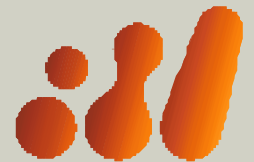


BHP Billiton

Affival Nordic Cored Wire & Alloy Market Seminar

7 September 2006



**bhpbilliton**

# Manganese Industry Overview

Manganese Value System Overview

Manganese End Use Markets

Crude Steel

Manganese Alloy Industry

Manganese Ore Industry

BHP Billiton Manganese

But First, a Little About BHP Billiton

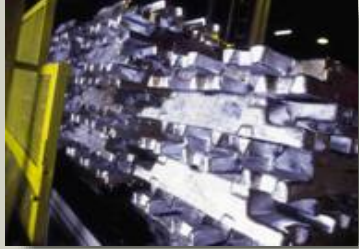


# Structure driven by customer needs

**Petroleum**



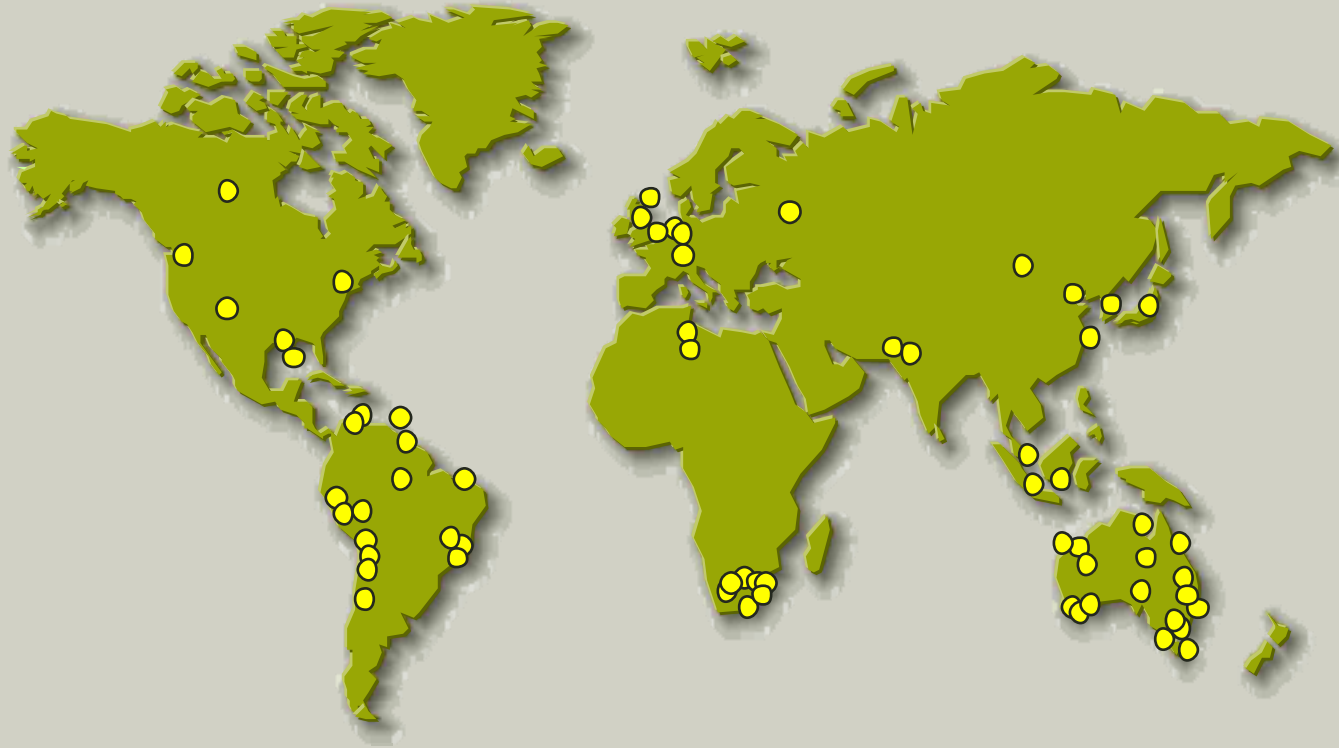
**Aluminium**



**Base Metals**



**Carbon Steel Materials**



**Diamonds & Spec Prod**



**Energy Coal**

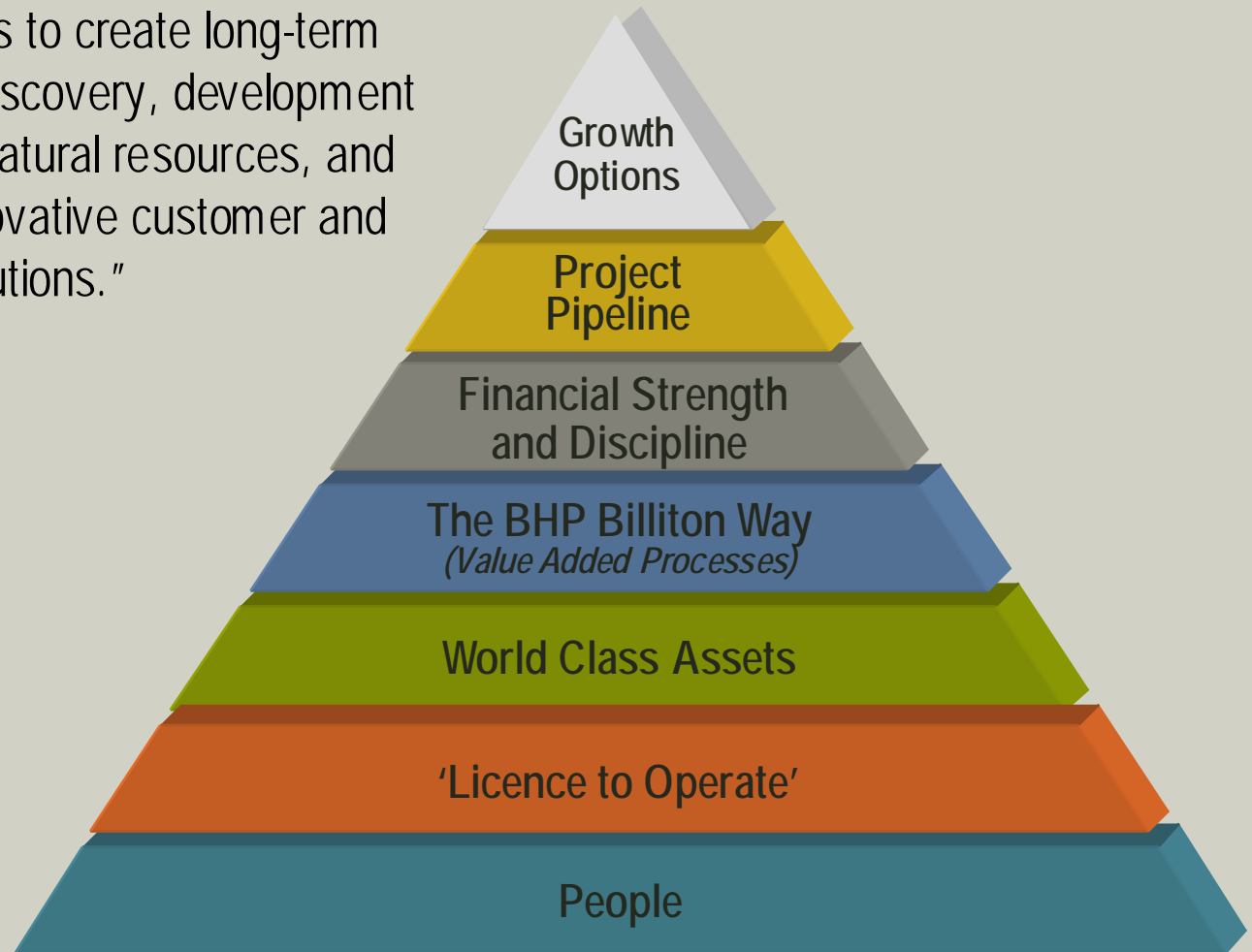


**Stainless Steel Materials**



# Strategic drivers

"Our core purpose is to create long-term value through the discovery, development and conversion of natural resources, and the provision of innovative customer and market-focused solutions."

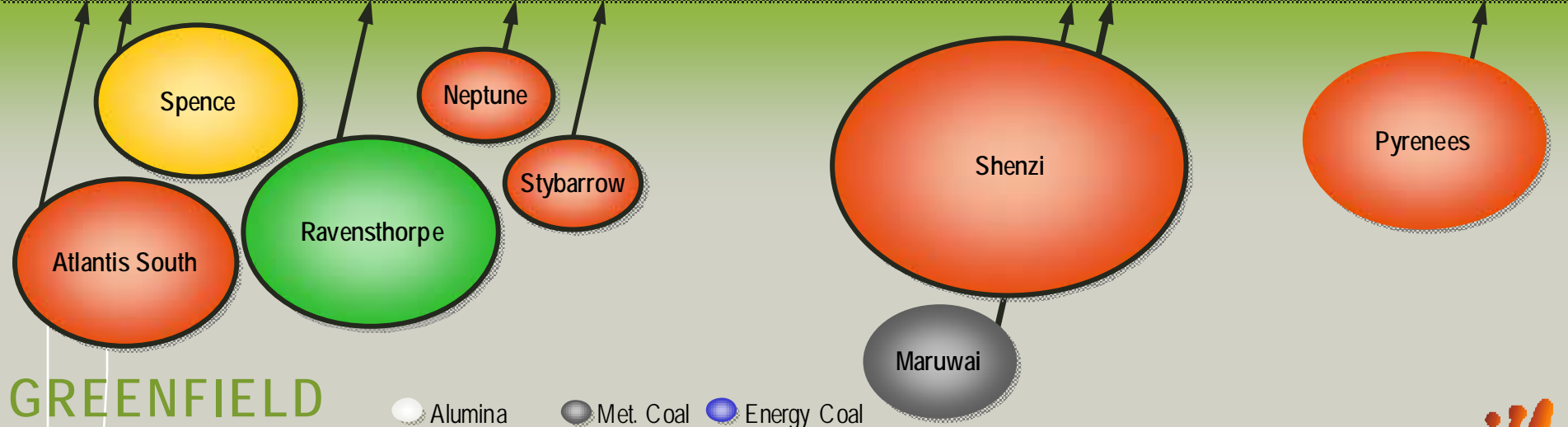
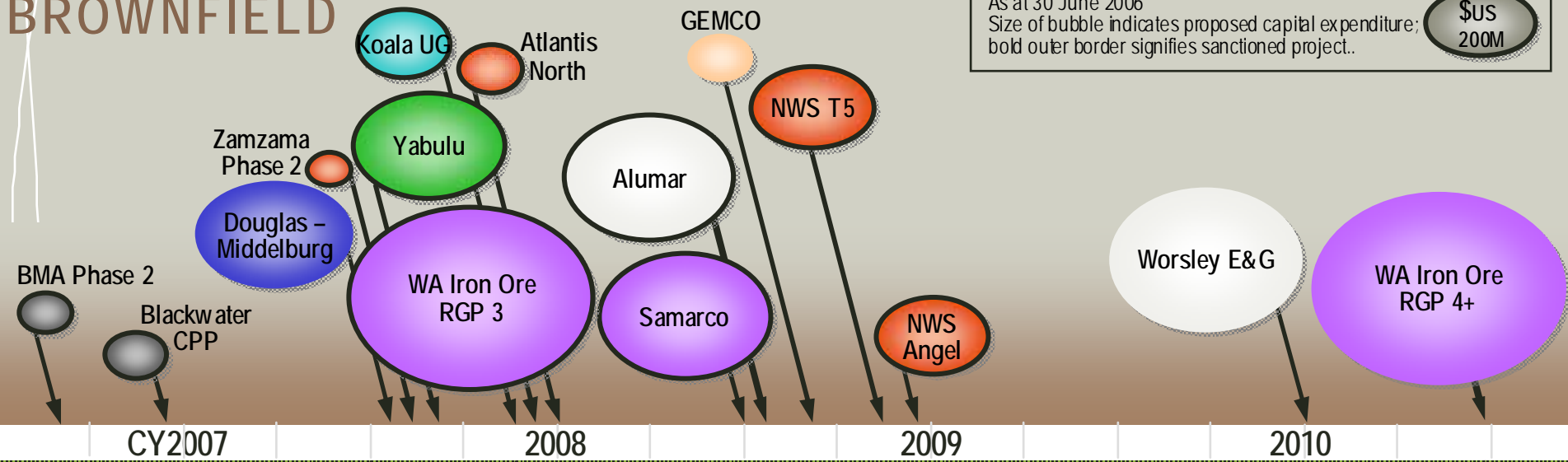


# Deep inventory of growth projects

## BROWNFIELD

As at 30 June 2006  
 Size of bubble indicates proposed capital expenditure;  
 bold outer border signifies sanctioned project.

\$US  
200M



## GREENFIELD

- Alumina
- Base Metals
- Iron Ore
- Met. Coal
- Mn Ore
- Diamonds
- Energy Coal
- Nickel
- Petroleum



# Manganese Industry Overview



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# Manganese Industry Overview

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BHP Billiton Manganese



# The Manganese Value Chain

- Mining
  - Crushing and screening – (sizing, lumpy and fines)
  - Dense Media Separation – (mineral from gangue)
  - Sintering – (increase Mn unit value per ton)
  - Reductive smelting (alloying) & casting – increase Mn unit value per ton further)
- Any one or more of these steps may be bypassed if the grade is high enough
- Logistics

# Manganese Industry Overview

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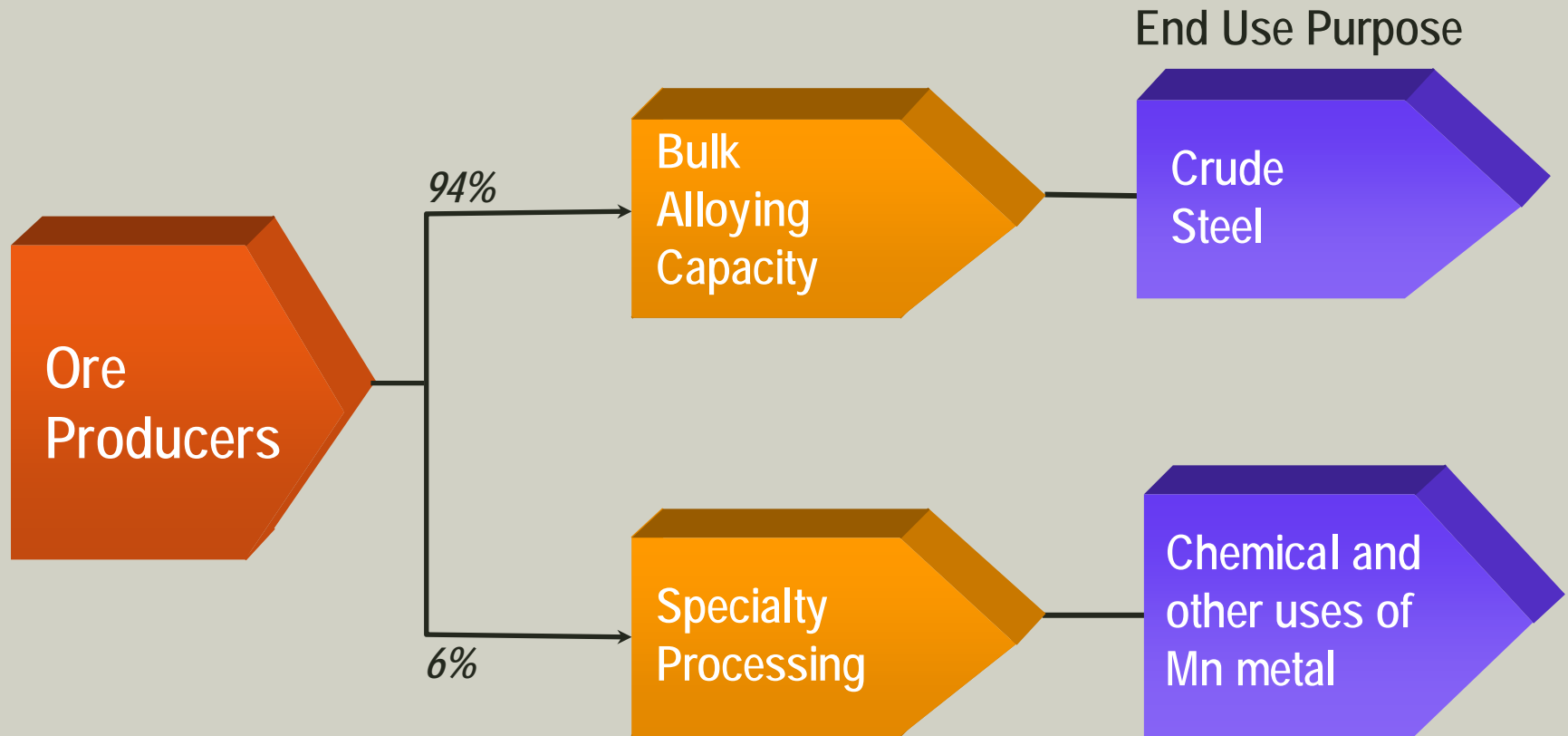
Crude Steel

Manganese Alloy Industry

Manganese Ore Industry

BHP Billiton Manganese

# Manganese End Use Markets



# Effect of Mn on Steel Product Properties

Use of Manganese in steel results in increased:

- Strength
- Hardness
- Toughness/impact resistance
- Wear resistance (e.g. rail steels)
- Machinability
- Ability to be heat treated for superior strength and hardness

# Manganese Industry Overview

Manganese Value System Overview

Manganese End Use Markets

Crude Steel

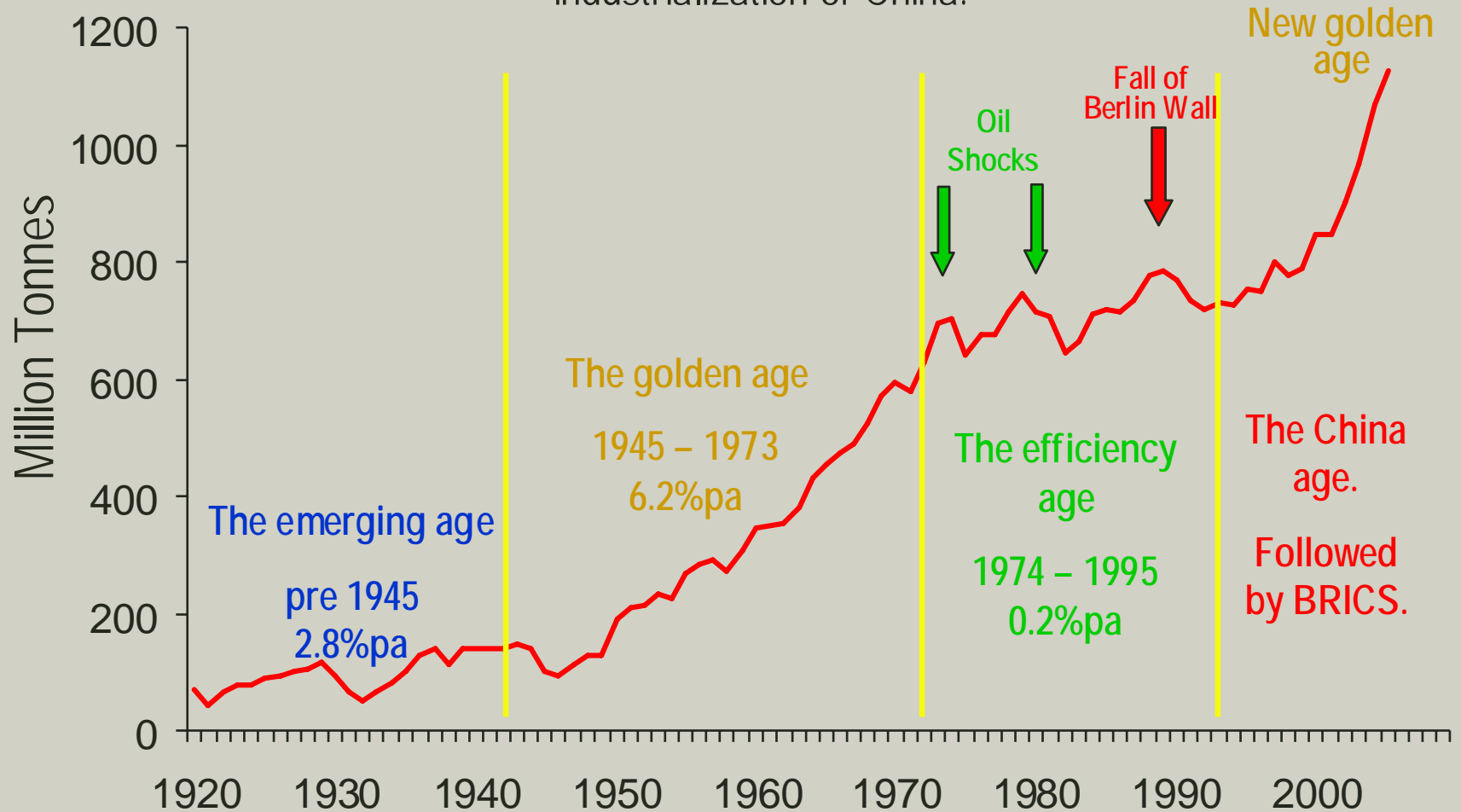
Manganese Alloy Industry

Manganese Ore Industry

BHP Billiton Manganese

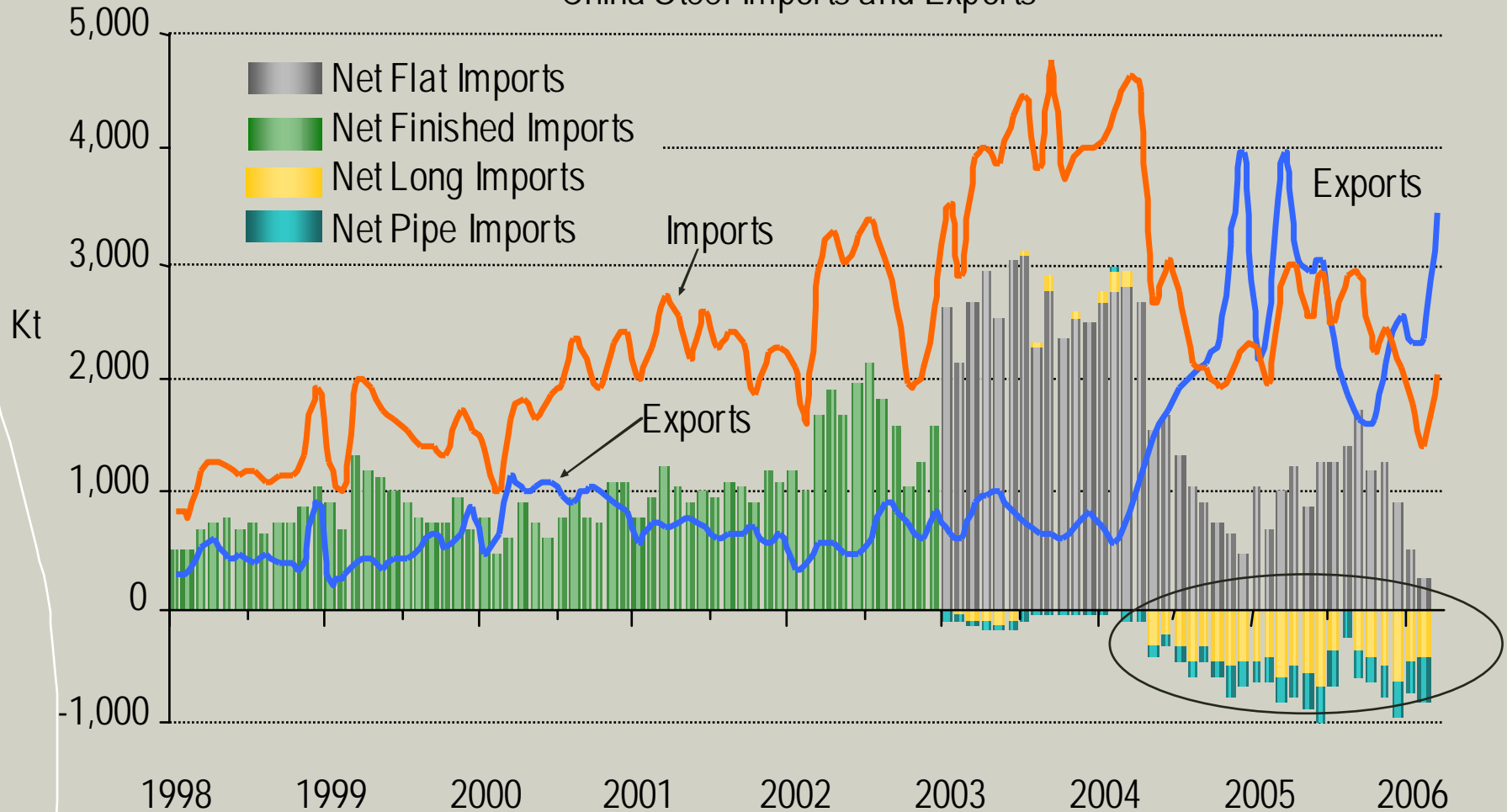
# Global Steel Production Continues in New Golden Age

New age of steel firmly established, parallels between post 1945 and post 1995 industrialization of China.



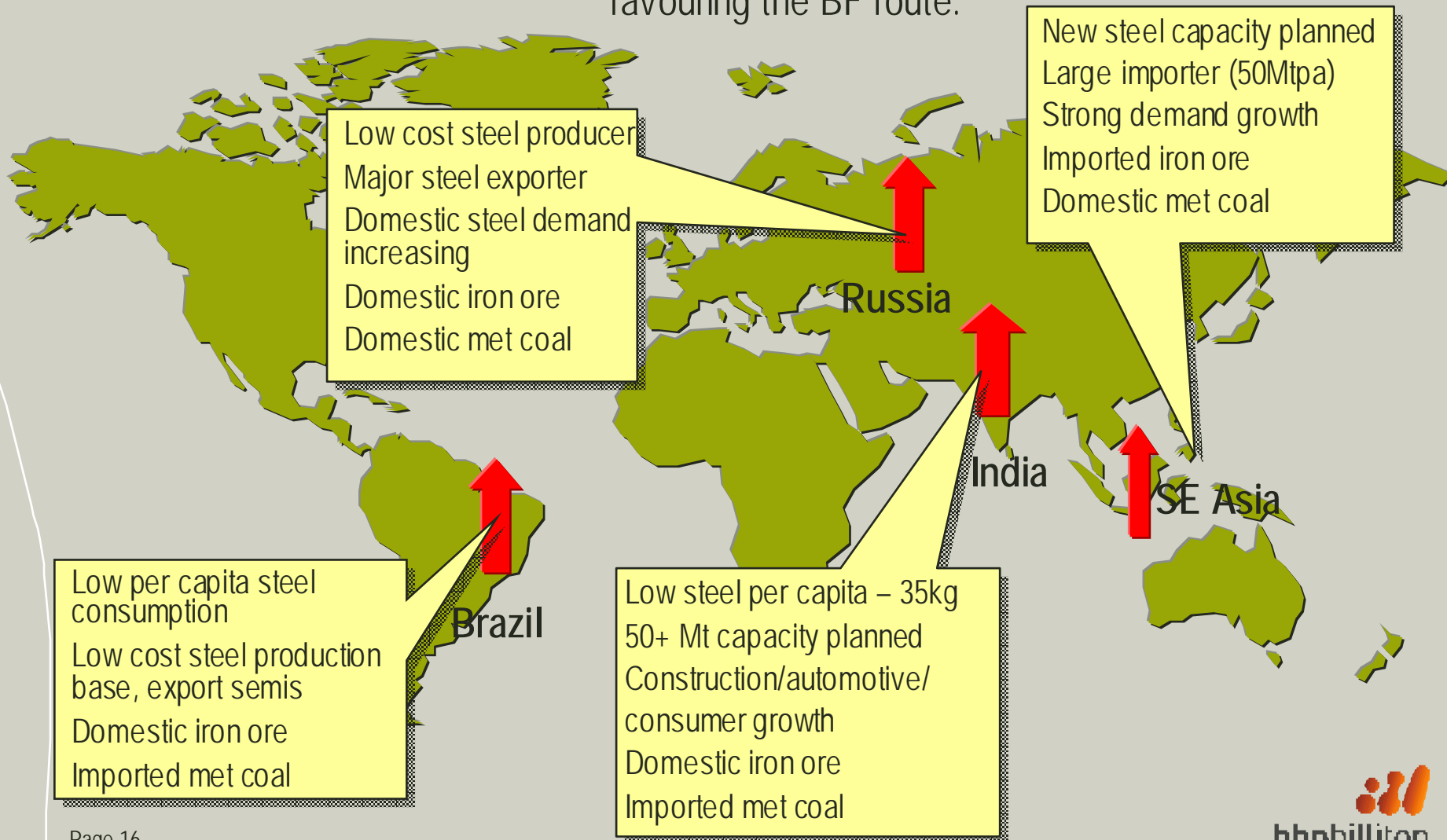
# Chinese Steel Import / Export

## China Steel Imports and Exports



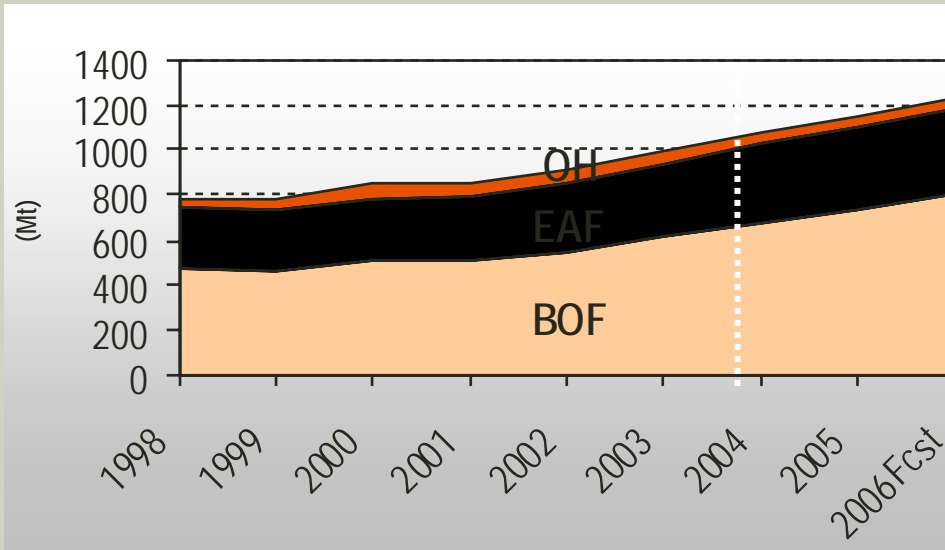
# Steel and Raw Material Impact of Non-China Growth

In addition to China steel growth will be driven by other countries, with a majority favouring the BF route.

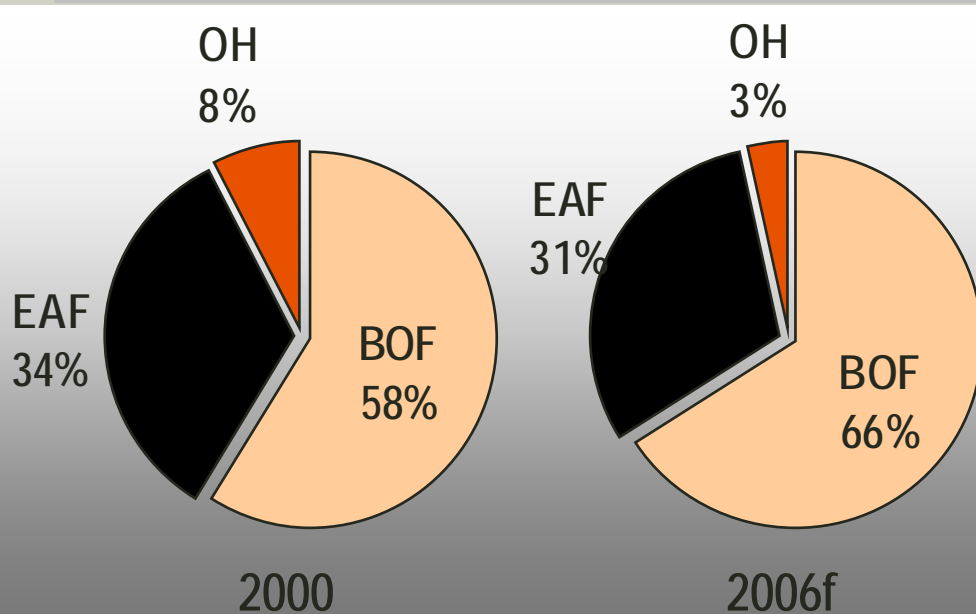




# Steel Process Trends



- BOF maintaining share of total global steel production
- OH declining, being replaced by BOF, EAF
- EAF growing in industrialised countries.
- BOF primary growth in developing countries



# Manganese Industry Overview

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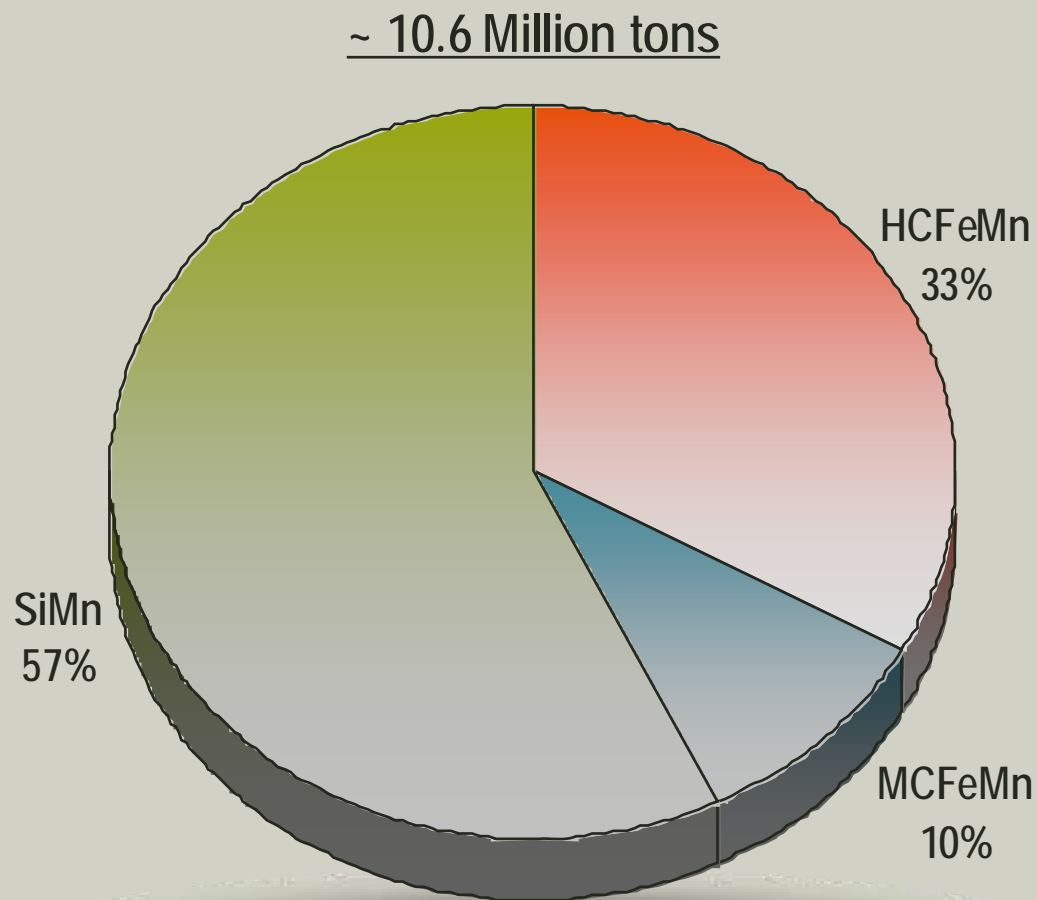
BHP Billiton Manganese

# Manganese Alloy Products

	Chemical Formula	%Mn	Produced in EAF	Produced in BF	Comments
High Carbon Ferromanganese	HCFeMn FeMn	65%-79%			Requires high % of high grade ore
Silicomanganese	SiMn	60%-77%			Can be produced from lower grade ore
Refined	MCFeMn, LCFeMn	80%-81%	Produced from HCFeMn via OBC* route or SiMn via electrothermic route		

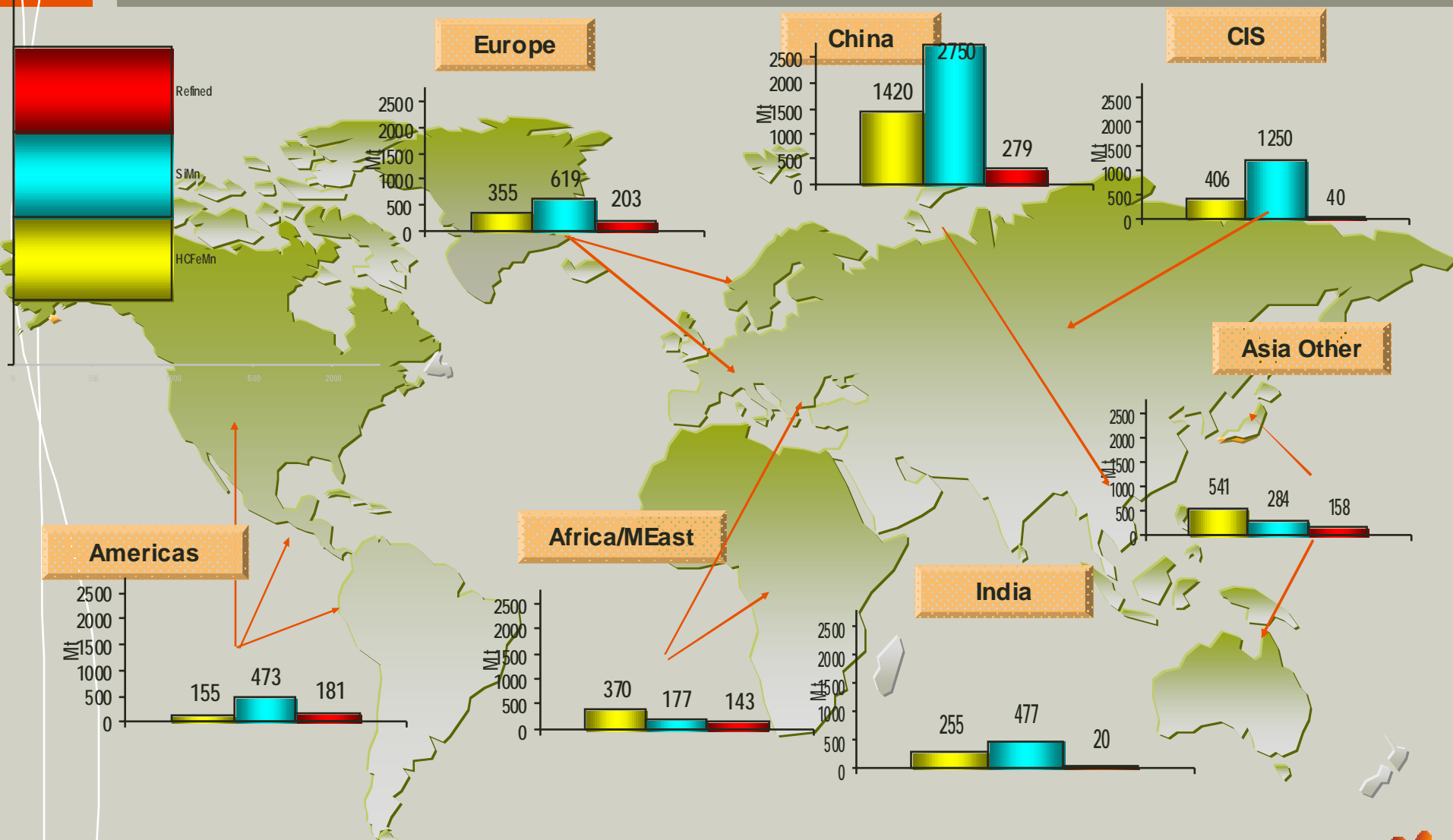
\* Oxygen Blown Converter

# World Manganese Alloy Production 2005 Product Split

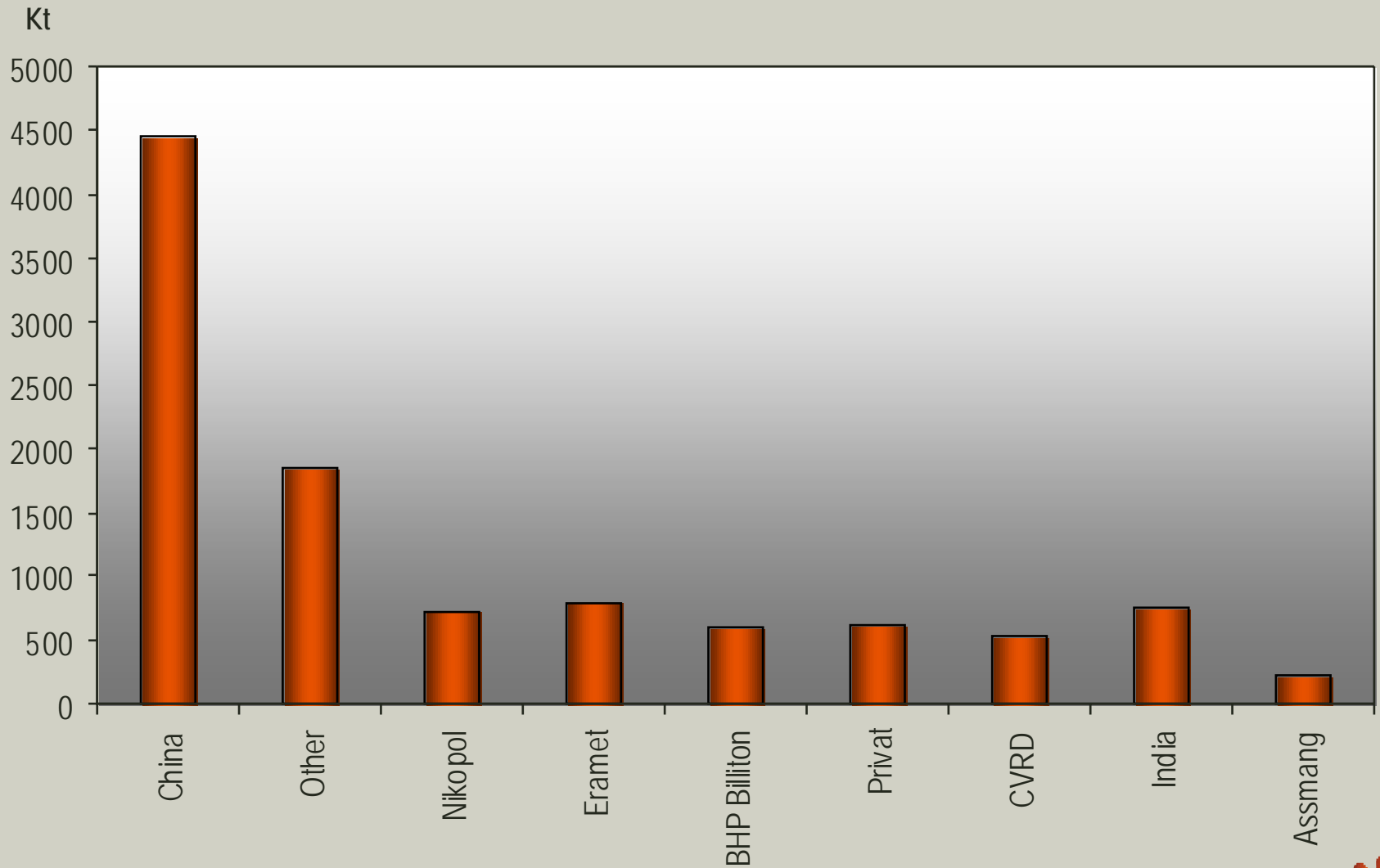


# World Manganese Alloy Production 2005

~10.6 million tons



# Manganese Alloy Production

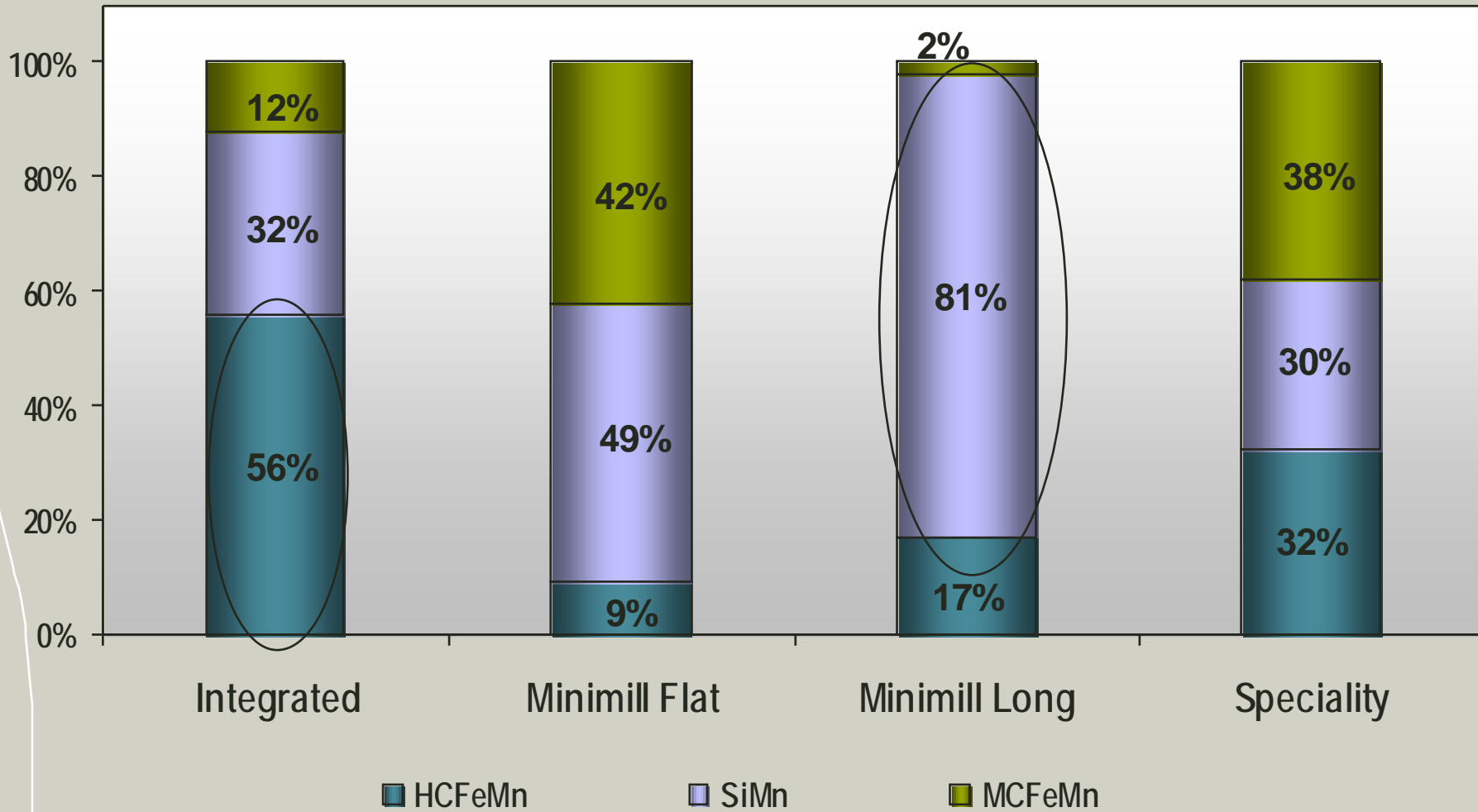


# Manganese Alloy Uses In Steel

- Mainly used in Crude / Mild steel
- Desulphurisation / strengthening
- 5-10kg Mn/mt steel
- Consumed in the form of :

	FeMn	SiMn	MCFeMn
% Mn	78%	65%	80%
Tons high grade ore / ton alloy	2.1	1.85	2.5
Electricity (kWh/mt)	2 600	4 000	3 100

# Manganese Alloy Uses In Steel

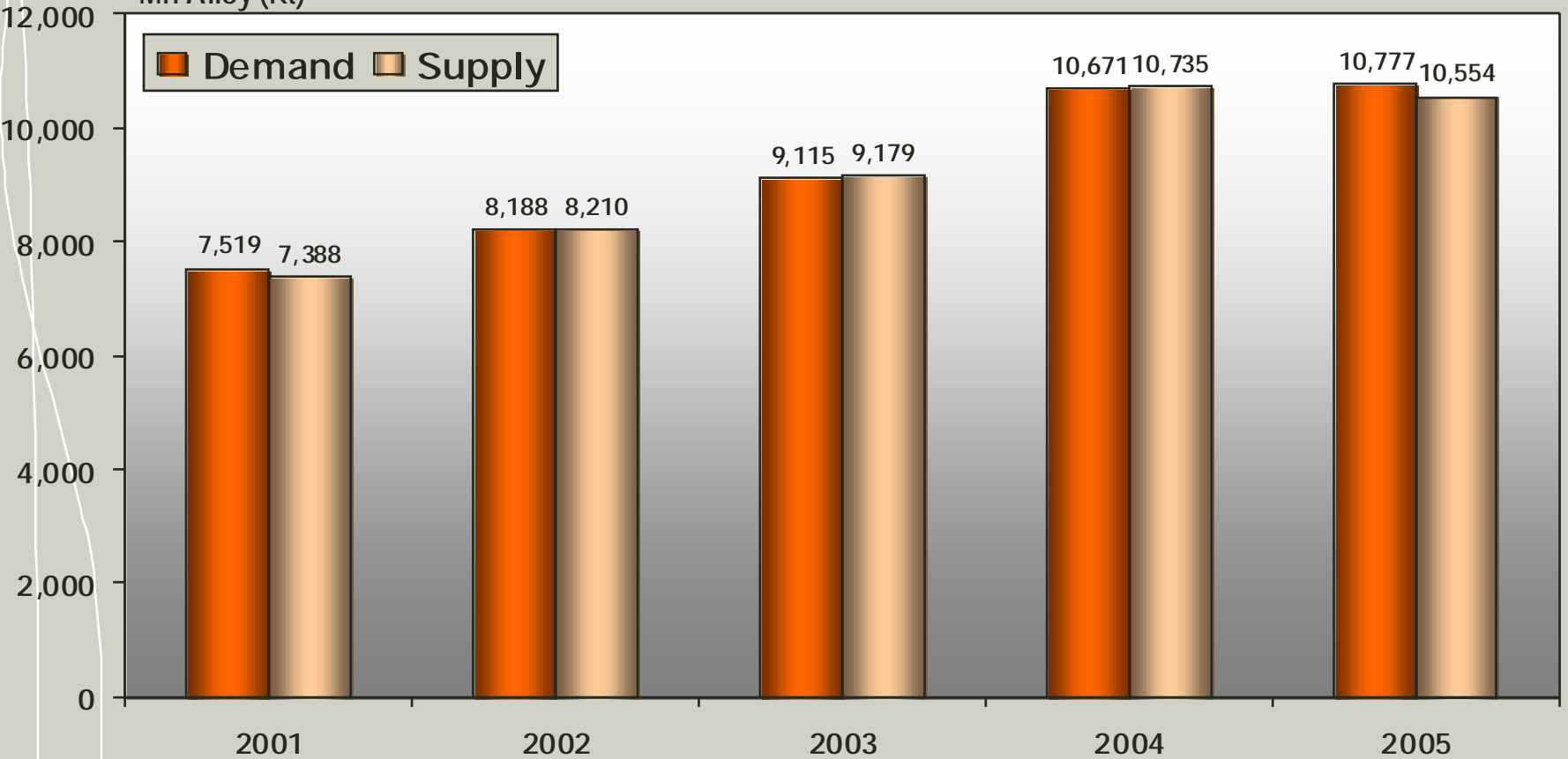




# Manganese Alloy Supply/Demand

Strong growth in Mn alloy demand on the back of strong growth in crude steel production

Mn Alloy (Kt)



# Impact of Crude Steel Industry Dynamics On Manganese Use

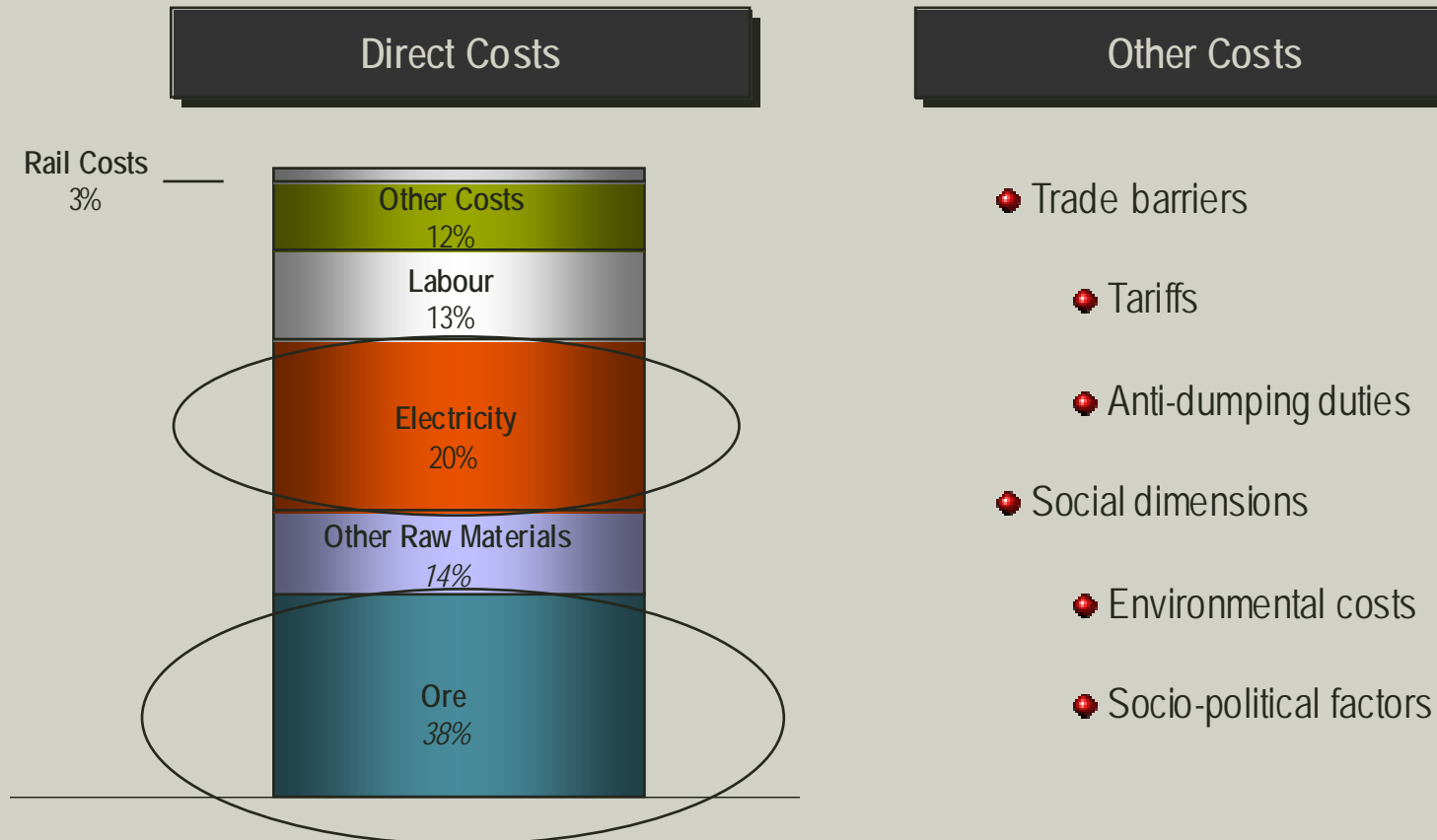
The steel industry is continually changing due to the impact of new technology, ongoing capacity rationalisation and shifts in customer demand.

## Drivers that will impact on Manganese demand:

- Changes in steel making technology
- Type of steel making process being used
  - ⇒ integrated steel plants Vs mini mills
- New steel grade designs

# Manganese Alloy Industry Alloy Production Cost Structure

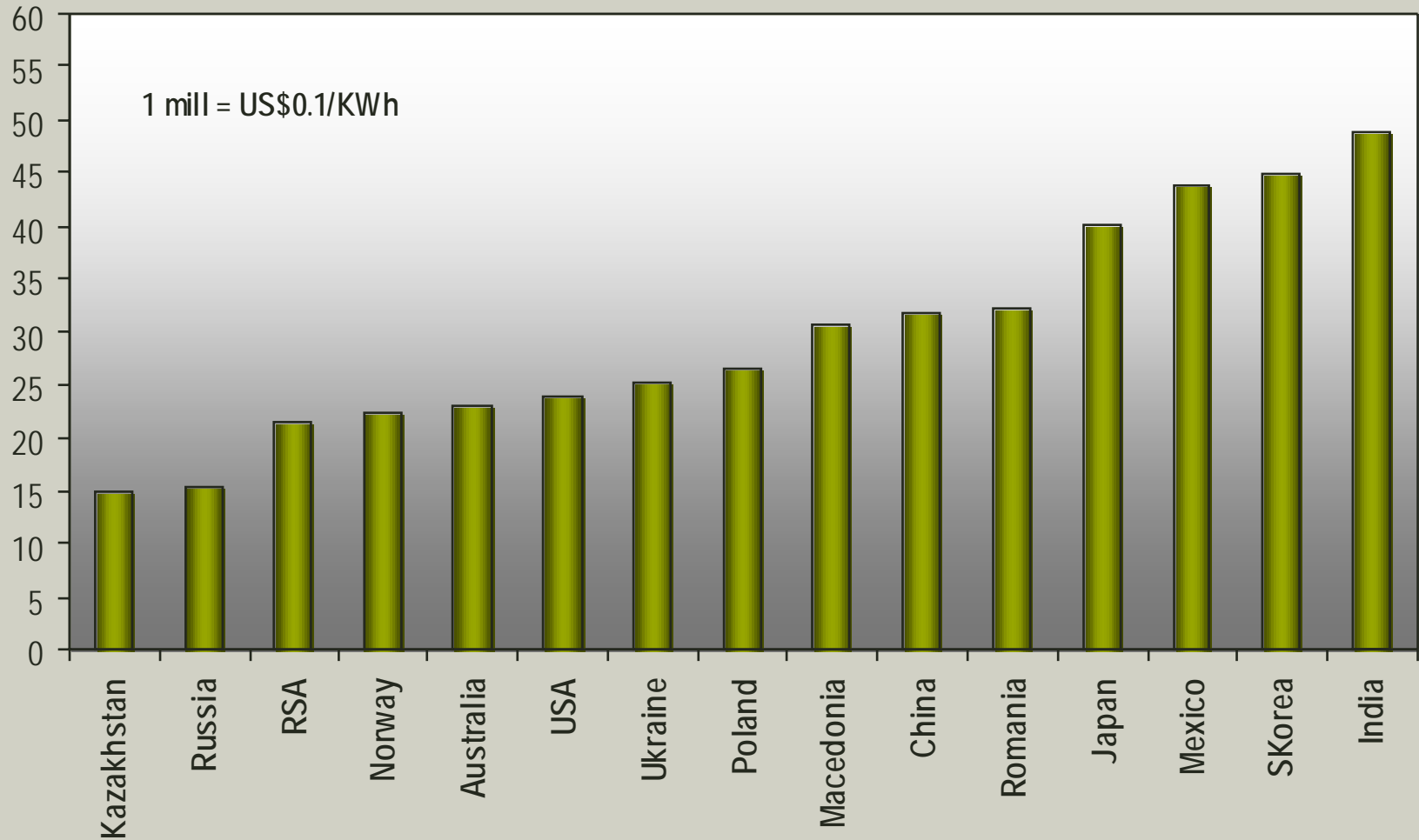
While ore is the dominant cost component, processing costs which vary by location are also significant. The location of alloy plants relate directly to both electricity and labour costs.



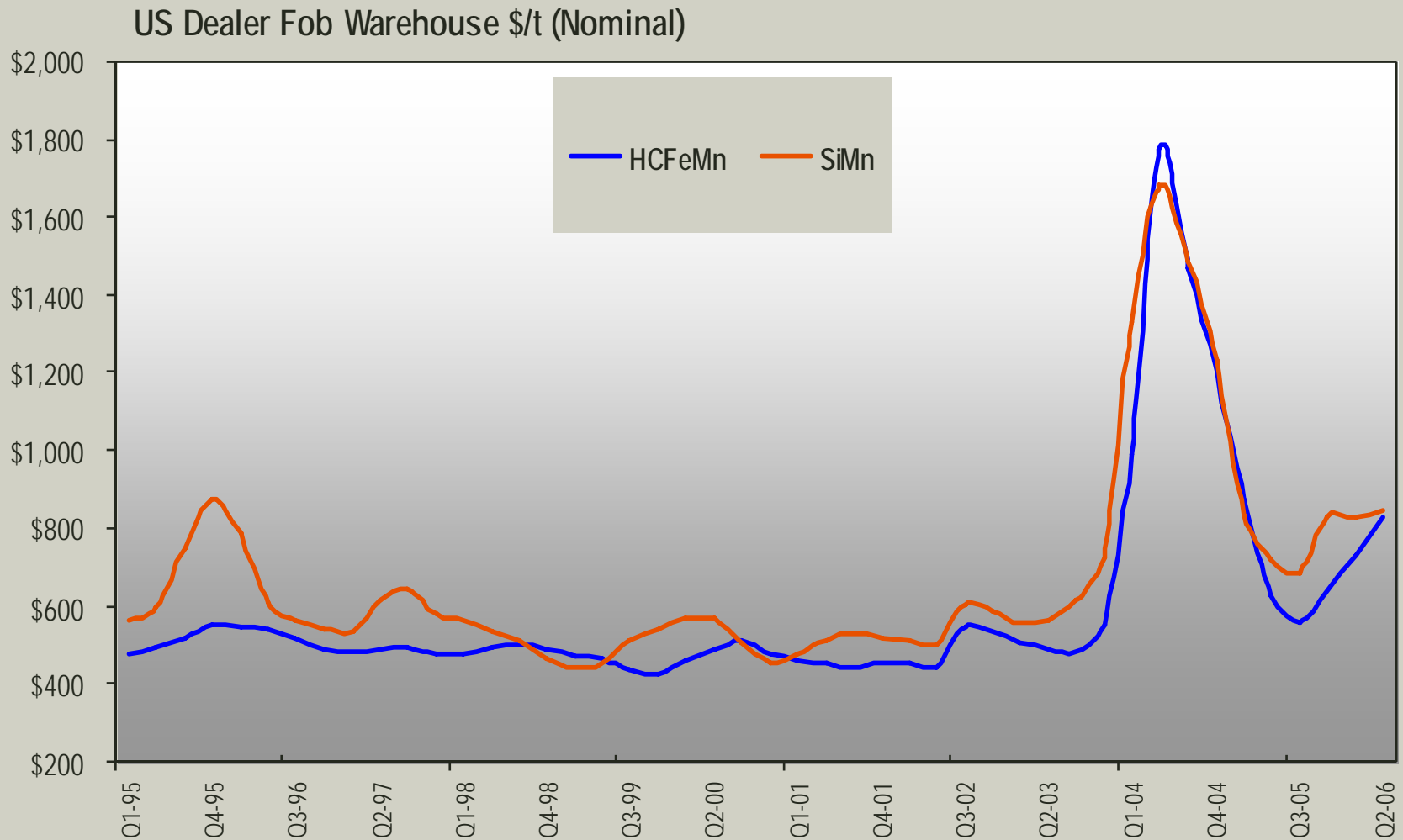
Average cost structure  
across major alloyers

# Comparative Electricity Prices

US mills/KWh



# Manganese Alloy Industry Pricing Trends



# Manganese Industry Overview

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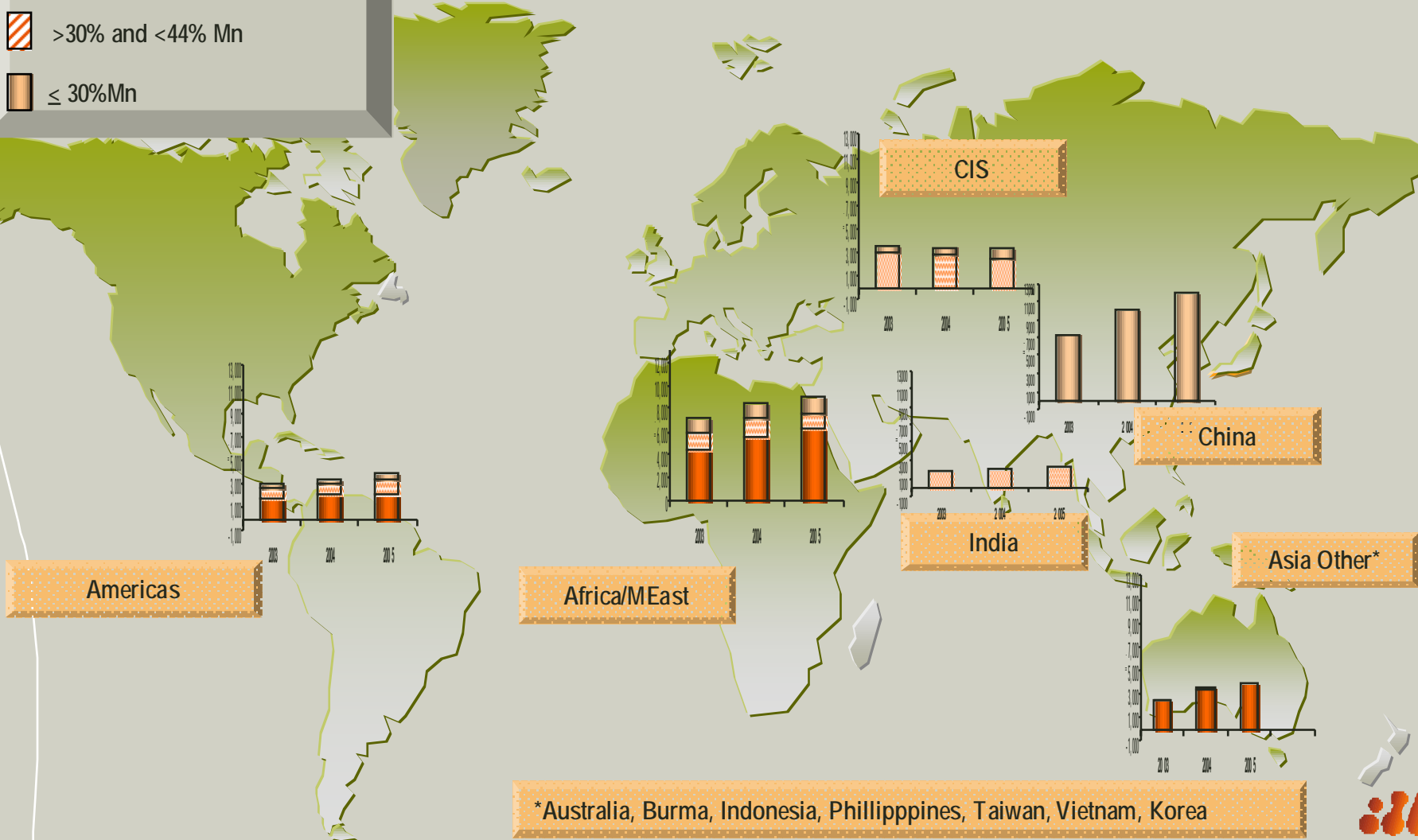
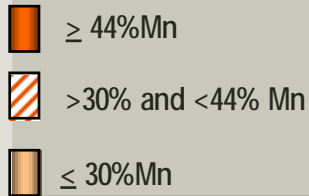
Manganese Alloy Industry

Manganese Ore Industry

BHP Billiton Manganese

# World Manganese Ore Supply

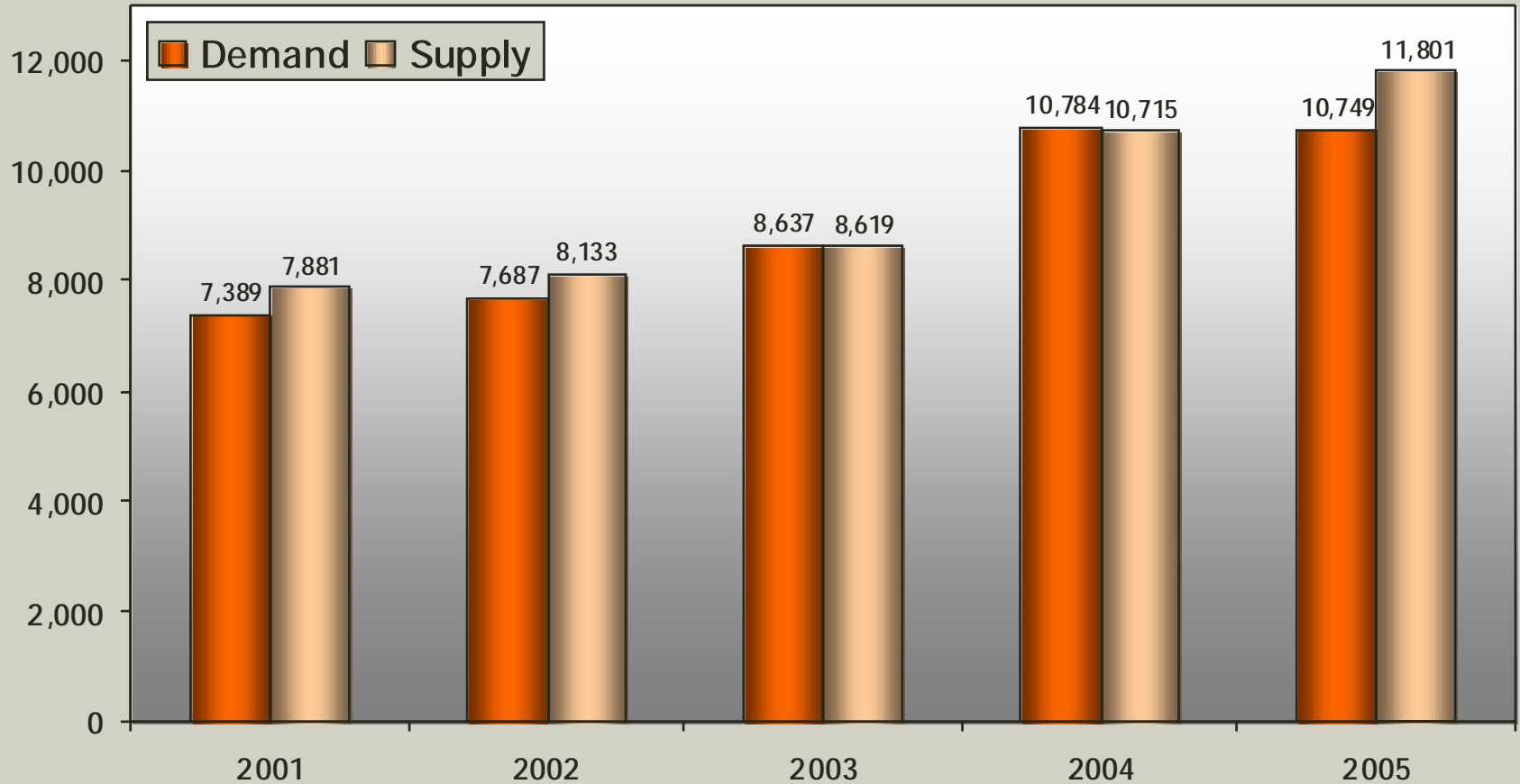
25.5 Mt ore In 2003 --> 29.8 Mt ore in 2004



\*Australia, Burma, Indonesia, Phillippines, Taiwan, Vietnam, Korea

# Manganese Ore Supply/Demand

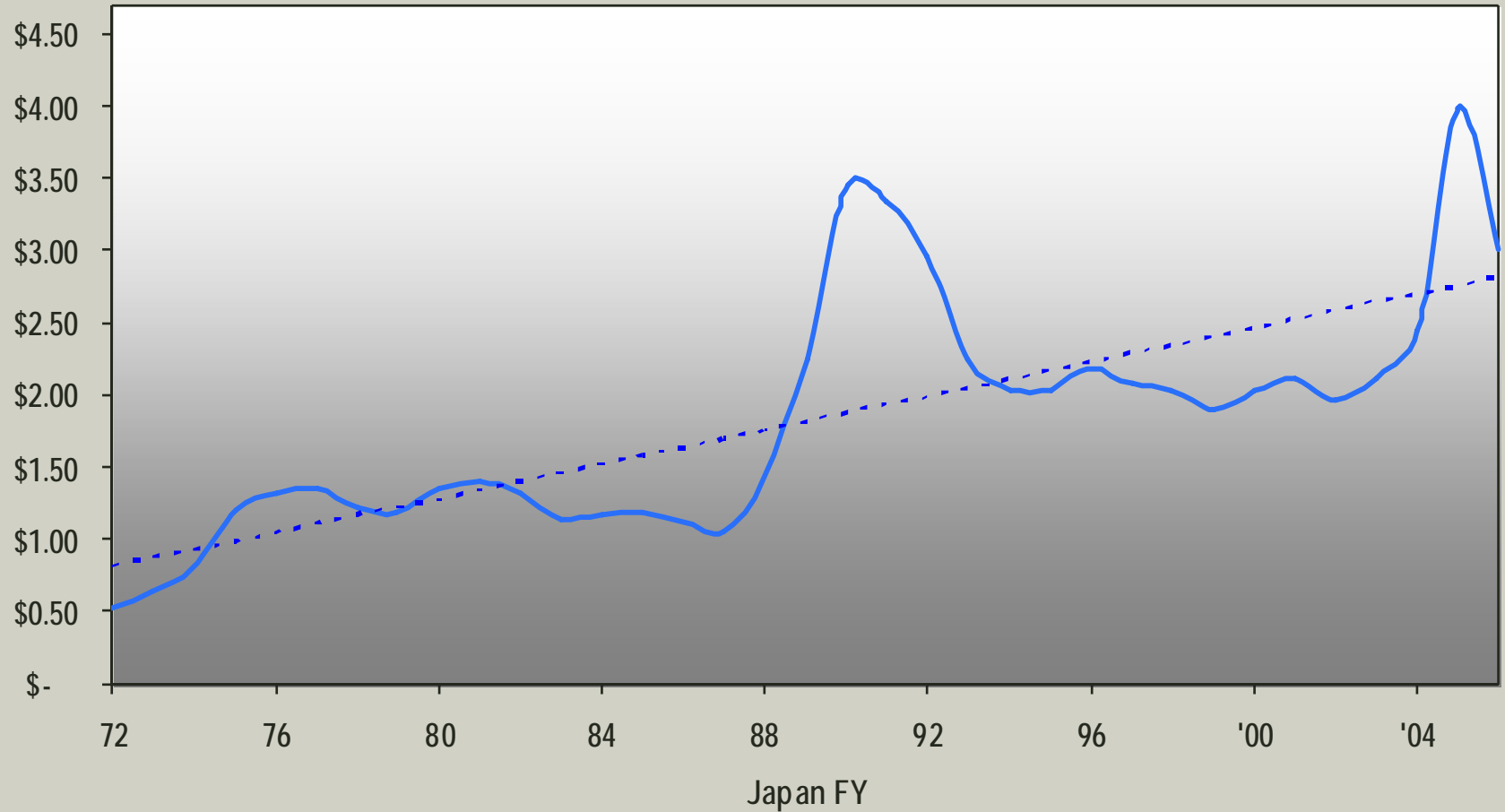
'000 tons Mn contained





# Manganese Ore Industry Price Trends

\$/mtu (Fob, 48% Mn)



# Manganese Industry Overview

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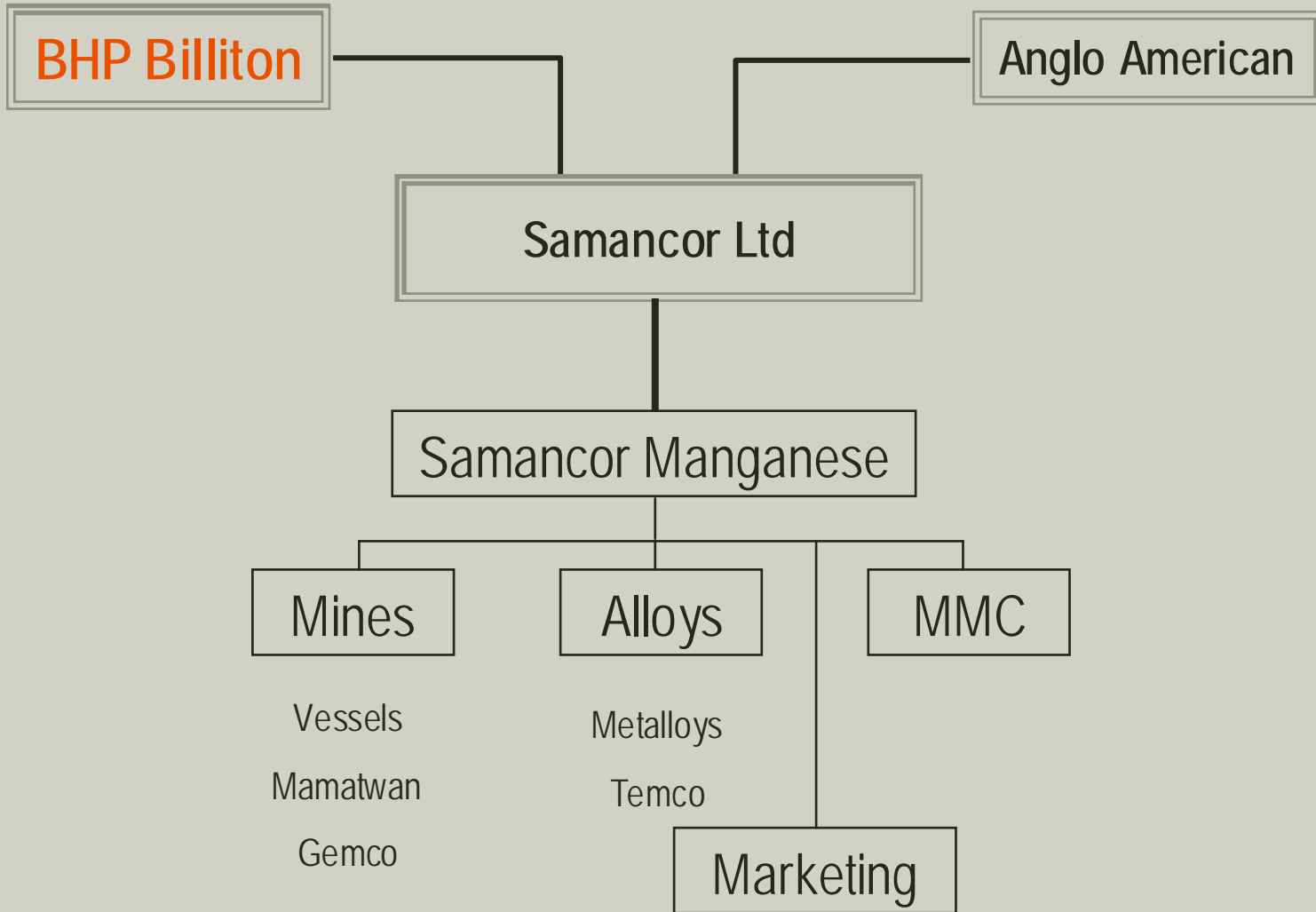
Crude Steel

Manganese Alloy Industry

Manganese Ore Industry

BHP Billiton Manganese

# Management Structure



# Business Overview

## Samancor Operations

Ore

Ferroalloy



Mamatwan 2Mtpa

Wessels 1Mtpa

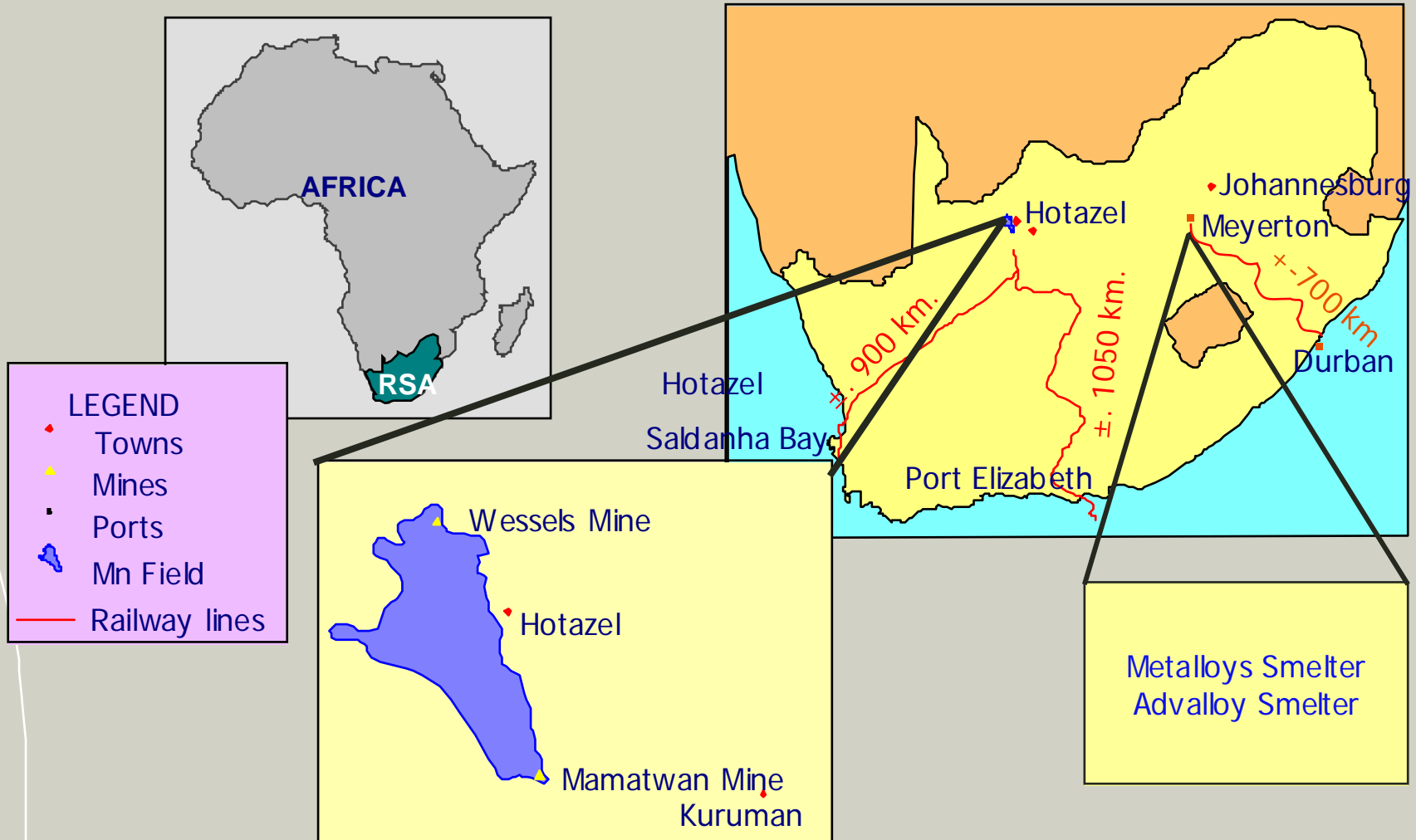
GEMCO 3.2Mtpa



TEMCO  
SiMn 120ktpa  
FeMn 130ktpa  
Sinter 330ktpa

# Business Overview

## South African Operations



# Business Overview

## Australian Operations



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# Mn Resource base – June 2005

CSM Manganese deposits	JORC resources (Mt)	JORC reserves (Mt)	Reserve life (years)
GEMCO (Australia)	173.3	103.5	15.7
Wessels (South Africa)	24.7	12.5	17.9
Mamatwan (South Africa)	69.3	38.5	12.8

LOM based on ROM tonnes:

- GEMCO 6.6Mtpa,
- Wessels (HG only) 0.7 Mtpa,
- Mamatwan 3.0 Mtpa



## Metalloys / Advalloy

### 7 Furnaces

82MVA SiMn (4F)  
2x75MVA FeMn  
1x81MVA FeMn  
MC Converter

### Capacity

390,000tpa FeMn  
100,000tpa SiMn  
75,000tpa MCFeMn



## Temco

### 4 Furnaces

33MVA FeMn/SiMn  
36MVA FeMn/SiMn  
54MVA SiMn  
3x15MVA SiMn  
1000tpd Sinter Plant

### Capacity

130,000tpa FeMn  
120,000tpa SiMn  
330,000tpa Sinter



## In conclusion....

BHP Billiton via Samancor is:

- A producer of High Grade Manganese Ore
- An Integrated Alloyer ⇒ supplying the global market with high quality Manganese alloy products, such as MCFeMn, HCFeMn & SiMn over the long term
- Backed by long life reserves providing a sustainable future



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