

# Supporting India's Emerging Steel Industry via the Provision of High Quality Raw Materials



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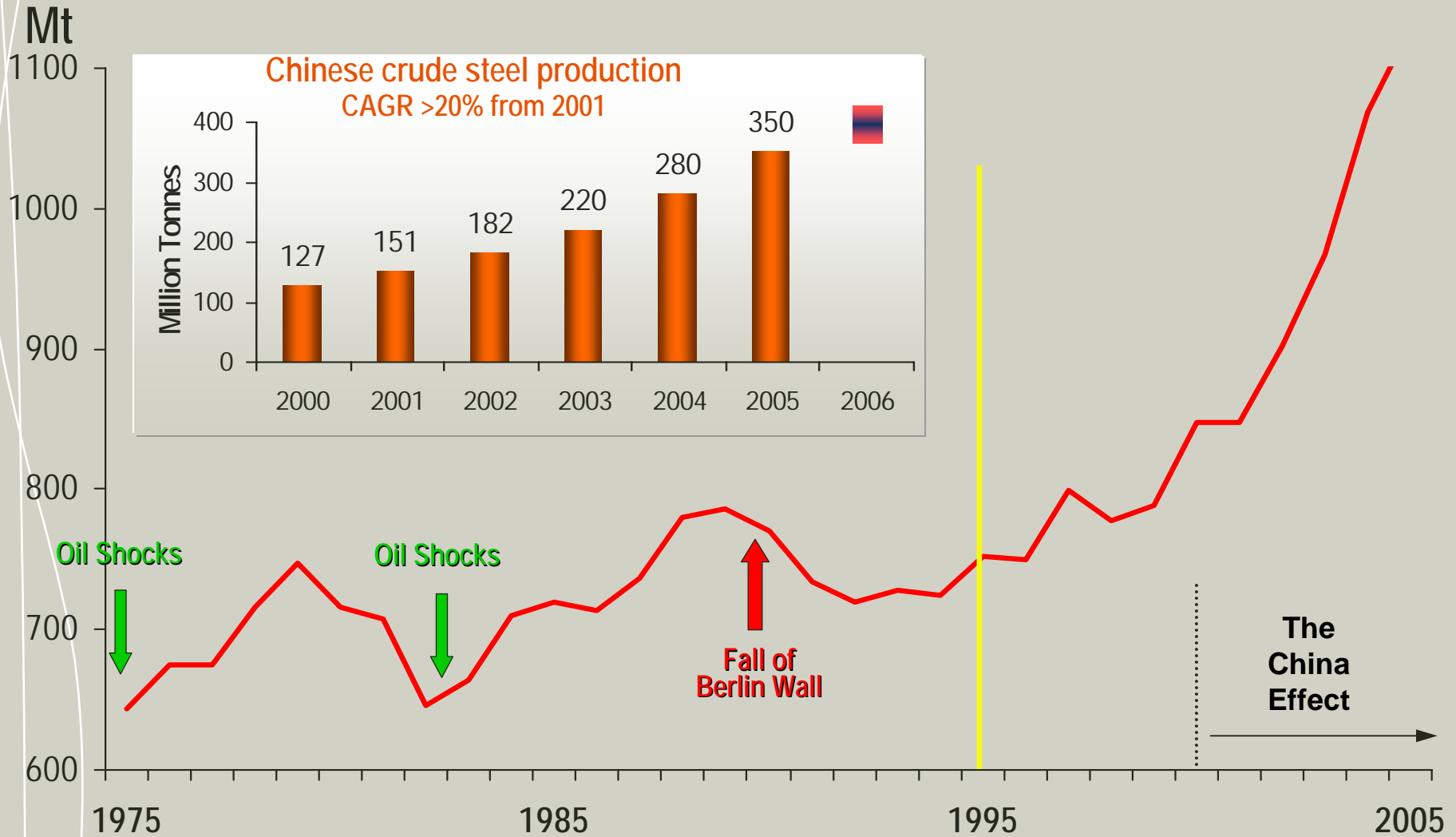


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# The global steel industry continues to power on led by China



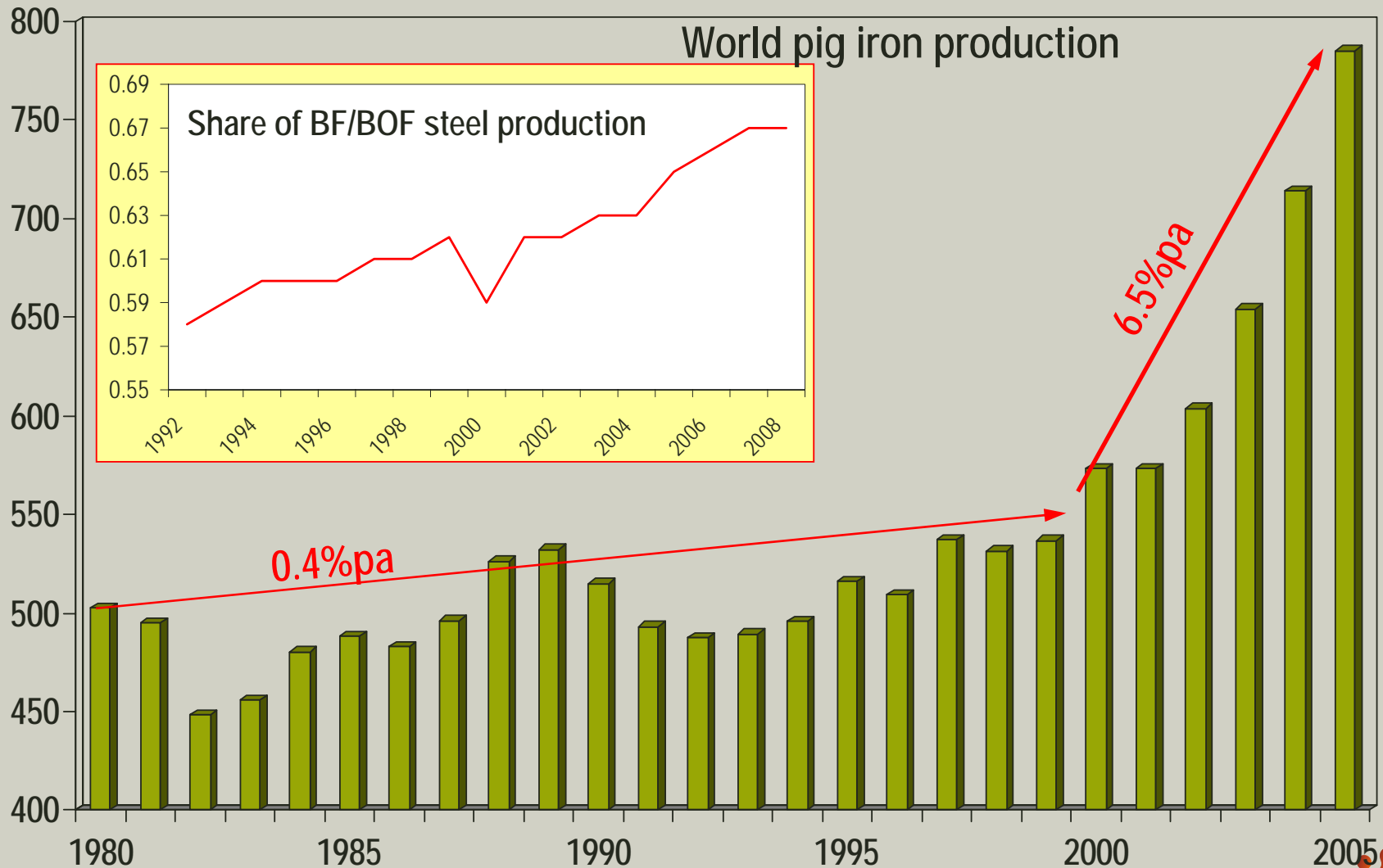
Source IISI, BHP Billiton

AAGR 0.6%

AAGR 4.6%



# Metallurgical coal based steel production has entered a new growth phase

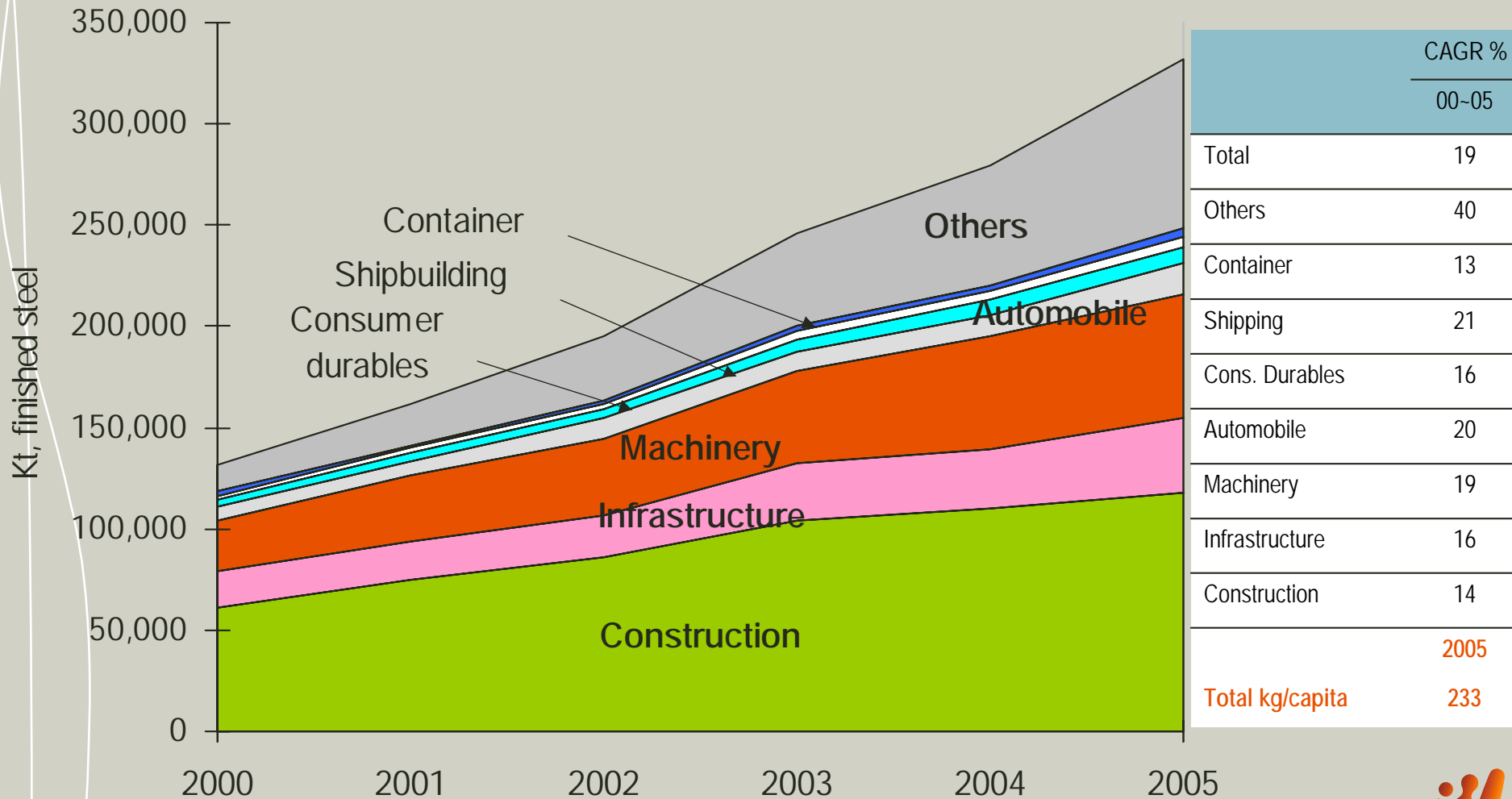


# China's steel demand sustained strong growth



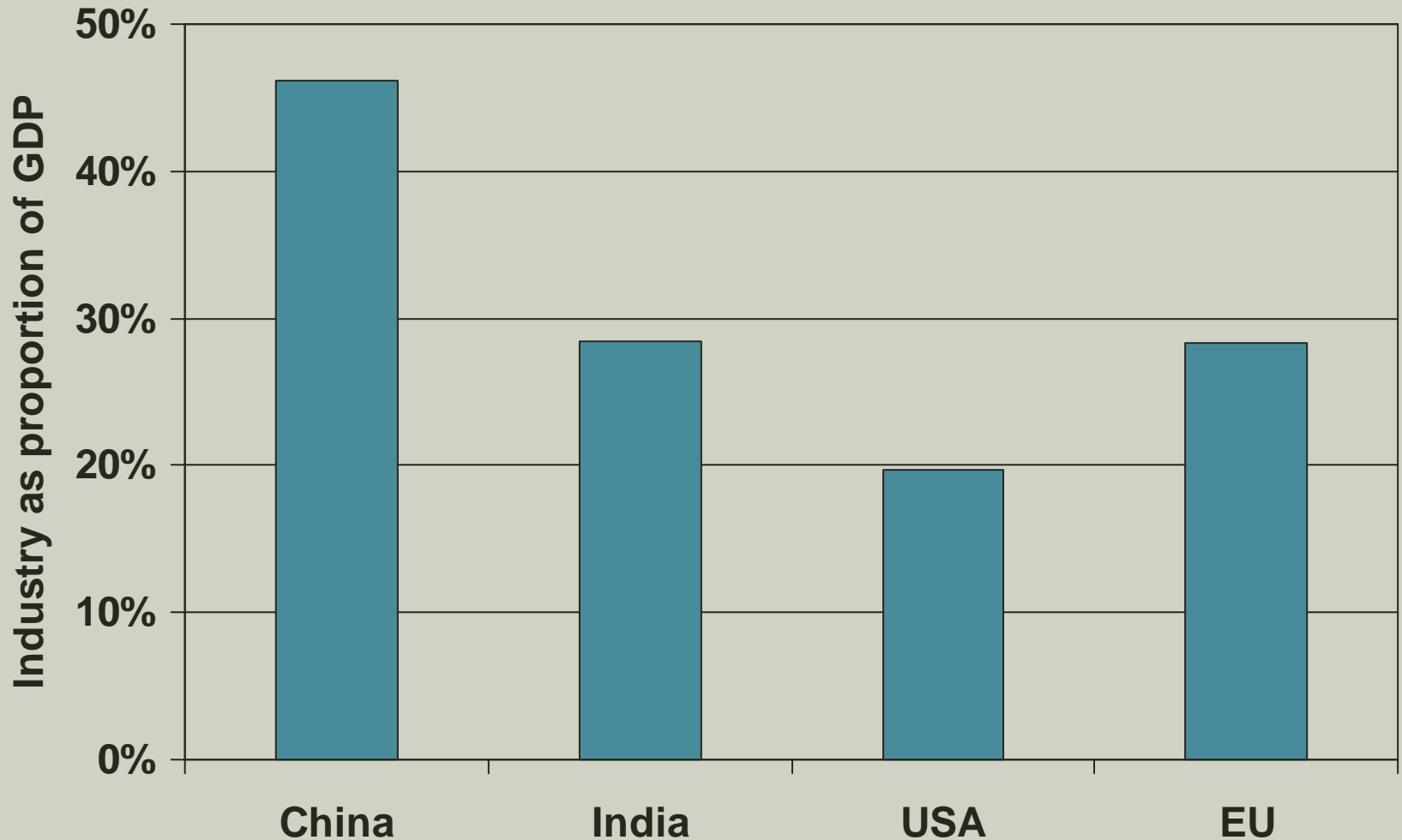
# Demand driven by construction, infrastructure & machinery

## China Steel Demand by End Use Sectors



Source IISI, CRU, BHP Billiton

# As infrastructure and manufacturing remain very important

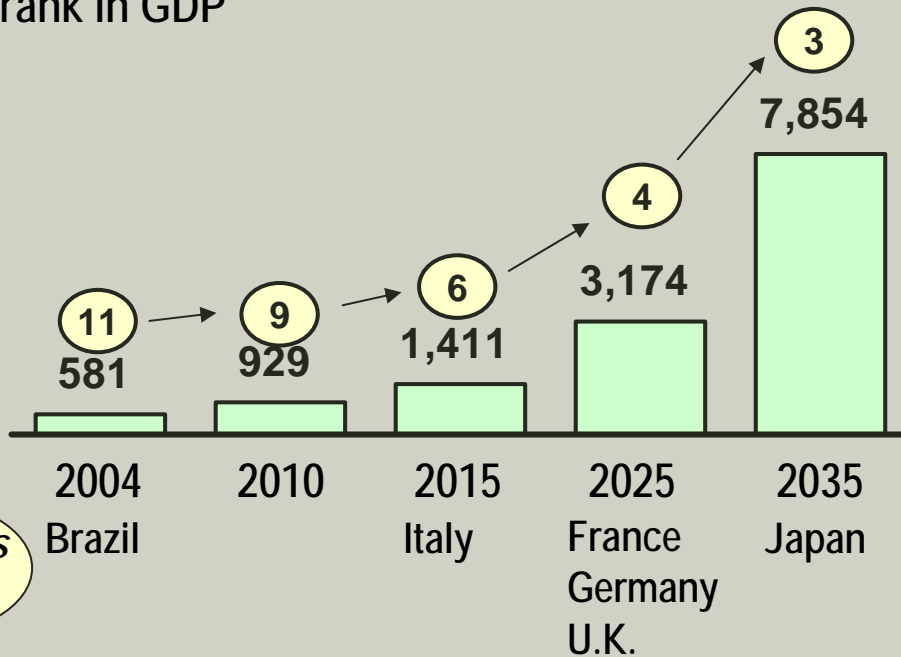


# India is set to be an economic super power of the 21<sup>st</sup> century

India is set to become a top four global economy within two decades...

Real GDP\*, US\$ billion

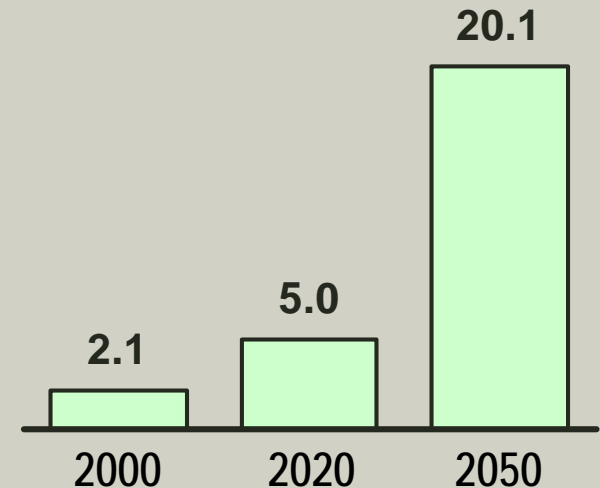
○ India's rank in GDP



Goldman Sach's BRICs report assumes India GDP growth of ~8% p.a.  
 Even by conservative estimates of (6% p.a.), India will be top 5 economy by 2025

...and contribute a giant share of the incremental GDP growth amongst major world economies\*\*

Per cent

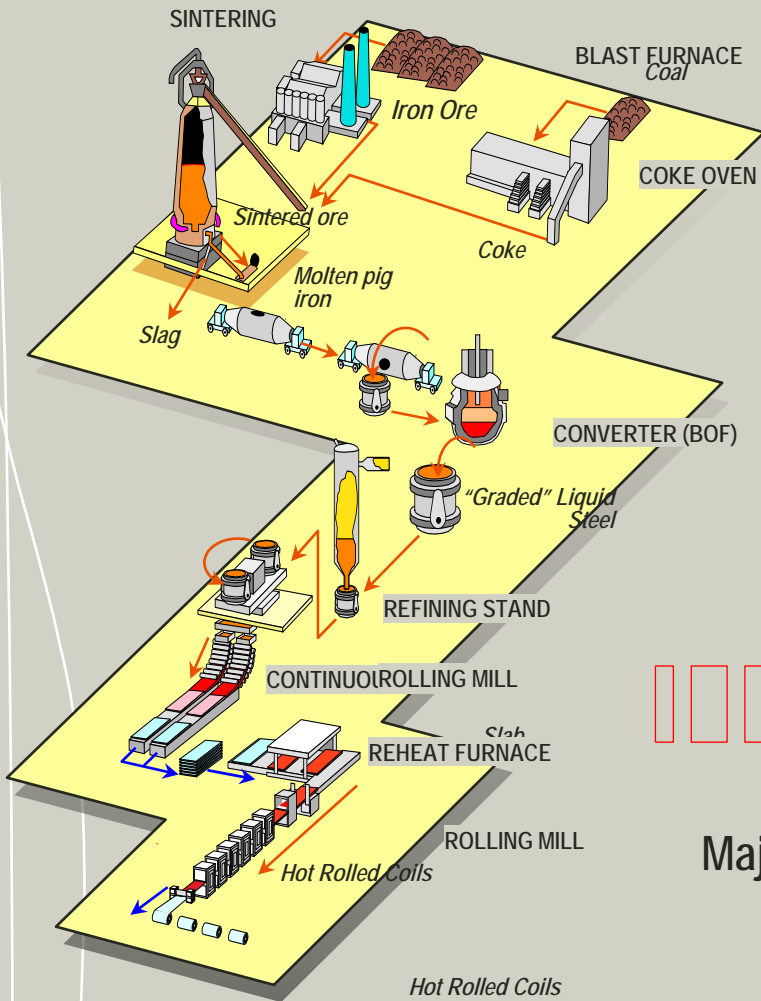


\* Base year 2002

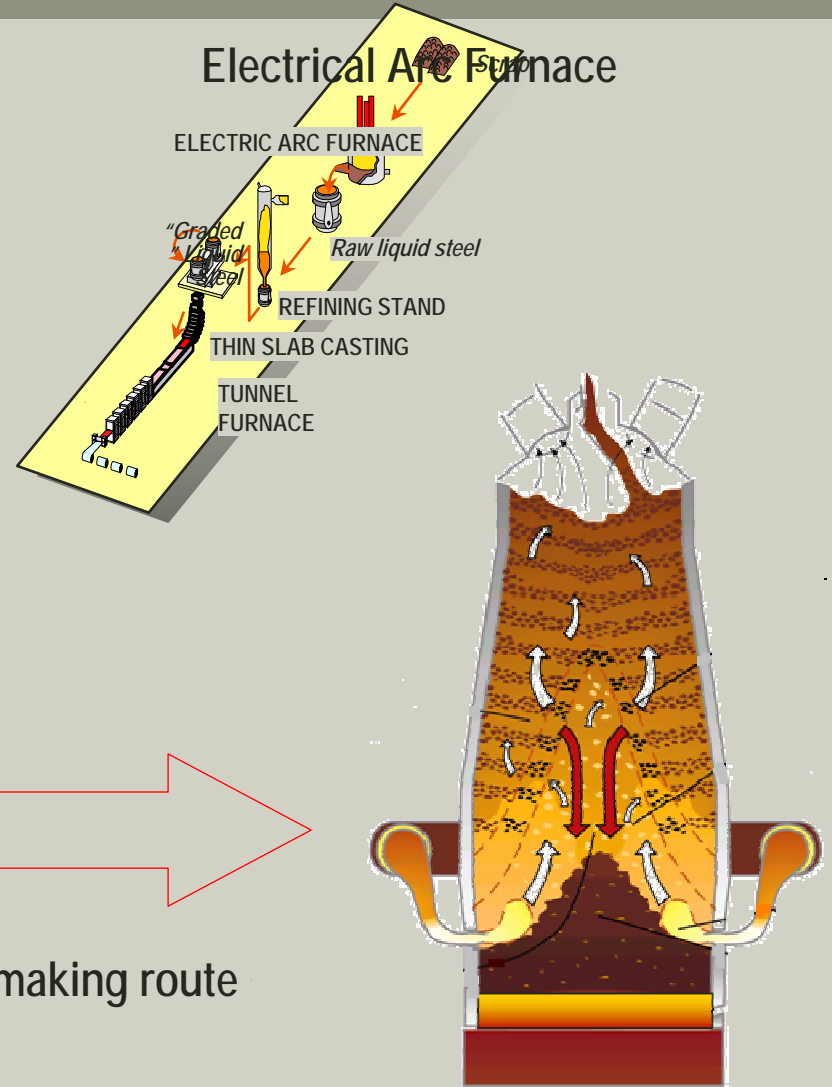
\*\* Major world economies considered are the BRIC and G6 countries

# Steelmaking Processes – India should favour BF route



## Basic Oxygen Furnace



## Electrical Arc Furnace



Major steelmaking route

 Liquid flow  
 Gas flow - coke

# Advantages of BF based steelmaking for India

- Ability to utilise vast Indian iron ore reserves
  - Lump and fines
- Can make full range of steels
  - Construction to Advanced High Strength steels
- Economies of scale
  - MBF to  $>5,000\text{m}^3$
- Energy efficiency
  - Significant efficiency gains, greenhouse benefits
  - Further options can be developed
- India well experienced with BF technology

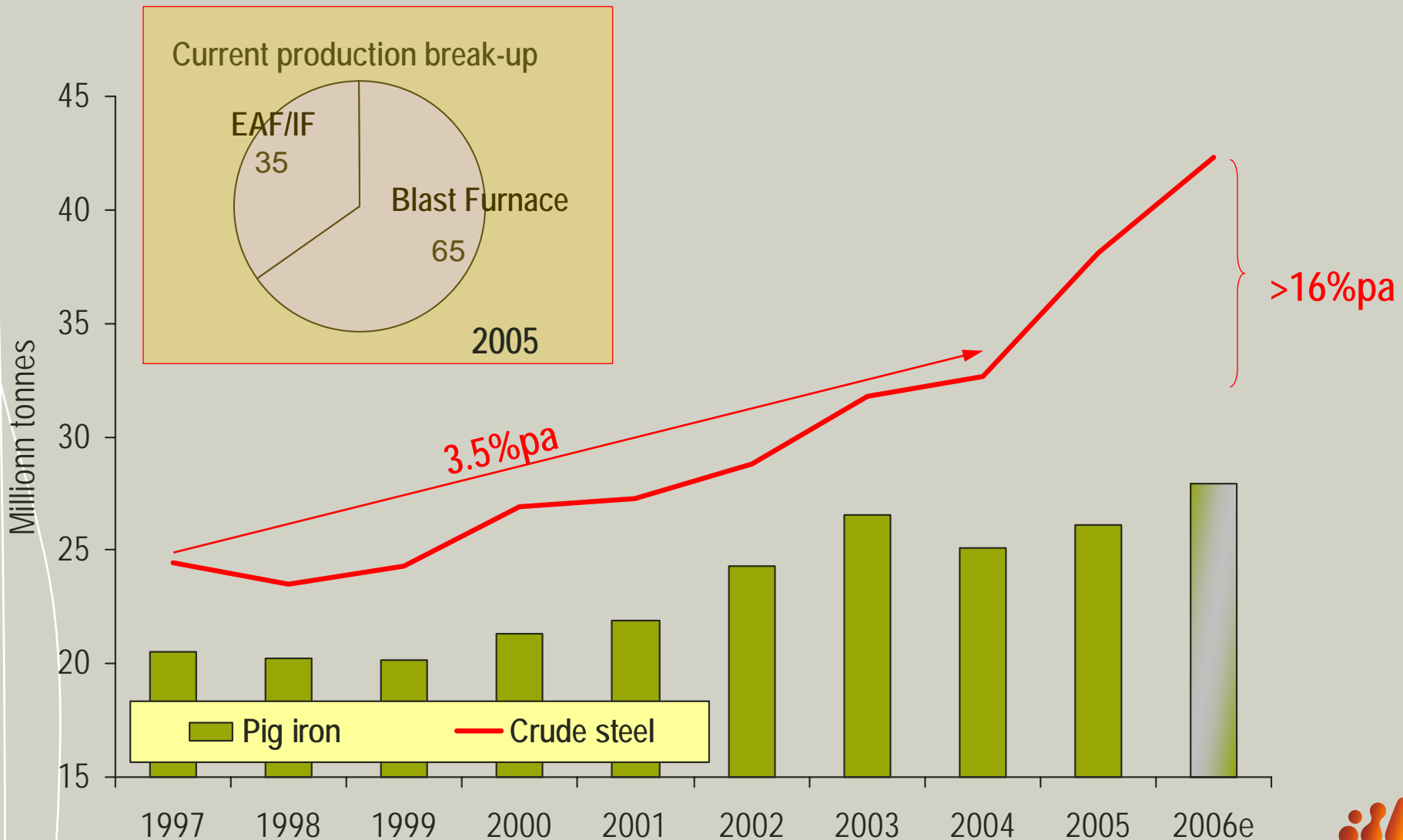
# Meeting India's future steel needs

## Requirements

1. Vibrant local steel industry
2. World class domestic mining industry
3. Supplies of excellent hard coking coal

*BHP Billiton can provide assistance with 2 and 3 leading to the further development of a successful vibrant steel industry*

# India's steel production has also grown...accelerating??



# Indian steel industry structure – predominantly private

## Players

## Production Mtpa 2005

## Technical/ equipment

## Products and Markets

ISP

SAIL  
Bhilai  
Bokaro  
Durgapur  
Rourkela  
TISCO  
RINL

4.9  
4.1  
2.0  
1.8  
4.5  
4

Complex production flow  
(Blast furnaced → Basic  
oxygen → Furnace →  
Casting Rolling)

Wide variety of flat and long  
products including higher  
value-added products  
  
Domestic and International  
  
Control 50% of steel  
production

Steel  
Majors

ESSAR  
JVSL  
ISPAT  
OTHERs/EAF\*

3  
2.4  
2.4  
8.8

EAF/ Planning Corex unit  
Corex / Blast Furnace  
EAF / Blast Furnace  
Small EAF units

Mainly high value flat  
products  
  
Domestic and International

MBF

Pig iron unit – 15

2.5

Blast Furnace producing  
pig iron

Castings,  
foundries, rolling  
mills

Sponge  
Iron/Rollers

Sponge Iron – 31  
Re-rolling – 2080  
HR – 7  
CR – 59  
GP/GC – 14  
TIN plating – 2

10  
22.8  
6  
3.6  
1.4  
0.18

Single production line (/Electric  
Arc Furnace/ Induction  
Furnace → Rolling) or just Hot  
Rolling

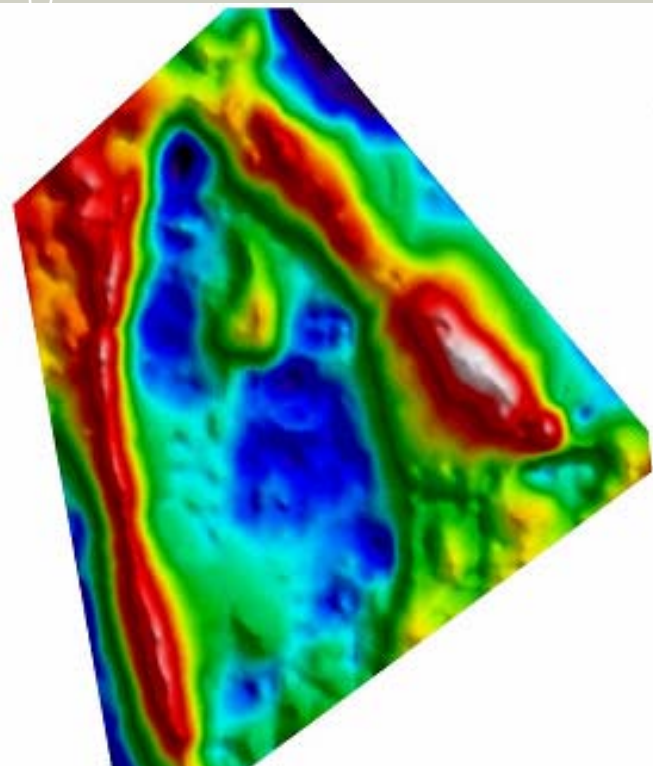
Mainly long products of  
low quality

Source India steel, JPC

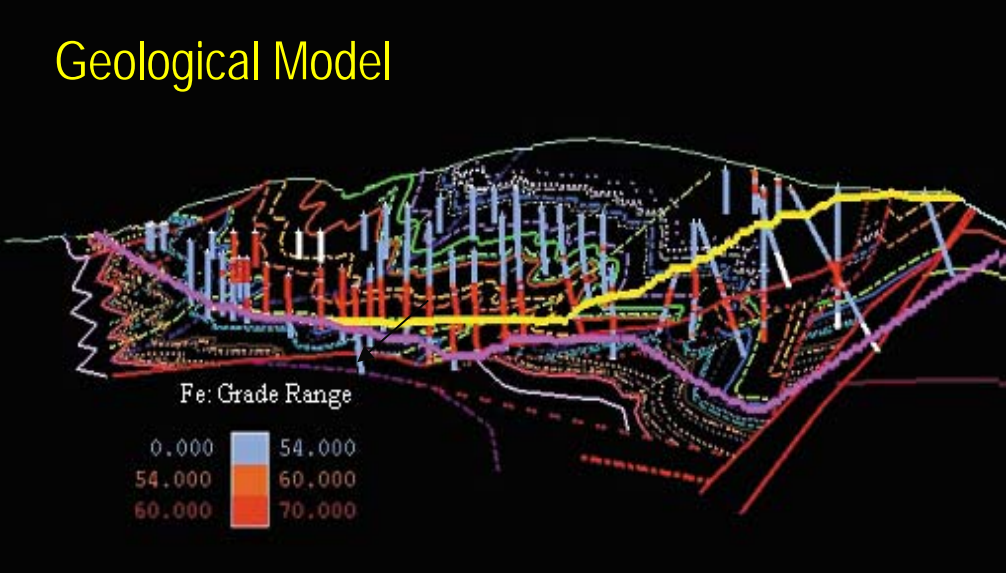
# Benefits from world class domestic mining industry

- Deep understanding of resource through state of the art exploration
- World class mining technologies
- Maximum utilisation of natural resources
- Environment and community development
- Infrastructure development
- Taxes and royalties to the state
- Merchant ore market promotes downstream industries
- Competitive downstream industries

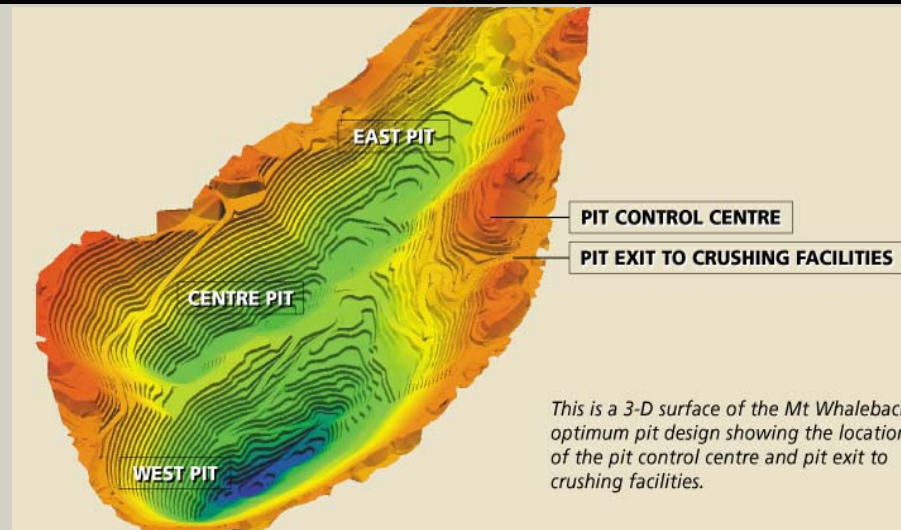
# Ensuring iron ore resources are maximised



Latest geophysical tools



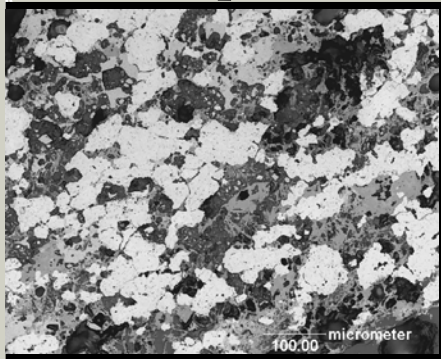
Deep drilling technology at fast rates



*This is a 3-D surface of the Mt Whaleback optimum pit design showing the location of the pit control centre and pit exit to crushing facilities.*

Detailed Mine Planning

# Developing world class technology for resource understanding



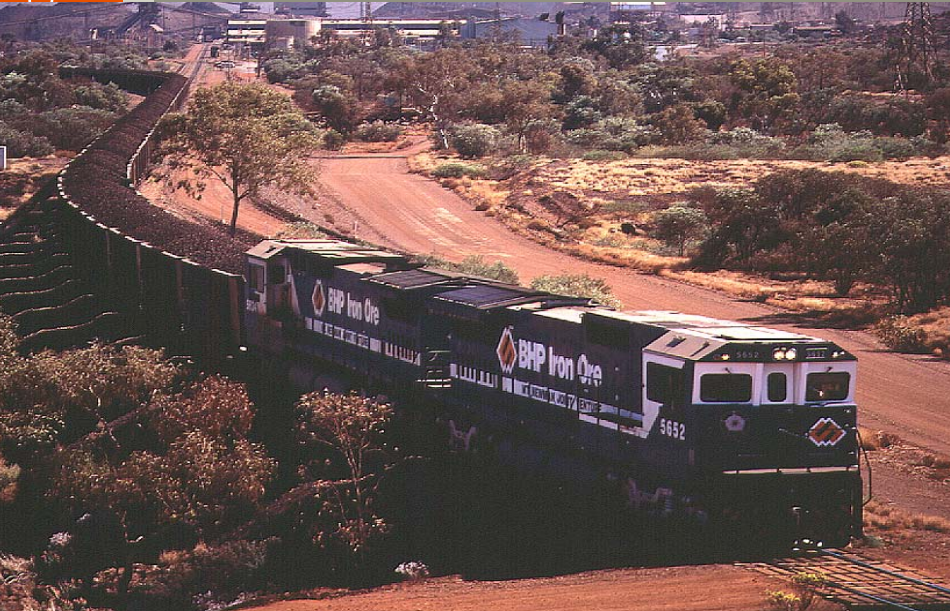
Fundamental studies are designed to understand the link between:

- GEOLOGY, the genesis and dispersal of ore types in the ground,
- MINERALOGY, the type and dispersal of mineral phases within the ore,
- the fundamental PROPERTIES of the ore ,
- and
- its BEHAVIOUR in use

giving the greatest potential for extracting the maximum value from the ore in sinter and ironmaking.



# Resource companies develop/operate world class infrastructure



Nelson Point

Finucane Island

- Logistics key to mineral utilisation and evacuation
- Dedicated heavy haul freight railways
- World record for longest and heaviest freight trains
- Transports 100 Mtpa on a single line
- World class port infrastructure

# Proving mining in a responsible environmental friendly manner

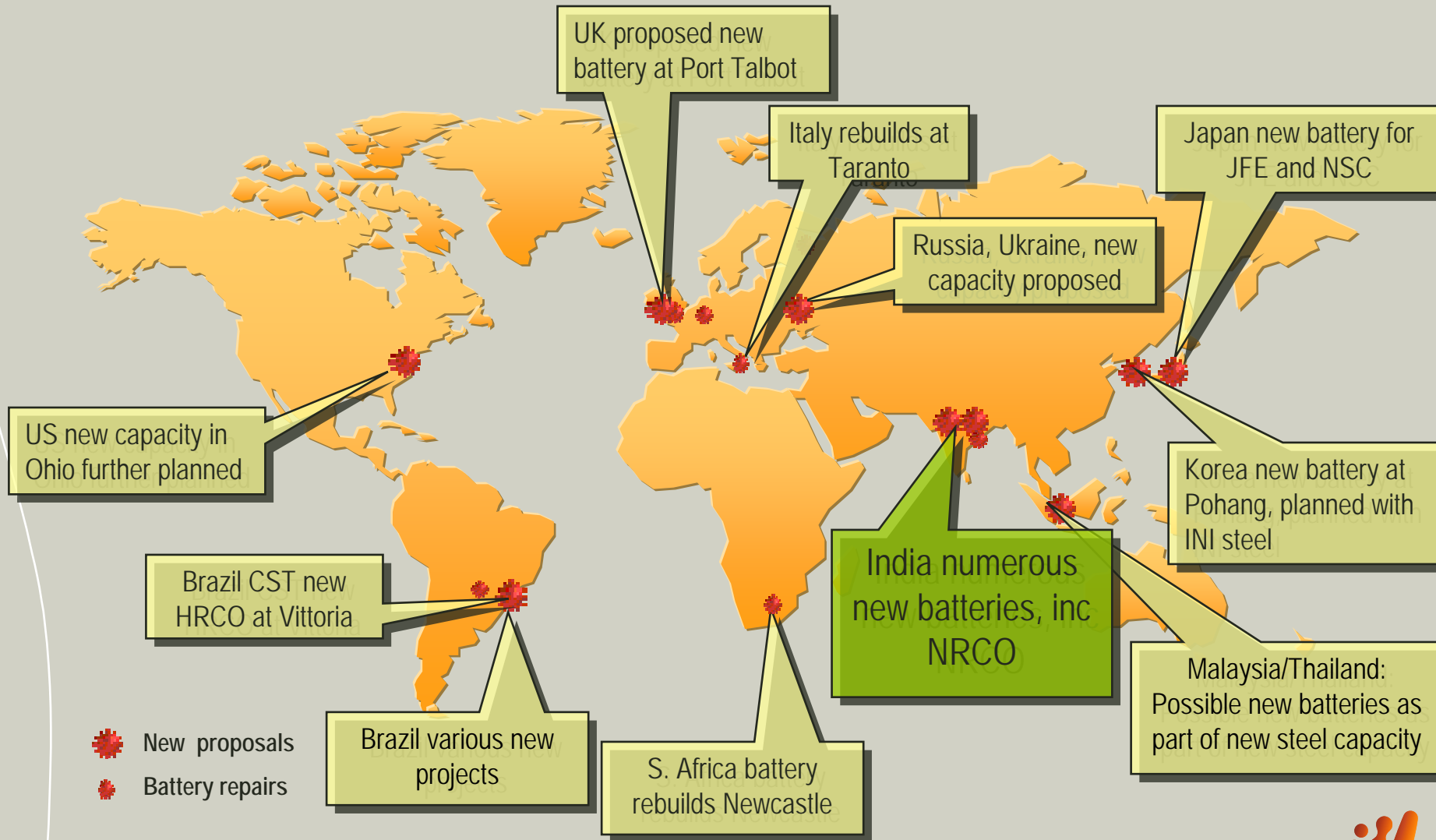


BHP Billiton Awarded "Company of the Year" in the Business in the Community Awards, 2005

# Trends in global met coal demand

- **New BF capacity and associated coke capacity planned**
  - China, India, Brazil & new integrated steel capacity in Asia eg Korea, Thailand
  - Significant relined and enlarged BF capacity planned
  - New batteries Japan, Korea – remove reliance on merchant market
- **Changes to seaborne balance due to declines in domestic production**
  - Germany
  - USA, esp. low volatile HCC
- **Rise of China as an important met coal importer in medium term**
  - New coastal capacity favouring seaborne imports
- **Move away from SSCC to HCC**
  - Larger, and high BF productivity requiring increased levels of high quality HCC
  - Kyoto supporting moves to lower fuel rates = move away from SSCC to HCC

# Traditional and new steelmakers are building / refurbishing and planning new coke capacity

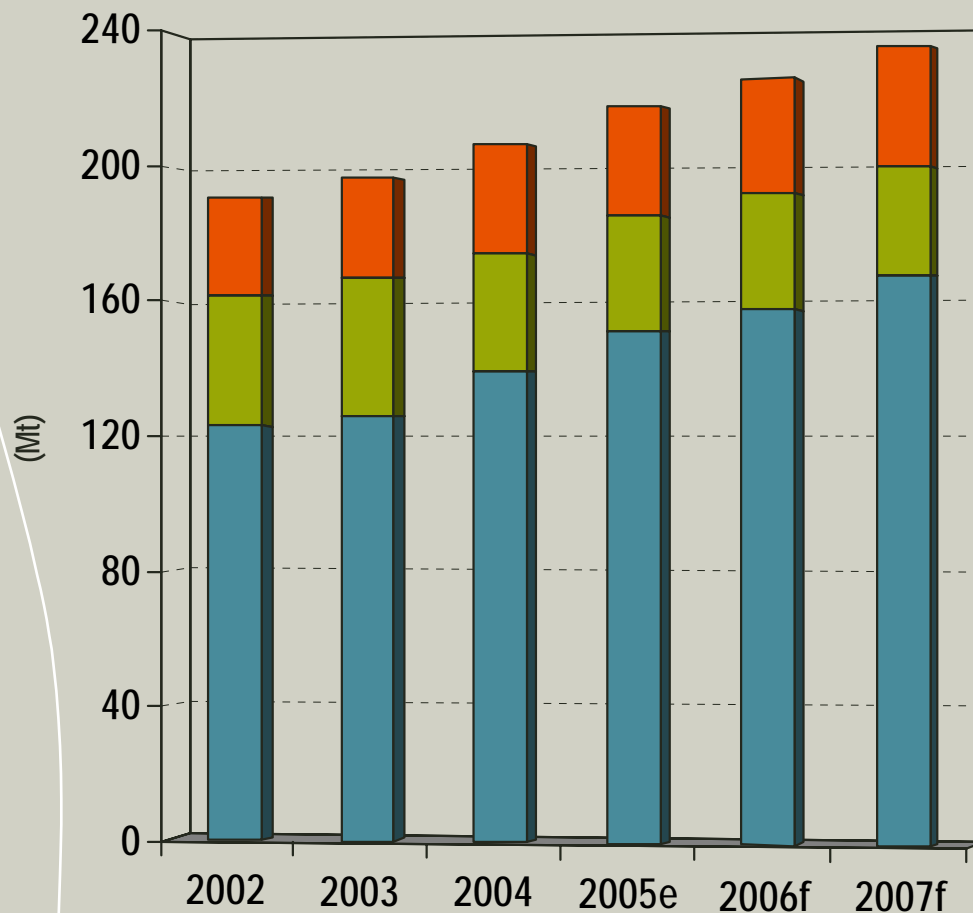


Source Market sources and announcements

# Global Increase in met coal demand 2006 - 2007

Total met coal increase 2004 - 7 approx 25Mt or (5%pa)

■ Hard Coking Coal ■ Semi-soft ■ PCI



PCI total increase +4Mt, (5.0%pa)

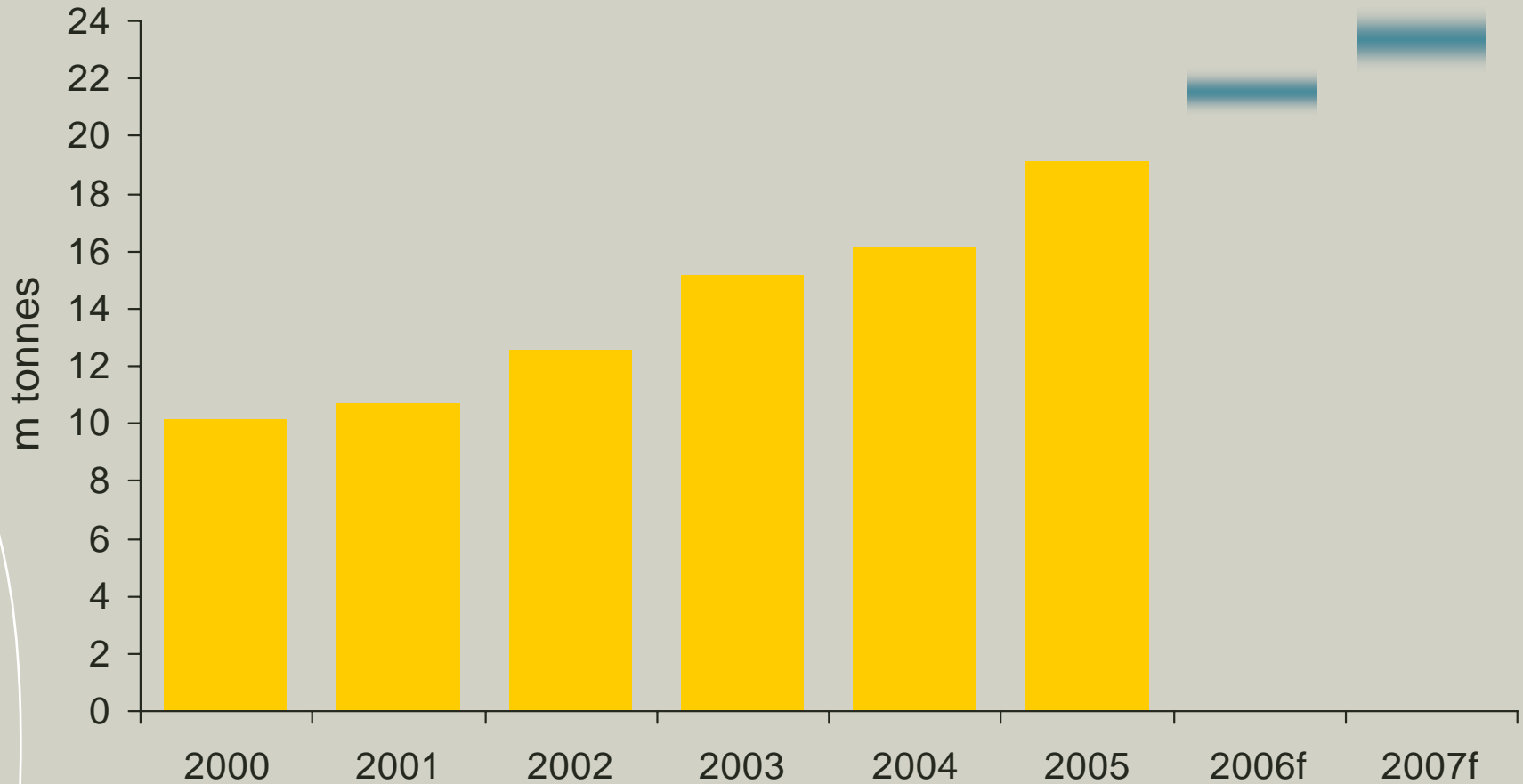
Semi-soft decrease -3Mt, (-3%pa)

Hard coking coal increase + 28Mt, (6.1%pa)

## Major met coal issues for India

- Need to import as local coals universally high ash
- New larger capacity BF's will require high quality coke
- Better coke needed in future due to
  - Increased PCI use to world practices
  - Strong increase in BF productivity
- New HRCO will still require hard coking coals
- Will stamp charging produce coke suitable for large high productivity BF's at  $>2.5\text{t}/\text{m}^3\cdot\text{day}$ ??

# India's met coal demand will continue to rise



Source: Trade statistics, CRU, McCloskey, BHP Billiton

# Major high quality global met coal producing regions

**USA - Appalachia**  
LV, MV, HV producer ~300km to coast  
Reserve depletion, rising costs and logistics challenges



**China - Shanxi Province**  
LV, MV, HV producer, 800km to coast  
Strong domestic demand, resource depletion, environmental, safety issues, skilled labour shortages, rising costs

**Canada - Elk Valley**  
LV, MV producer, 1200km to coast  
Logistics complex and partially constrained, rising costs

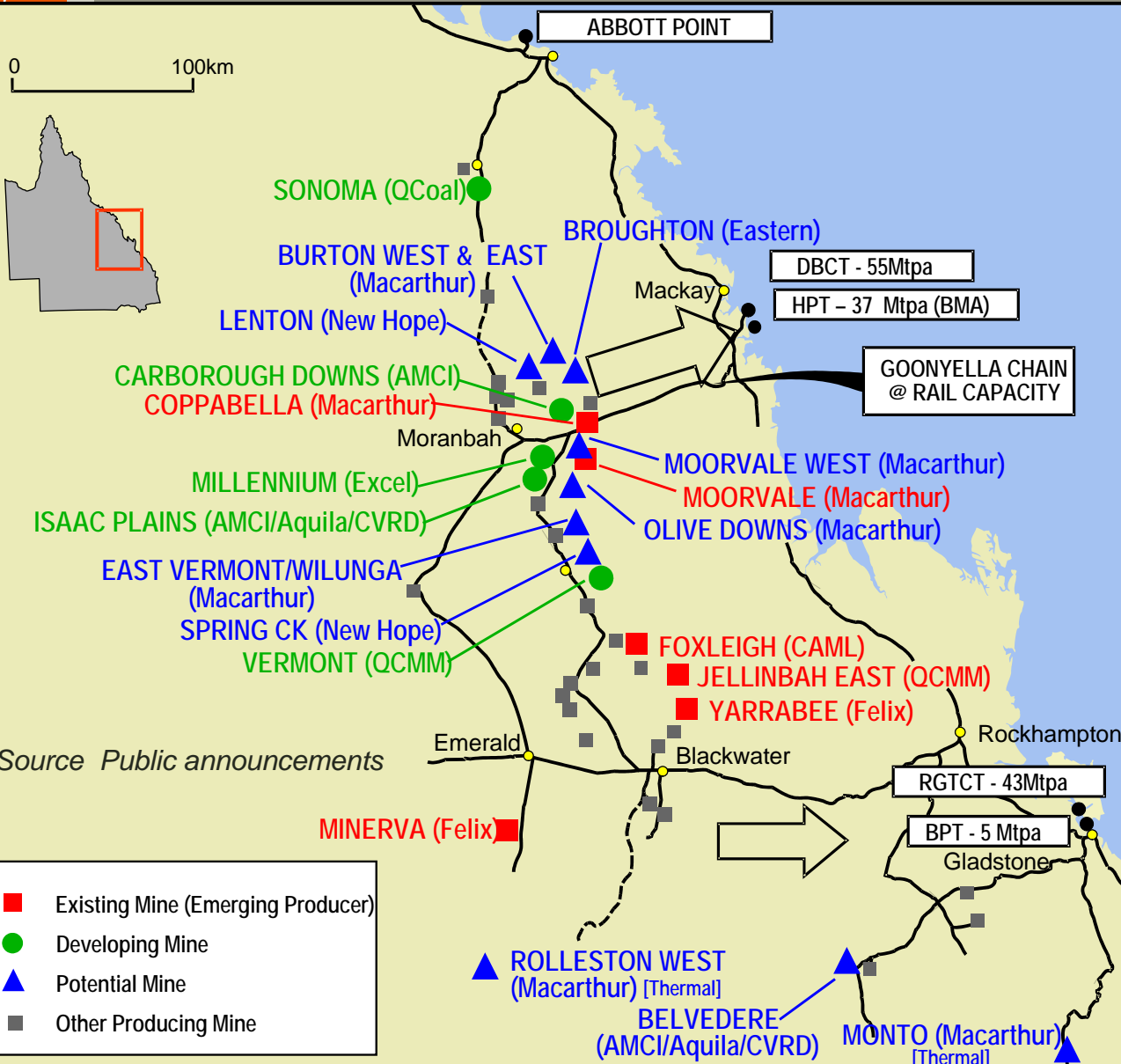
**Russia - Kuzbass**  
LV, MV, HV producer ~4000km to coast  
Limitations on infrastructure, dependent on subsidised rail transportation  
Strong domestic demand

**Australia - Bowen Basin**  
LV, MV, HV producer ~300km to coast  
Shortages of skilled labour, input costs rising, commissioning delays, port capacity



 Predominantly export  
 Predominantly domestic

# Queensland selected new projects



Australia and Canada

Majority of new projects are WCC/SSCC and PCI coals

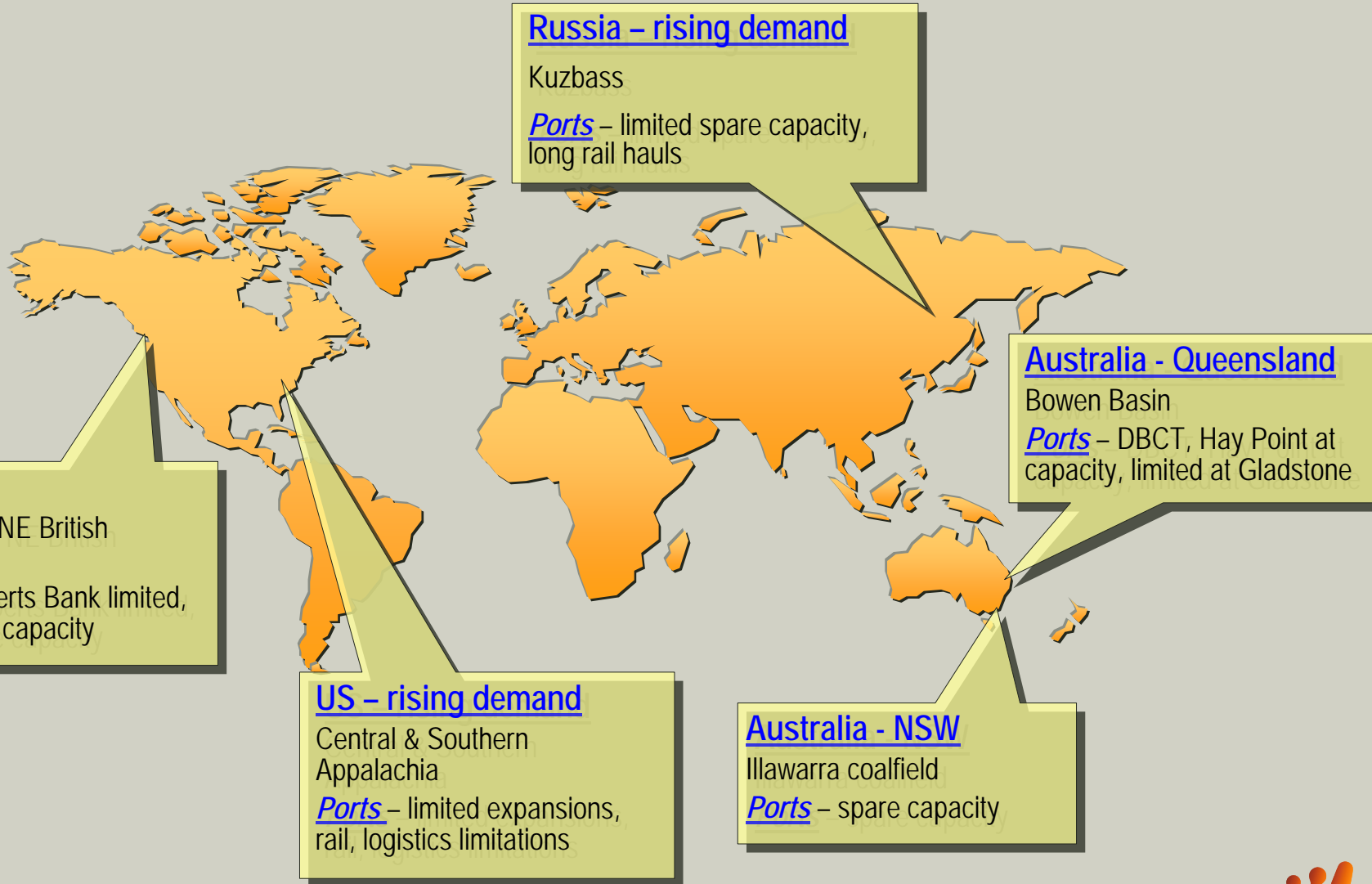
# Met Coal Supply Outlook to 2007

- **Australia** (62% of global total)
  - Exports up strongly
  - Further additional supply from Hail Creek, Dendrobrium, Broadmeadows other HCC
  - Brownfield creep/expansions
  - Delayed new capacity expansions
- **Canada** (16% of global total)
  - Exports increasing from 2004/5
  - New capacity NE British Columbia, but mainly PCI, WCC or poorer HCC
  - Ramp up Alberta, Cheviot, Grande Cache
  - Possible restarts - brownfield expansions
- **USA** (12% of global total)
  - Difficult to predict after rise in 2004/5
  - Outlook further decline, ~ 3-5Mt by 2007
  - Possible decrease in HV – power linked
  - High cost producer
- **China**
  - Little HCC exported
  - Probable shortage of domestic HCC in future
  - Counterbalance high domestic demand with export desires – China first
  - Shanxi Province key - hard to predict
- **Russia**
  - Exports predicted to rise to 2007
  - Domestic demand growth/supply tightening
  - Most HCC owned by steelmakers
  - Further potential, but domestic demand rising exports secondary – price sensitive
  - Production costs low but very low rail freights vital

## Key Takeaways

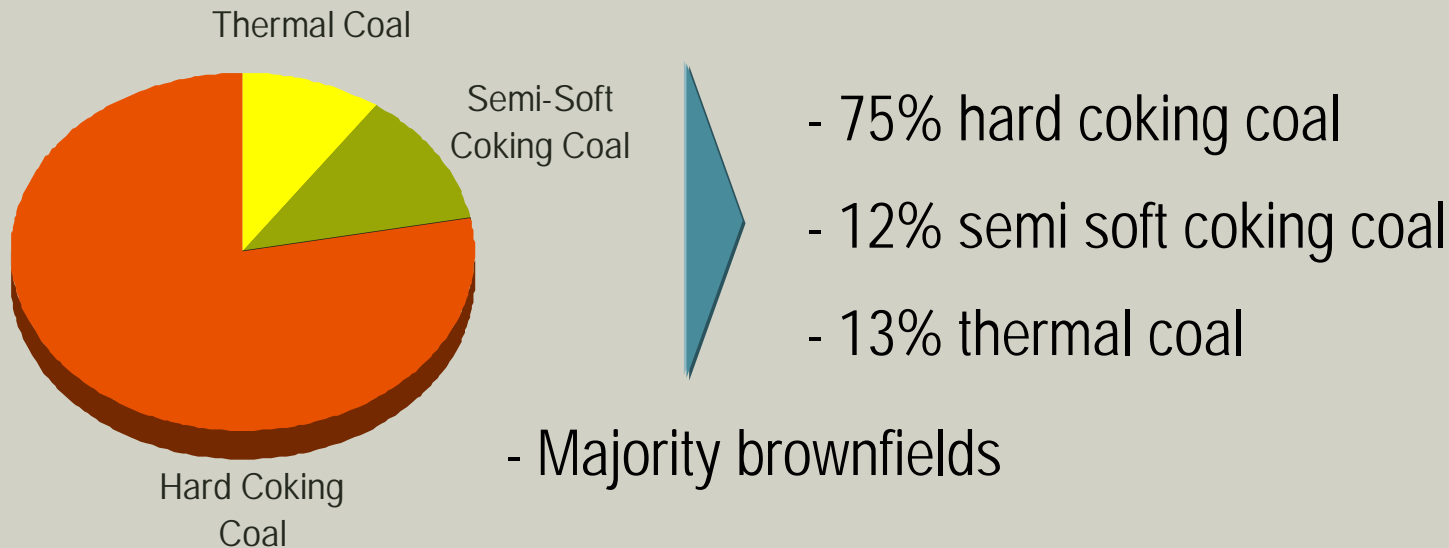
- Continued importance of Australia especially in better quality HCC
- Port throughput not mine production the key to export volumes in near term
- Supply becoming more volatile

# Port and rail capacity is the key in the short term



# BHP Billiton has numerous growth opportunities to meet market demand

***BHP Billiton Bowen Basin expansions contribute the majority of the growth, predominantly high quality hard coking coal announced Q3 2004***



## Capacity growth based on:-

- brown & greenfield expansions in Bowen Basin
- replacement new longwall and potential expansions in Illawarra
- new coking coal basin in Kalimantan, Maruwai

# BHP Billiton's expansion progress Queensland – Bowen Basin

- Queensland Stage 1 expansion from 52 to 57 Mtpa completed
- Queensland Stage 2 (to 59 Mtpa) underway & due by 2<sup>nd</sup> half 2006
- Broadmeadow long wall commenced production August 2005
- Poitrel open cut approved and under construction
- Expansion of capacity at Hay Point Coal Terminal on track :
  - Phase 1 to 40 Mtpa (+6) by 2<sup>nd</sup> half 2006 – underway
  - Phase 2 to 44 Mtpa by 1<sup>st</sup> qtr 2007 – announced
  - Phases 3&4 to 55-57 Mtpa – being assessed & environ approvals sought.
- Currently evaluating range of further options for expansion subject to market demand and constraints imposed by the current environment
  - resource shortages, lack of skills people and significant cost pressures

# BHP Billiton's expansion progress Broadmeadow – commenced production August 2005



# BHP Billiton's expansion progress Poitrel mine



Crushing station



Surge bin



Ultra-fines microcell tanks



Poitrel rail loop

*Note: Poitrel mine is a JV with infrastructure sharing*

# BHP Billiton's expansion progress

## Expansion of existing operations

Construction of new Blackwater CPP



Expansion of Saraji CPP



Expansion of Hay Point



Additional contract stripping



# BHP Billiton's expansion progress Illawarra and Maruwai

- Dendrobium UG mine commenced production April 2005



- Further expansion options at Illawarra under feasibility study
- Maruwai moved into feasibility study stage.

## Concluding Remarks

- The global steel industry remains on a fast growth track, is India joining in?
- The challenges of meeting India's "need for steel" can be met with the support of local and major resources companies such as BHP Billiton
- Development of India's vast iron ore resources would benefit from state of the art exploration, mining and resource utilisation technologies
- BF based steelmaking is the optimal solution for India's steel needs requiring imported met coal
- The outlook for met coal esp. hard coking coal is strong and challenges to meet market demand are faced by all major producing regions
- BHP Billiton are fully committed to meeting the growth for coking coal, delivering India the confidence and assurance for its future steel needs



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