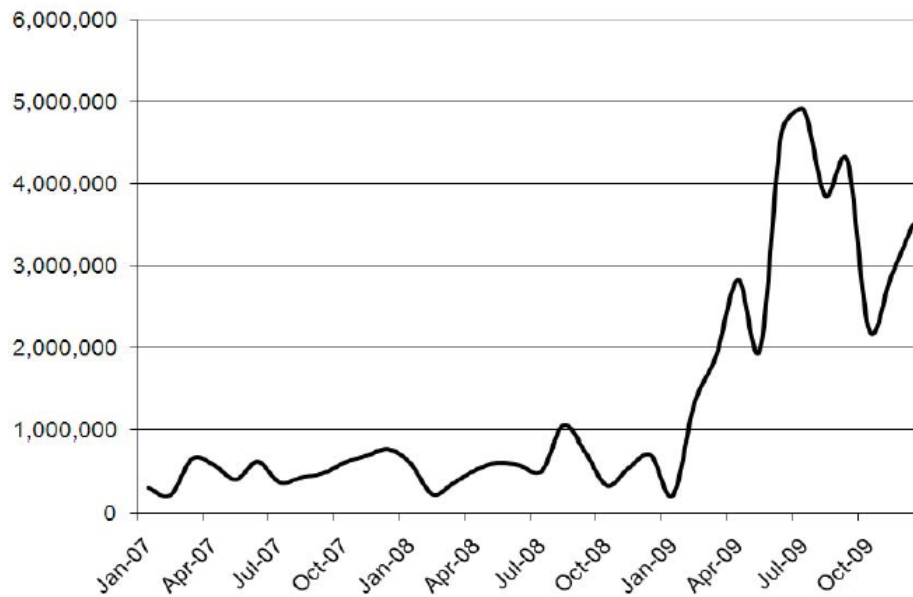
(3) Ore inventory at major Chinese ports is about 67 million tonnes.

Source: WSD estimates

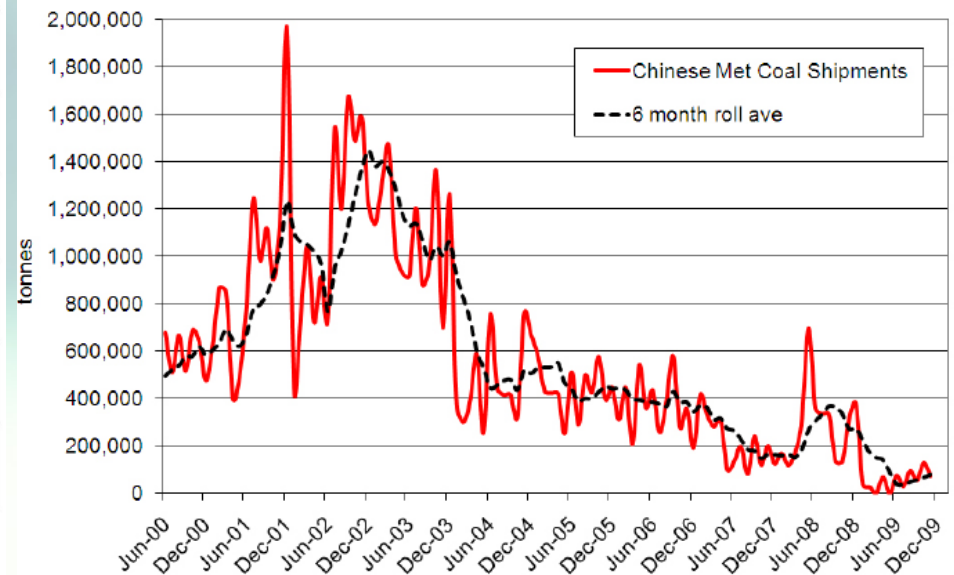
**Imported iron ore continues to grow as a share of overall Chinese consumption**

# Chinese Coking Coal Imports/Exports

China: Monthly Metallurgical Coal Imports since Jan 2007 (tonnes)



Chinese Exports by Month since 2000



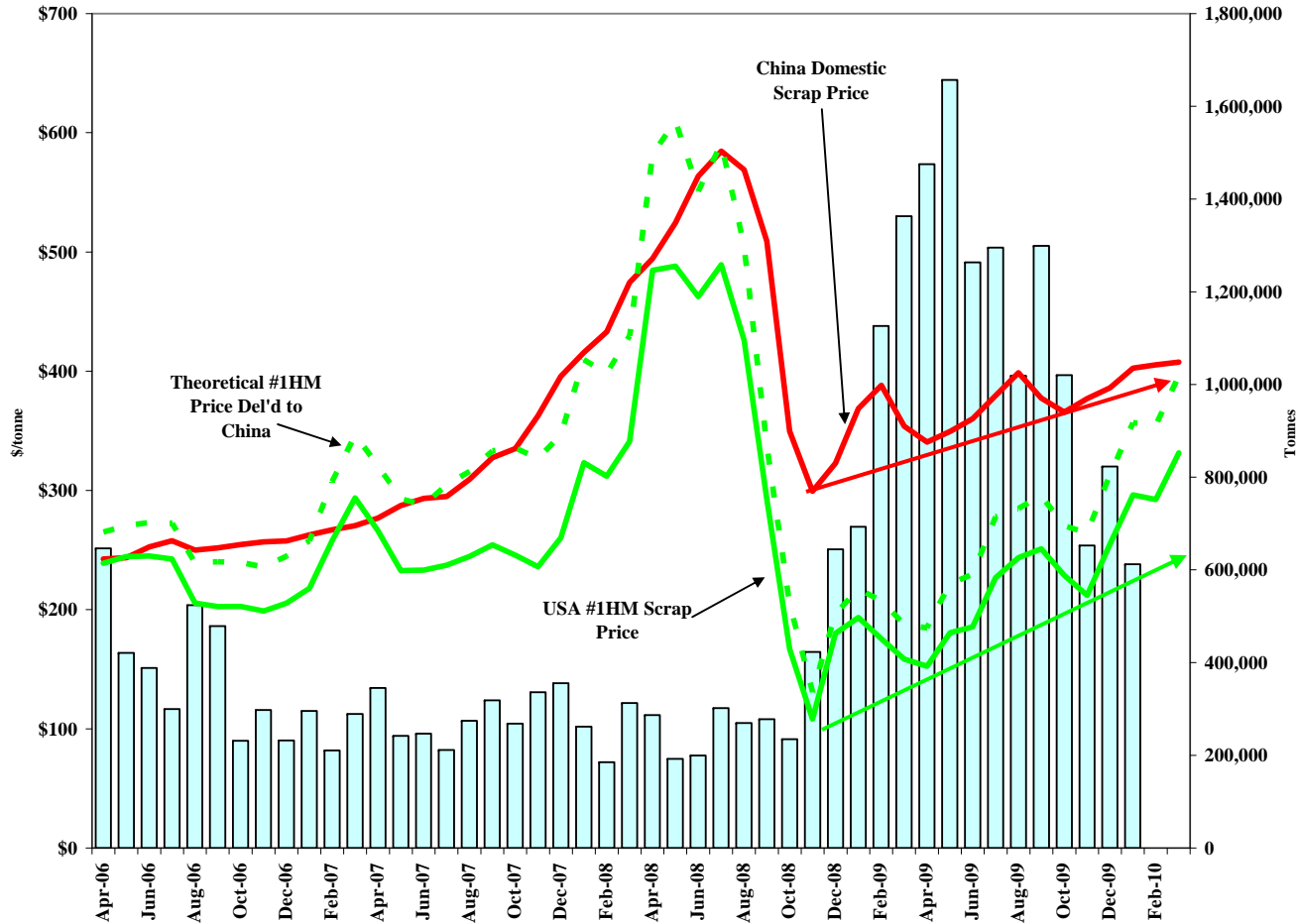
Source: MCR

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**China's exit from the export market and reversal to substantial net imports has tightened the global export market**

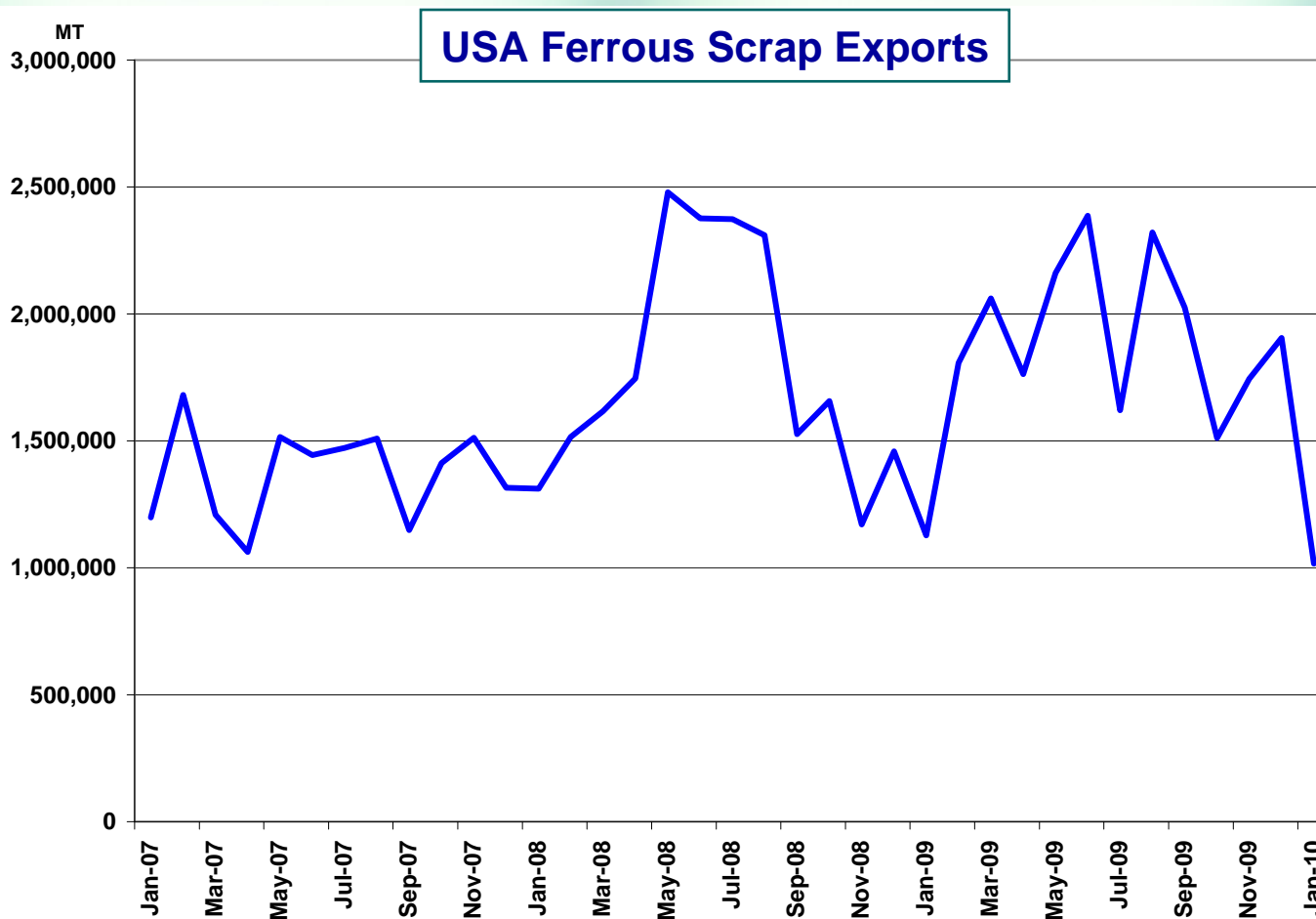
# Regional Price Arbitrage Driving China's Scrap Imports Regional Price Gap is Closing

China's Scrap Imports and Domestic Scrap Price v. USA Scrap Price(s)



**China may reduce imports of USA scrap temporarily, but expect them to return once the next arbitrage opportunity arises**

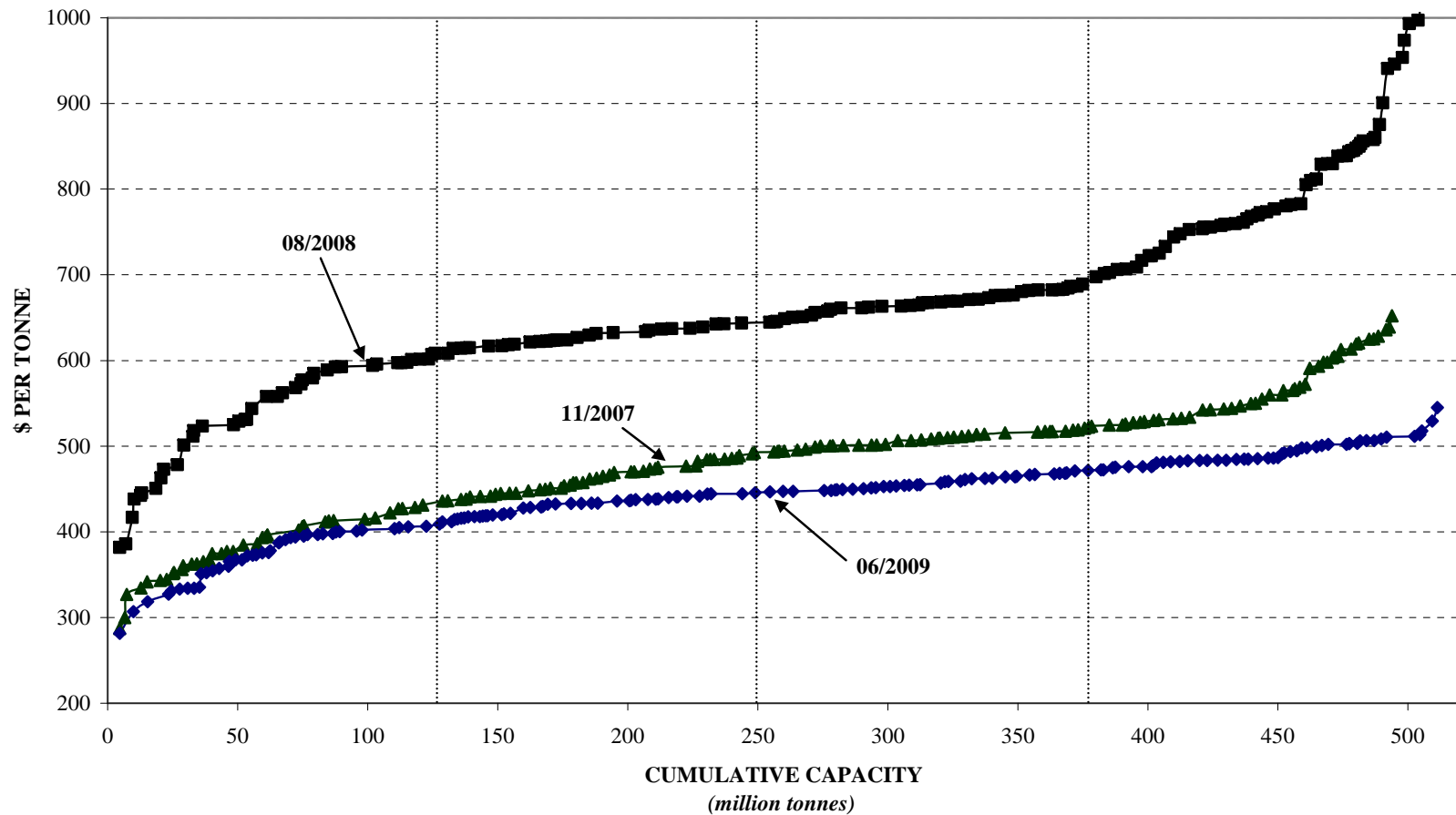
**USA High Ferrous Scrap Prices are Supported by High Export Volumes and Higher Domestic Steel Production Levels**



**Steel scrap exports did not slow during 2009, supported in part by growing demand from China**

# Global Steelmaking Cost-Curve Evolution

WSD 2009 versus 2008 and 2007 World Cost Curve for Sheet Producers  
Hot Rolled Band Operating Costs including Overhead



2010 Costs during Q2-Q3 may resemble the 2008 curve, perhaps with the exception of the fourth quadrant

# Integrated Producers' Costs Rise \$130/MT (year/year)

## WSD 2010 Global Steel Mill Cost Change Forecast - March 2010

(Production in metric tonnes, Prices in \$ per tonne)

		-----2009-----			-----2010-----		
		Usage per Tonne <u>Shipped</u>	Market Price of <u>Input</u>	Production Cost <u>of Input</u>	Input Price <u>Change</u>	Impact per Tonne <u>Shipped</u>	<u>New Cost</u>
<b>BF/BOF Sheet Mills - 95% of Total</b>							
Iron Ore (Fines & Pellets)							
	Purchased	1.0 Tonnes	\$70	\$70	\$56/T	\$56	\$126
	Self-Supplied	0.6 Tonnes	\$40	\$24	\$1/T	\$1	\$25
	<i>Sub-Total</i>	<i>1.6 Tonnes</i>		<i>\$94</i>			<i>\$151</i>
Coking Coal							
	Purchased	0.55 Tonnes	\$129	\$71	\$80/T	\$48	\$119
	Self-Supplied	0.05 Tonnes	\$85	\$4	\$2/T	\$0.1	\$4
	<i>Sub-Total</i>	<i>0.6 Tonnes</i>		<i>\$75</i>			<i>\$123</i>
Scrap							
		0.2 Tonnes	\$250	\$50	\$150/T	\$30	\$80
	Home Scrap Credit	0.1 Tonnes	-\$250	-\$25	\$150/T	-\$15	-\$40
Electricity							
		200 kWh	\$0.07	\$14	4%	\$1	\$15
Other Energy							
		12 mmBTU	\$5.2	\$62	10%	\$6	\$69
Net Labor							
		~1-10 manhours	\$2-\$60	\$70	5%	\$4	\$74
Freight (Inbound)							
		2.4 Tonnes	\$20	\$48	\$4/T	\$10	\$58
All Other Costs							
				\$65	4%	\$2.6	\$68
	<i>Sub-Total</i>			<i>\$454</i>		<i>\$143</i>	<i>\$596</i>
Fixed Cost Impact (F.C. @ \$70/t)							
	70% Operating Rate (2009)			\$30		\$30	
	80% Operating Rate (2010)			\$18		\$18	
	90% Operating Rate (2010)			\$0		\$0	
	<b>TOTAL</b>			<b>\$484</b>		<b>\$130</b>	<b>\$614</b>

Source: WSD Cost Curve Analysis

**Coking coal, iron ore, and scrap price increases are substantially inflating integrated producers' costs for 2010**

# EAF-based Producers' Costs Rise \$152/MT (year/year)

## WSD 2010 Global Steel Mill Cost Change Forecast - March 2010

(Production in metric tonnes, Prices in \$ per tonne)

		-----2009-----		-----2010-----	
<b>EAF-based Mini Sheet Mills - 5% of Total</b>					
Iron Ore (Fines & Pellets)					
Purchased	0 Tonnes	\$70	\$0	\$56/T	\$0
Self-Supplied	0 Tonnes	\$40	\$0	\$1/T	\$0
<i>Sub-Total</i>	<i>0 Tonnes</i>		<i>\$0</i>		<i>\$0</i>
Coking Coal					
Purchased	0 Tonnes	\$129	\$0	\$80/T	\$0
Self-Supplied	0 Tonnes	\$85	\$0	\$2/T	\$0
<i>Sub-Total</i>	<i>0 Tonnes</i>		<i>\$0</i>		<i>\$0</i>
Scrap, Pig Iron and DRI					
	1.1 Tonnes	\$280	\$308	\$150/T	\$165
Home Scrap Credit	0.1 Tonnes	-\$250	-\$25	\$150/T	-\$15
Electricity					
	600 kWh	\$0.07	\$42	4%	\$2
Other Energy					
	5 mmBTU	\$5.2	\$26	10%	\$3
Net Labor					
	~1-10 manhours	\$2-\$60	\$35	5%	\$2
Freight (Inbound)					
	1.3 Tonnes	\$20	\$22	\$4/T	\$10
All Other Costs					
			\$45	4%	\$2
	<b><i>Sub-Total</i></b>		<b><i>\$453</i></b>	<b><i>\$0</i></b>	<b><i>\$167</i></b>
Fixed Cost Impact (F.C. @ \$60/t)					
	70% Operating Rate (2009)		\$26		\$26
	80% Operating Rate (2010)		<b>\$15</b>		<b>\$15</b>
	90% Operating Rate (2010)		\$0		<b>\$0</b>
	<b>TOTAL</b>		<b>\$468</b>		<b>\$152</b>
					<b>\$620</b>

Source: WSD Cost Curve Analysis

**As previously outlined, scrap remains volatile and biased to the upside – hence, EAF producer's costs are also likely to rise substantially**

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# NA Iron Ore Start-up Projects

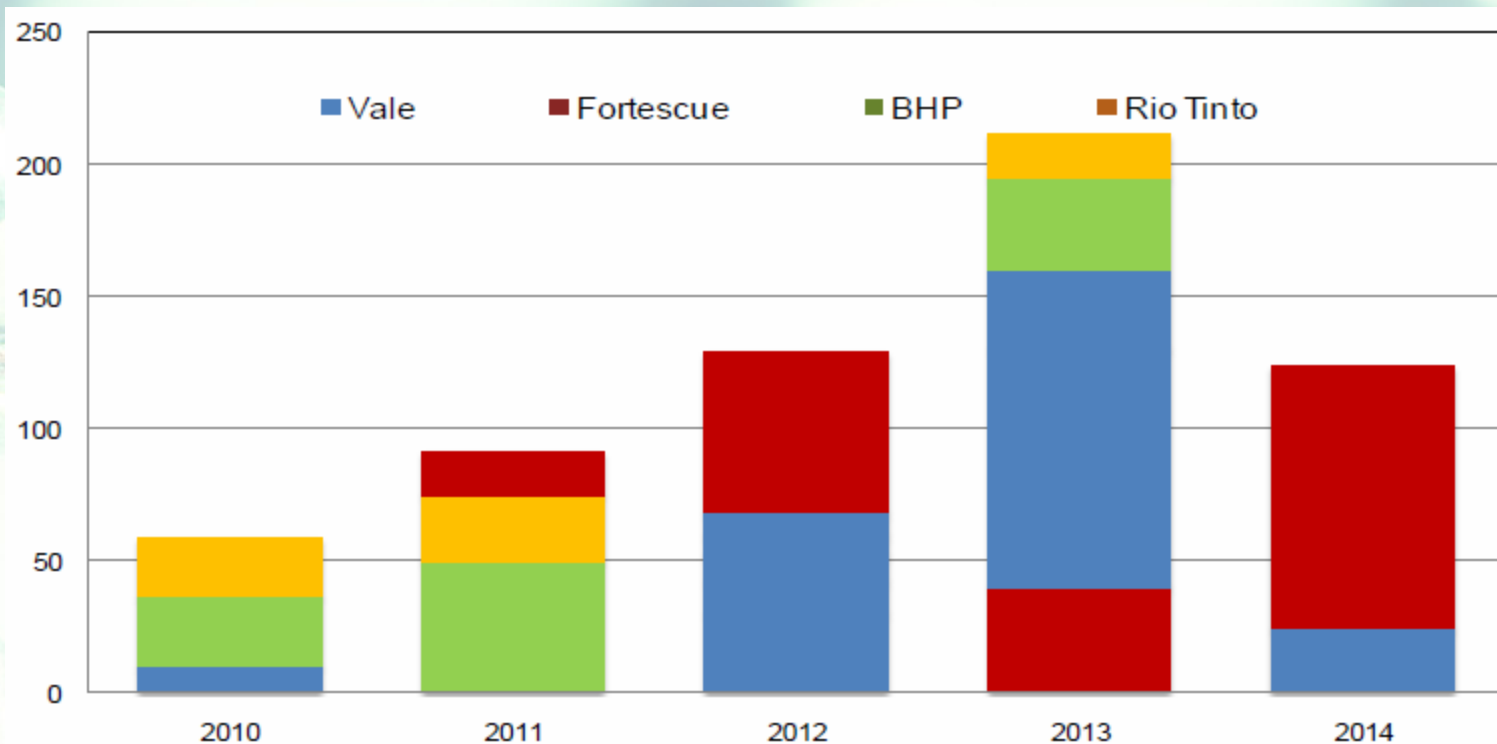
Project	Probability of Operating in 5 years		
	<u>Good</u>	<u>Maybe</u>	<u>Unlikely</u>
	<i>(Millions LTP/y)</i>		
<b>Juniors</b>			
Consolidated Thompson – Bloom Lake	8.0*		
Consolidated Thompson – Pepler/Lamelee		8.0	
Labrador Iron	3.0*	3.0	
New Millennium DSO	4.0*		
New Millennium-pellet		8.0	
Baffinland	18.0		
Adriana		10.0	
Roche Bay			4.0
<b>Other Projects</b>			
Iron Nugget –MN	1.5**		
Iron Nugget – MI		1.0	
Magnetation – MN	1.5		
Essar Steel, MN	4.1		
IOC-concentrate	4.0		
IOC-pellets		4.0	
<b>Expansions</b>			
KeeTac	4.0		
U-Tac	0.7		
Northshore	0.8		
Tilden/Empire	2.0		
Palladon	2.0		
<b>TOTAL</b>	<b>53.6</b>	<b>34.0</b>	<b>4.0</b>

Note: \* Consolidated to start commercial operation in Q2 2010; Labrador in mid-2010 and New Millennium in 2011.

\*\* Started production in January 2010 current capacity of 0.5 million tons to be reached mid-2010.

**Nearly 55 million tonnes of planned capacity additions  
in North America during the next 5 years**

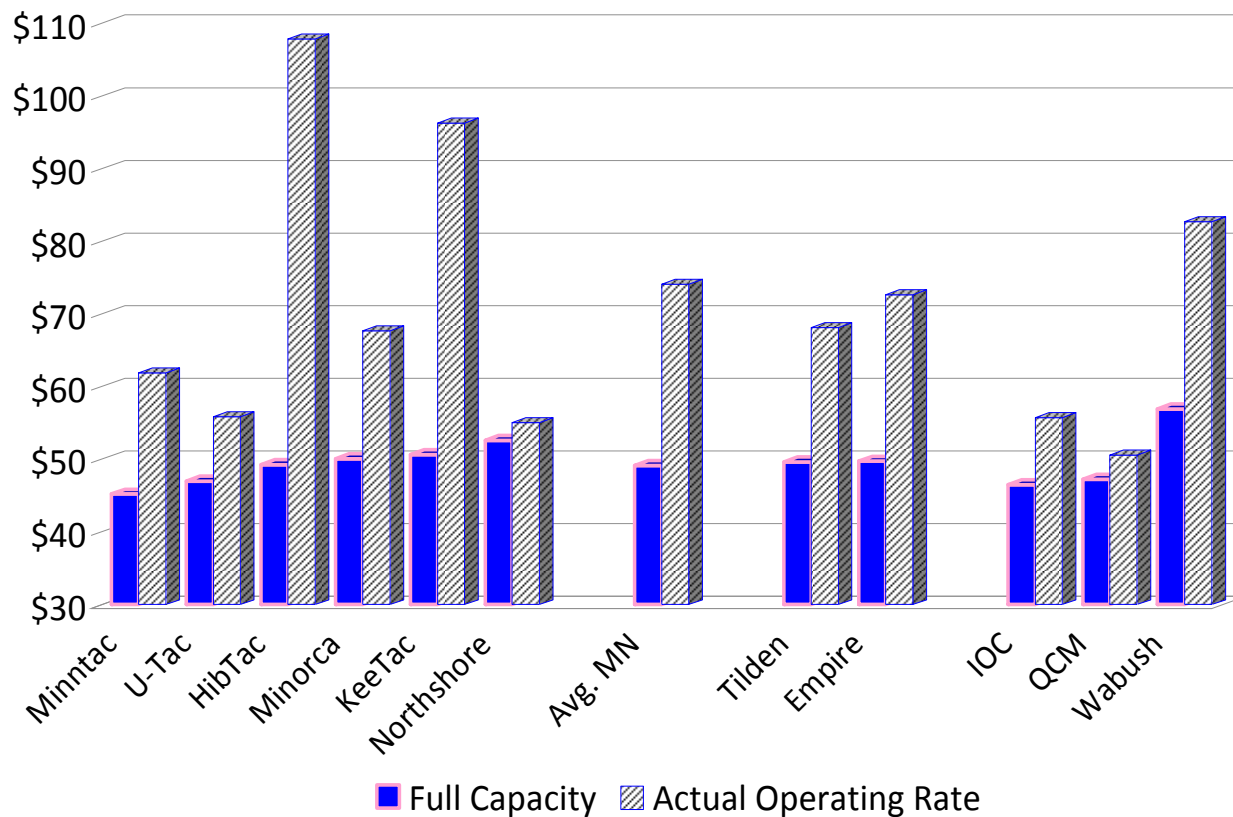
## Big-4 Planned Capacity Additions



**Based on WSD's production forecast for 2011, the planned capacity additions by the big-4 would be in line with incremental demand**

# NA Iron Ore Start-up Projects *Cost Competitive?*

**North American Iron Ore Mine Costs – 2009**  
Full Cap. vs. Actual Oper. Rate; FOB-Port



**Higher market prices and relatively low costs make North American projects a highly attractive proposition today...**

*Thank You for your attention*

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