## Olympic Dam Analyst Presentation

Roxby Downs, South Australia

14 December 2006



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### Agenda

## Copper and Uranium Marketing

John Crofts - Marketing Director - Base Metals

## Olympic Dam Expansion

Roger Higgins - VP and Chief Operating Officer

## Olympic Dam Overview Finance

- Dean Dalla Valle Asset Leader
- Paul Dunn VP Finance



## Copper Marketing

John Crofts Marketing Director Base Metals

14 December 2006



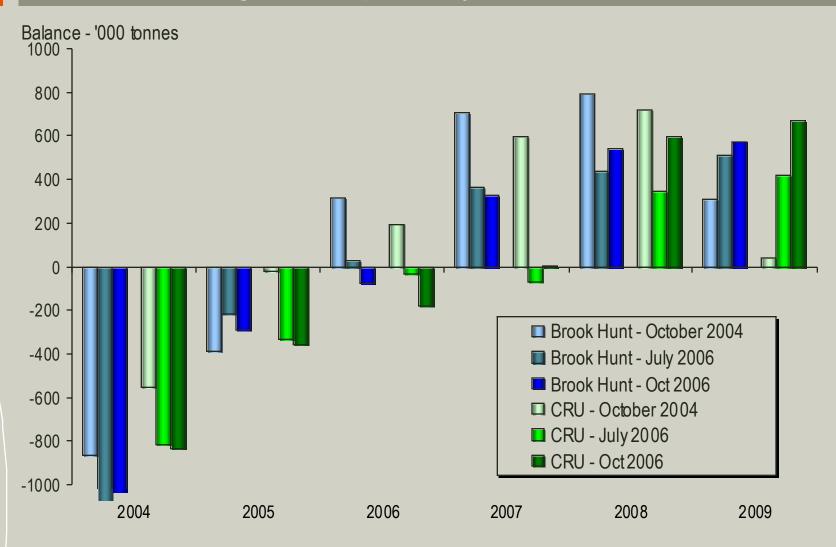


## Spence first cathode harvest





# Deficit now seen in 2006 and 2007 much closer to balance, but seen moving into surplus beyond that

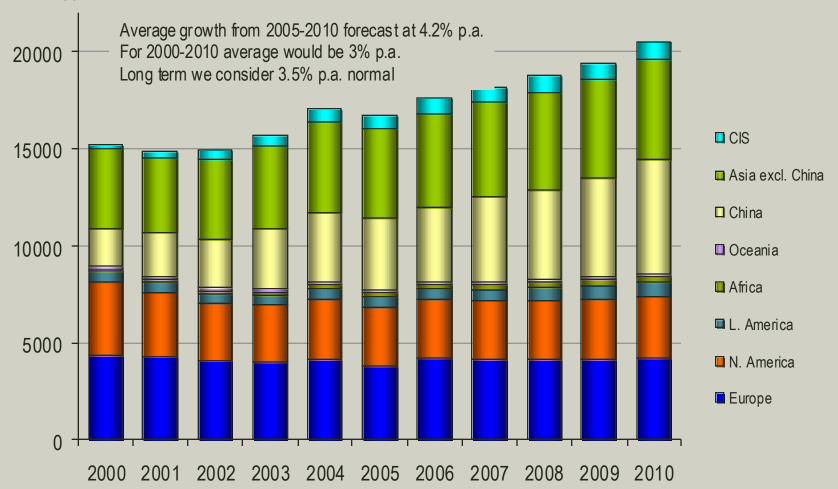


Data: CRU, BH



# China forecast to account for over half of World refined Cu demand growth from 2005-2010

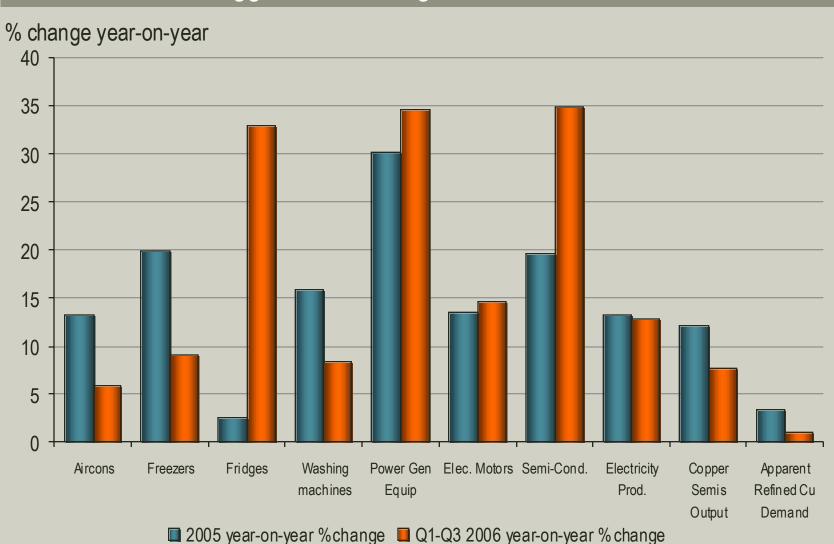
Refined copper - '000 tonnes



Data: BHP Billiton, ICSG



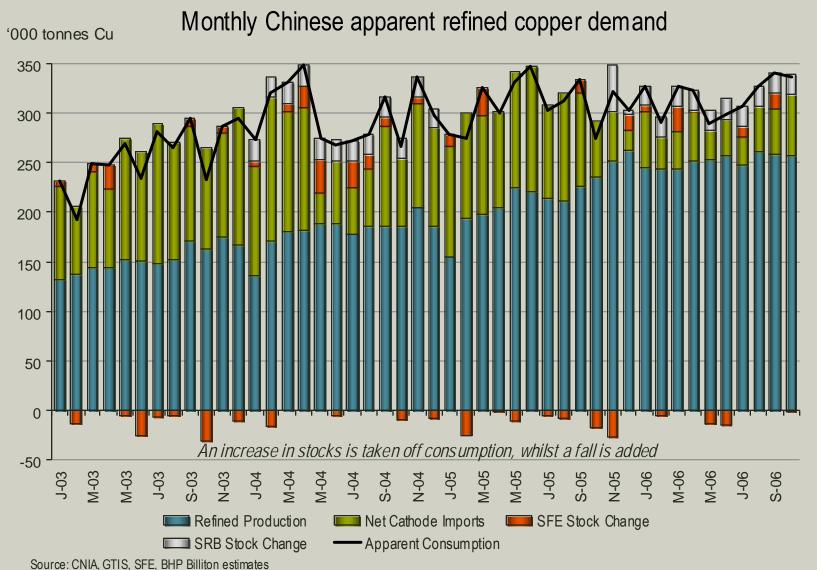
## Manufacture of copper containing goods has picked up. Growth of these and semis suggest destocking at cathode level.



Data: NBS, CNIA, BHP Billiton



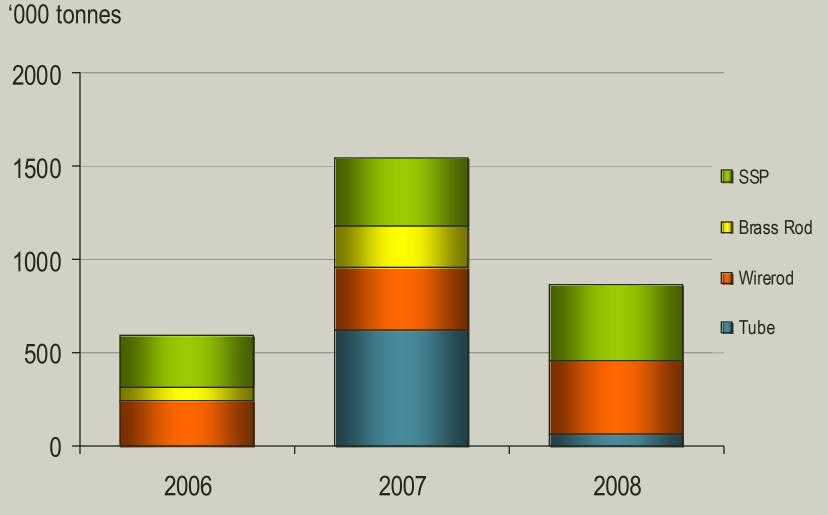
China's apparent consumption of refined copper now 3% higher year-on-year for Jan-Oct 06. Demand growth has re-accelerated since middle of 2006.



**bho**billiton

Note: Have assumed 250kt of destocking by SRB in 2004 spread evenly over twelve months and 20kt per month in 2006. Production numbers for 2006 are revised upwards as per revised totals for previous years.

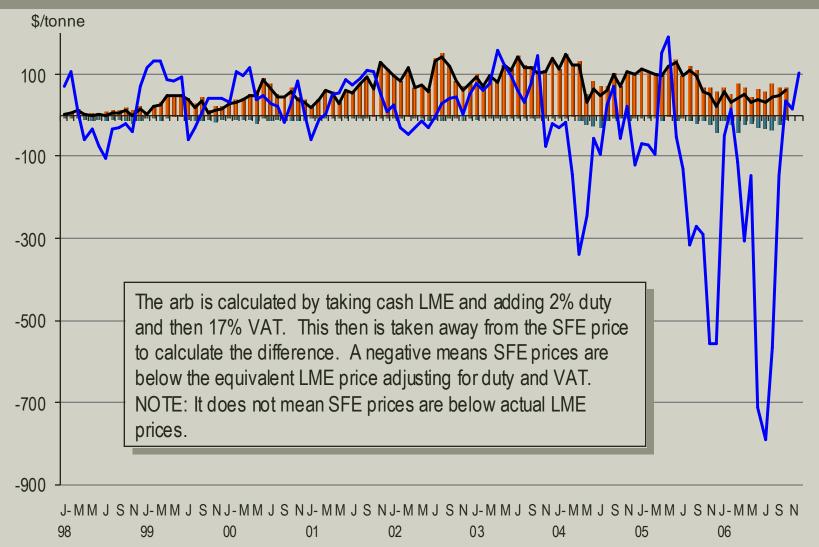
# Chinese semi-fabricators expected to bring on close to 3m tpy of capacity by end of 2008



Data: CRU

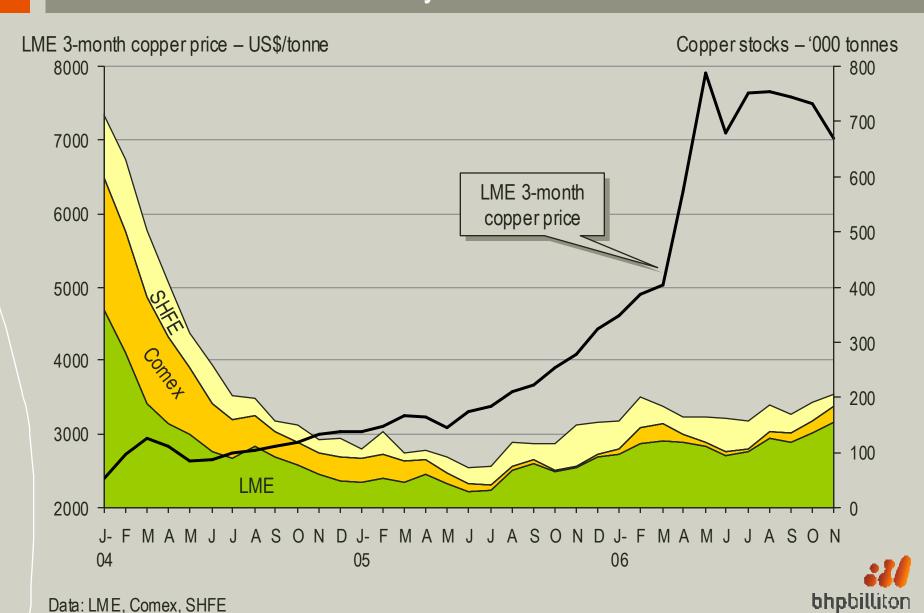


The arb – difference between SFE price and equivalent LME price - has recovered in past three months. Imports lag by about two to three months.

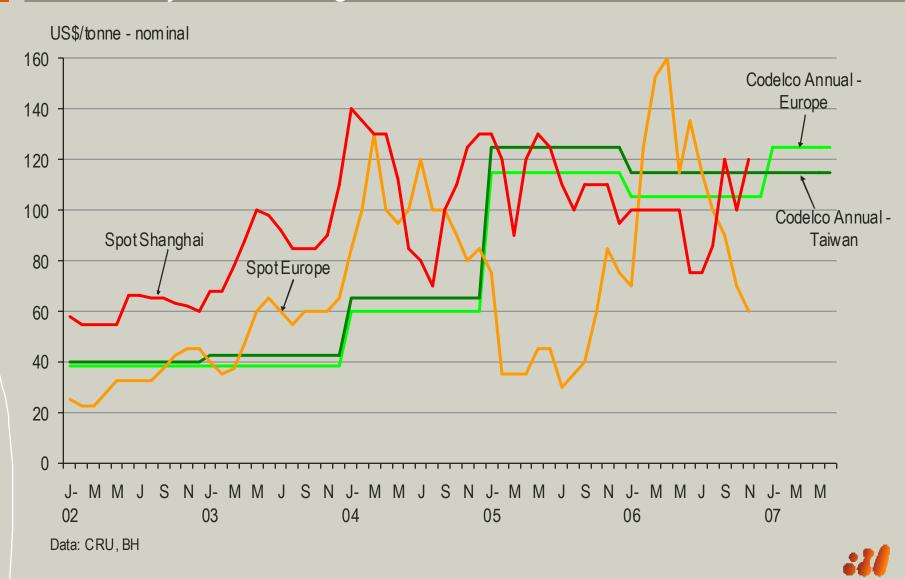




# Exchange stocks of reined copper have risen from lows in mid-2005 but still are at very low levels

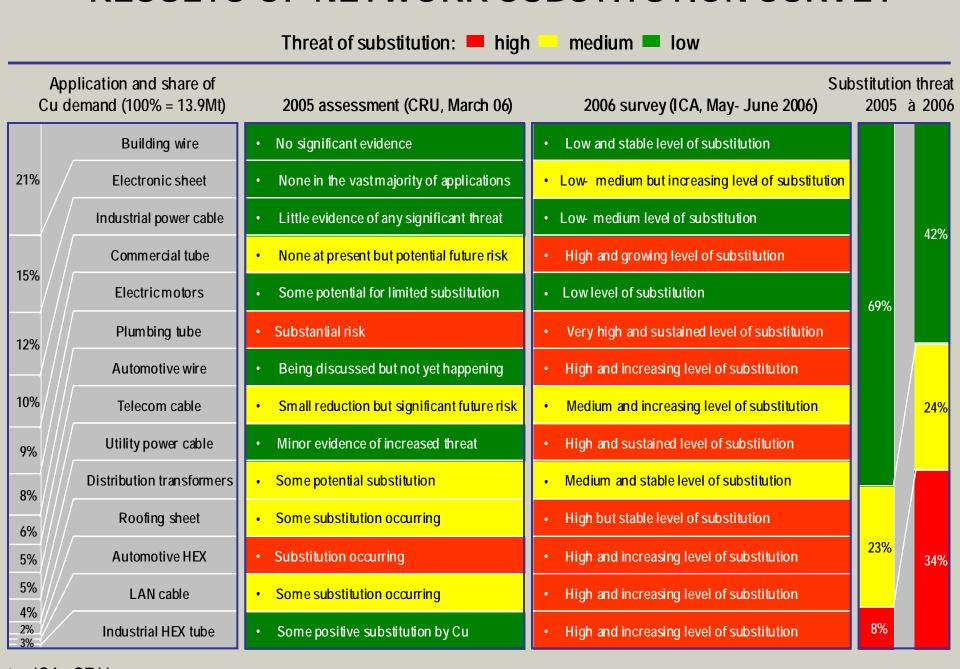


# Spot premia in Europe have weakened (seasonality?), but in China they have strengthened

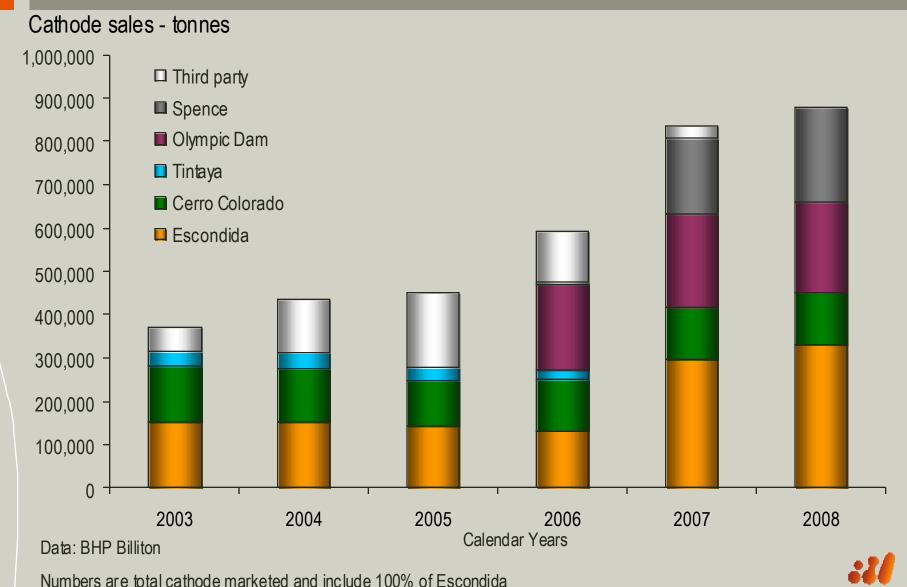


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## RESULTS OF NETWORK SUBSTITUTION SURVEY

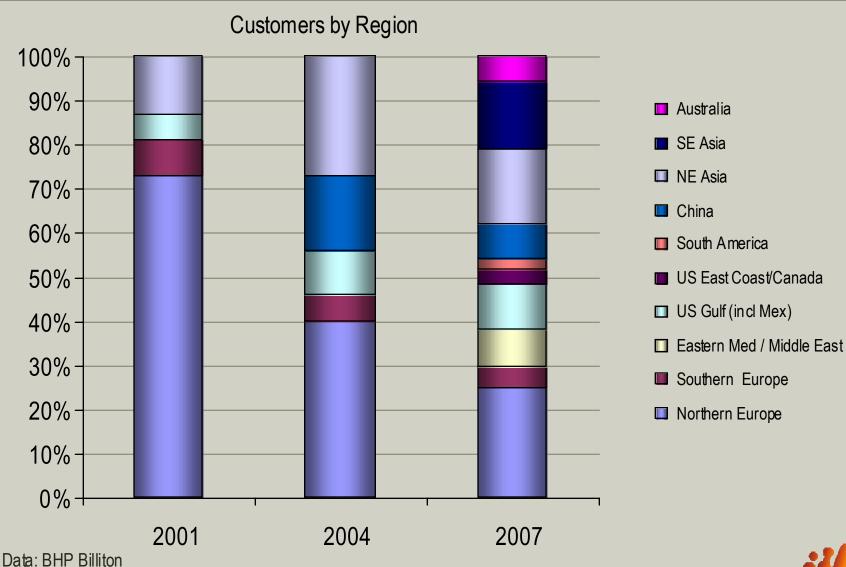


# With addition of OD, Escondida expansion and Spence, cathode book will double from CY 2005 to 2008



**bhpbilliton** 

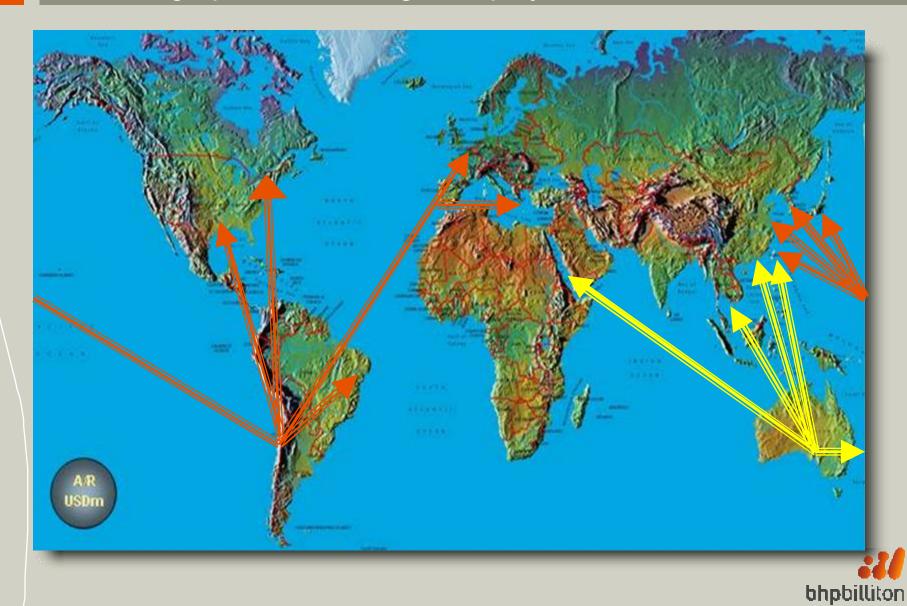
## Geographical split



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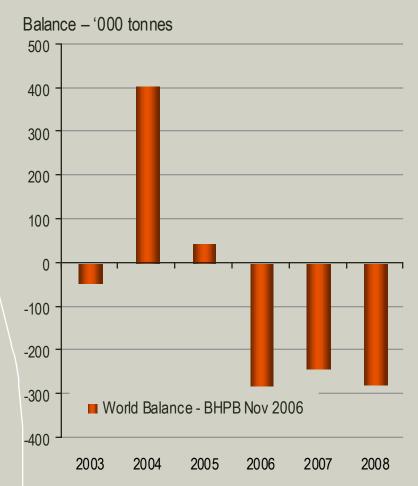
Numbers are total cathode marketed and include 100% of Escondida

## Our Geographical Coverage - Equity

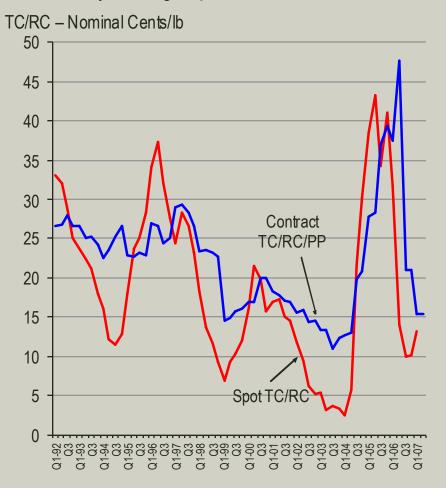


## Contract terms have historically been less volatile than spot terms and current contract reflect renewed tightness in the market

#### World Cu concentrate market balance



#### Quarterly average spot and contract TC/RCs



Note: Contract terms show annual and mid-year settlements. Mid-years in 2006 had capped PP and annuals so far settled for 2007 do not have PP. Data: BHP Billiton, CRU, BH



## Concentrate Update

- Structural smelting overcapacity due to recent significant expansions (China/India but others as well)
- Exacerbated by chronic mine underperformance
- 2004 and (to a lesser extent) 2005 were soft years for miners (TC/RC's) but the tables turned in 2006 and the next few years look very tight
- Commercial terms reflect this
  - CY06 \$95/dmt and 9.5 c/lb with uncapped PP
  - MY06/07 \$60/dmt and 6 c/lb with PP capped at 6 c/lb
  - CY07 to date \$60/dmt and 6 c/lb no PP
- At prevailing prices, the capping/elimination of PP represents significant value



## Copper Market Summary

- Market has moved back closer to balance but with stocks low is very vulnerable to supply disruptions
- Risk of disruptions remains higher than normal due to equipment, energy, water shortages
- More new projects in coming years are in riskier countries and resource nationalism threatens to, at least, raise costs
- High prices have encouraged search for substitutes but, as yet, this has not been the major influence on demand
- Current view is still very positive for refined demand
  - Growth in China, SE Asia, CIS, Middle East, India
  - World is becoming ever more electrified
- Scrap remains a significant source of supply but much of the increase to date has been destocking encouraged by high prices – not infinite

bhobilli

 US slowdown is a cause for concern but not as great as ten years ago as growth is now elsewhere and less dependant on US consumer

## **Uranium Marketing**

John Crofts Marketing Director Base Metals

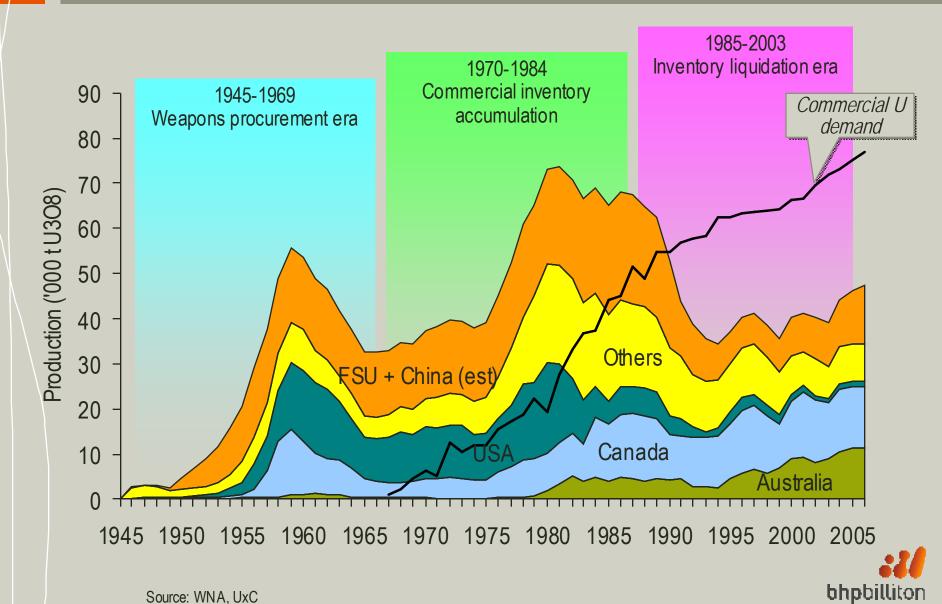
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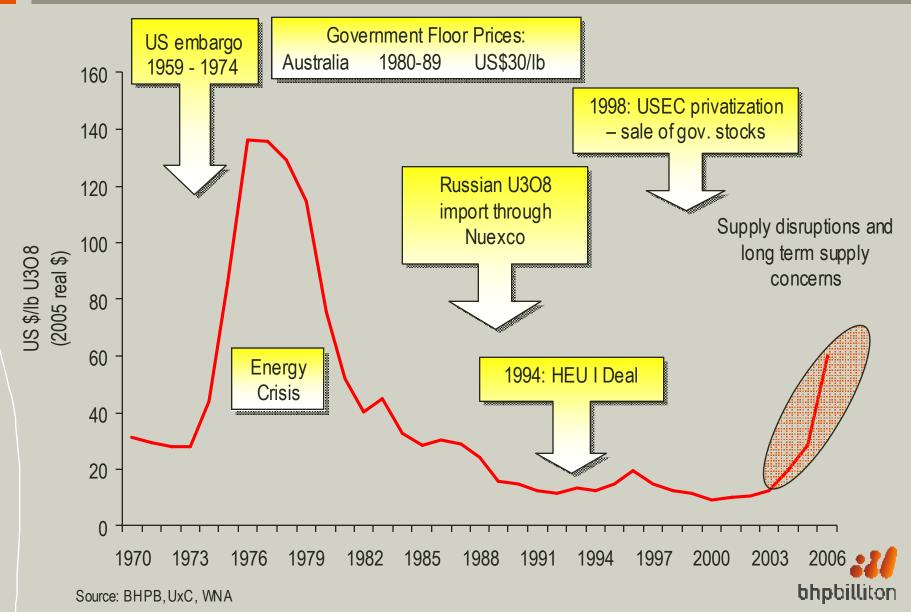


## Supply and demand: historical look

Source: WNA, UxC

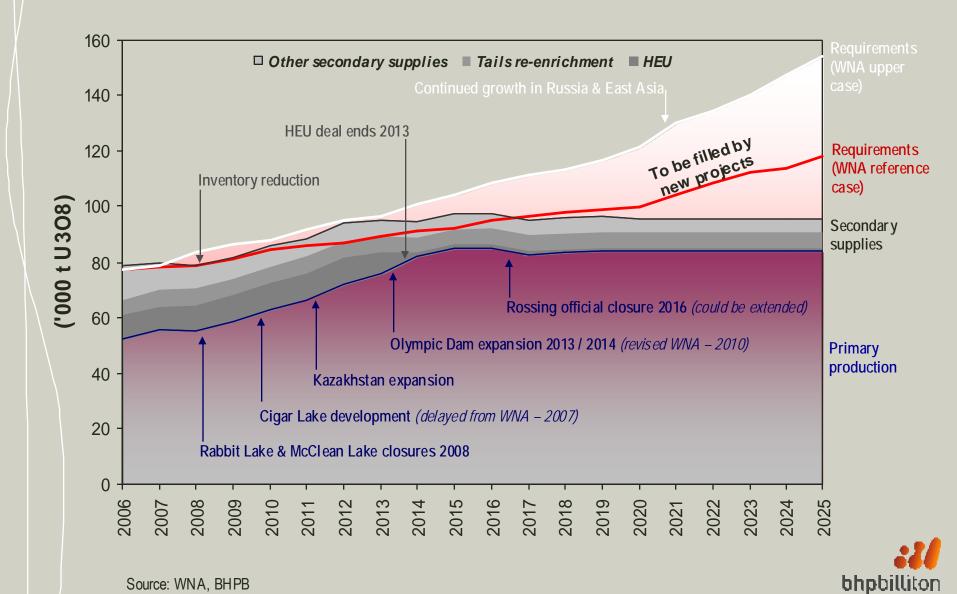


## Uranium spot price: historical look

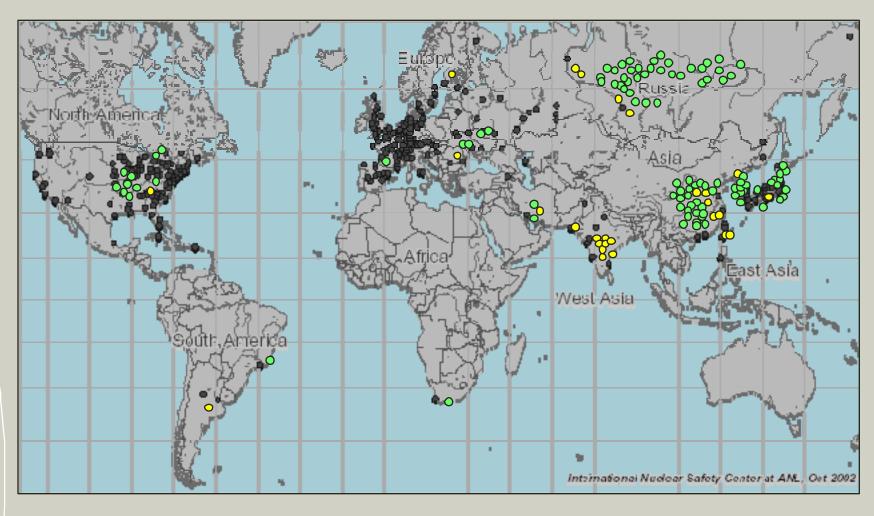


## Supply and demand: outlook

Source: WNA, BHPB



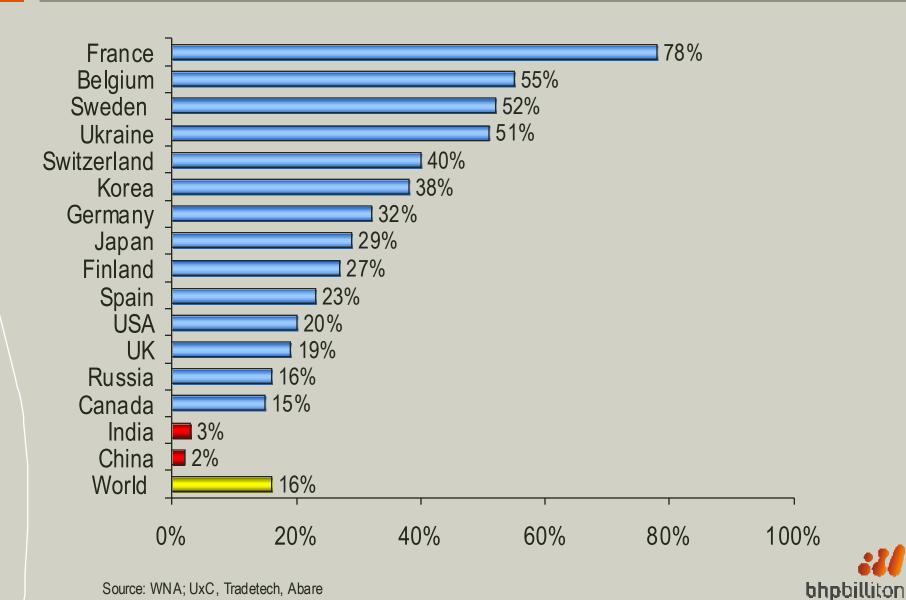
## Nuclear growth will be especially strong in Asia



Operational - 441 Operational - 441

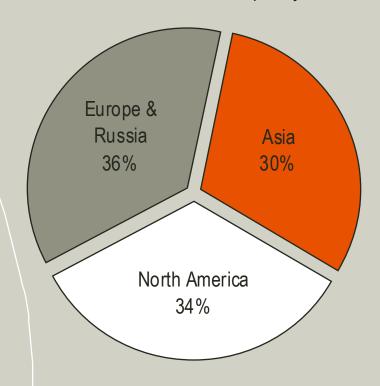


# Nuclear plays an important role in supplying electricity to many industrialised countries

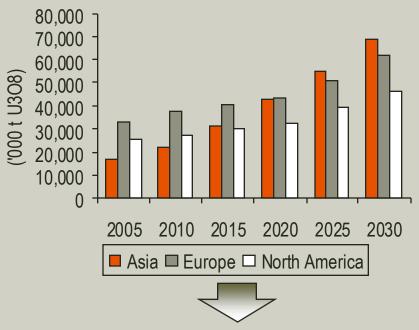


### BHP Billiton uranium customer base

### Current BHP Billiton sales split by volume



#### WNA Forecast to 2030: (Upper case)



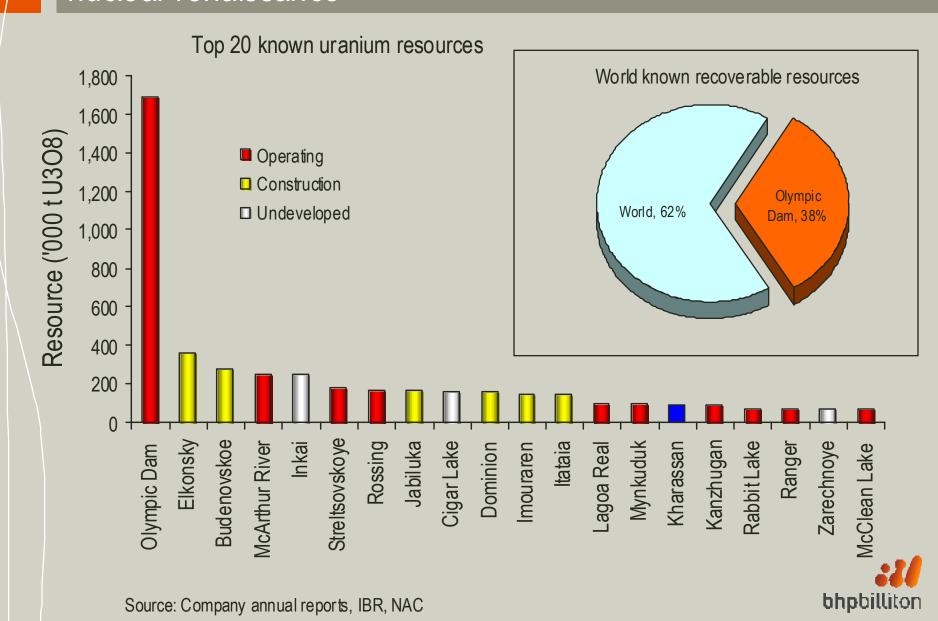
2005 - 2030

2000 2000			
Region	Growth %	Additional tpa U3O8	Share
Asia	309%	52,000	51%
Europe & Russia	88%	29,000	29%
N.America	82%	21,000	20%
3 Regions Total	135%	102,000	100%

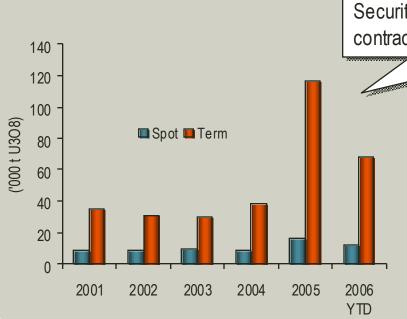


Source: BHPB, WNA

## Olympic Dam will play a significant role fuelling the nuclear renaissance



## Uranium contracting and industry trends



Security of supply concerns have increased contracting activity in spot and long term market

#### Spot market

 Consumers, producers and financial investors have been active in the spot market

Industry trends in term contracting:

- suppliers favouring market based pricing
- fixed priced component becoming less available
- market placing premium on near term product
- floor prices becoming standard in term contracts
- terms extending beyond 10 years (major producers)

Spot volume represents small portion of total volume transacted



## BHP Billiton uranium marketing

- BHP Billiton is currently in negotiations with customers for post OD expansion uranium sales contracts.
- BHP Billiton is negotiating contracts with the following terms and conditions:
  - Volumes are conditional upon the Olympic Dam project expansion
  - Floating price
  - Floor price



## Uranium market - summary

- Market remains tight in the near term:
  - Production delays have shifted some supply out farther
  - Demand is poised to grow with many countries embarking on massive nuclear expansion plans.
  - Many utilities are now buying uranium for their initial fuel cores putting additional strain on near term requirements
  - Security of supply concerns and new reactors build lead to increased inventory builds
- Term market is very active as utilities look to secure their forward uranium requirements
- Continued interest from hedge funds and investors
- Increased exploration activity worldwide especially in Australia, Canada and Kazakhstan
- Our current view of the uranium market remains positive



# Olympic Dam Expansion Project

Roger J Higgins
Vice President and Chief Operating Officer

14 December 2006





### Base Metals Australia

Base Metals Australia was established following the acquisition of Olympic Dam

- Regional Office located in Adelaide replacing activities in WMC Melbourne and Adelaide offices. Sharing the same building as BHP Billiton Shared Services and enjoying synergies
- Responsible for :
  - Olympic Dam Operations
  - Cannington
  - Olympic Dam Expansion

Integration of Olympic Dam into BHP Billiton has been completed

- New site management team
- Site fully integrated within BHP Billiton systems and networks



## Agenda

- Expansion Potential
- Pre-Feasibility work
- Major components
- Expansion Schedule
- Government approvals
- Community issues
- Conclusion



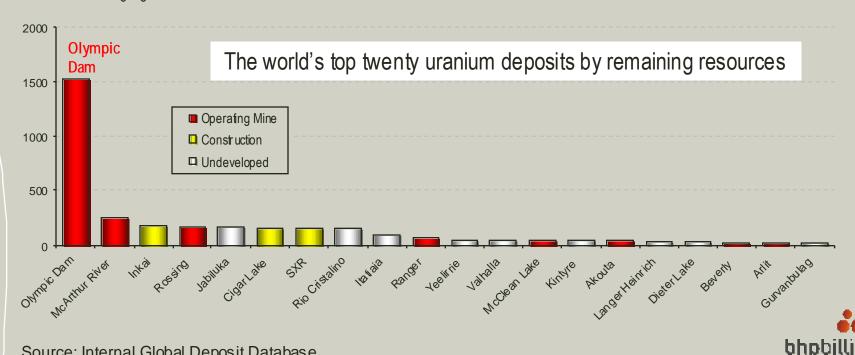




## Olympic Dam

- World-class copper-uranium-gold-silver mineral resource.
- 34% of world's uranium reserves.
- BHP Billiton ideally placed to meet increasing demand for uranium.
- Increased global demand and reducing secondary supplies provide excellent opportunity for Olympic Dam to fill supply gap

#### '000 tonnes of $U_3O_8$



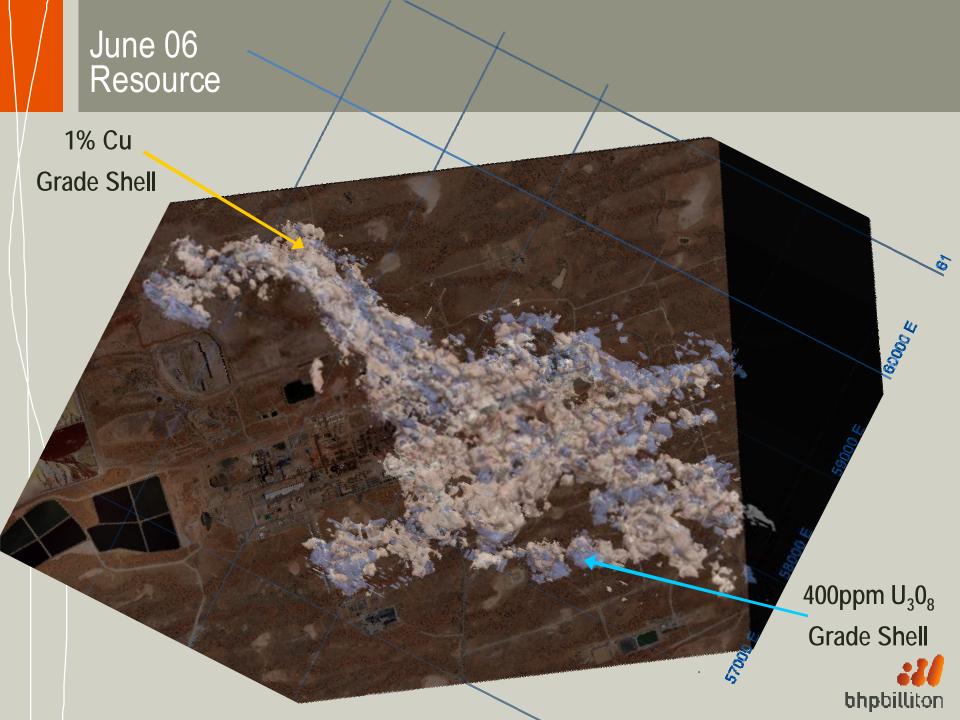
Source: Internal Global Deposit Database

## Olympic Dam Expansion Potential

- Mineral resource 4,430 million tonnes at 1.1% copper, 0.4 kilograms/tonne uranium and 0.5 grams/tonne gold
- Resource at time of acquisition 3,970 million tonnes at 1.1% copper, 0.4 kilograms/tonne uranium and 0.4 grams/tonne gold.
- Drilling program continuing 504,000 metres of RC/Diamond drilling on completion
- Resource is large enough to support a significant increase in annual production
- Pre-feasibility study for options up to 500,000 tpa copper (15,000 tpa uranium) requiring ~40 mtpa open-pit mining operation

The information that relates to Mineral Resources is based on information compiled by Stuart Hayward who is a member of the Australian Institute of Geoscientists





#### Olympic Dam Expansion – Pre-Feasibility Work

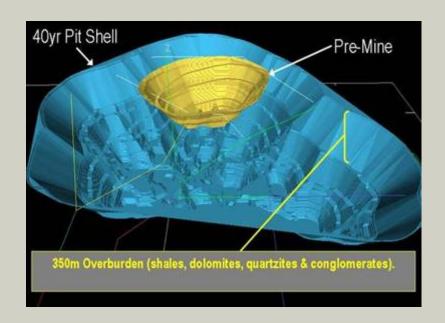
- High level front-end loading and risk assessment
- Ore resource delineation
- Mine planning open pit preferred option
- Ore processing options
- Major infrastructure (water, power, rail, township expansion) in a remote and arid area





#### Olympic Dam Expansion – Major Components – 2009 - 2013

- Open pit mine 350 million tonnes per year
- New ore processing plant 4 times capacity of existing
- New 90 km rail line, Olympic Dam to Pimba
- New electricity transmission line 270 km
- New airport with 737 jet and night flying capacity
- New coastal desalination plant and 320km pipeline
- New construction camp up to 5000 person capacity
- New accommodation and services doubling of Roxby Downs population





#### Olympic Dam – Expansion Schedule

- Pre-Feasibility tollgate Q2 2008
- Feasibility tollgate Q2 2009
- Execution Phase 2009 2013
- Operation of Expanded Facilities ramp up from end 2013 into 2015





#### Olympic Dam Expansion – Government Approvals

- Environmental Impact Statement published in 2007 to seek approvals from Federal and South Australian Governments extensive public consultation already underway
- Indenture Agreement with South Australian Government sets regulatory regime and provides legislative certainty to encourage long term investment – re-negotiation during 2007



#### Olympic Dam Expansion – Community Issues

- Aboriginal Native Title and Heritage issues
- Life of Mine land access agreement being negotiated
- Community benefits for Aboriginal communities including education, training, employment, health, aged care and community capacity building
- Product Stewardship engagement with other stakeholders to contribute to research and development in Australia and overseas





## Olympic Dam Expansion Summary

	Current	Proposed (est.)		
Mine Production	Ore 10m tonnes	Ore 40m tonnes		
(per year)	Copper 200,000 tonnes	Copper 500,000 tonnes		
	Uranium 4,500 tonnes	Uranium 15,000 tonnes		
	Gold 80,000 ounces	Gold 500,000 ounces		
	Silver 800,000 ounces	Silver 2,900,000 ounces		
Energy	120 MW from State grid	400 MW from State grid, on-site gas or combination		
Water	32 MI/day from Great Artesian	~100 MI/day from Great Artesian Basin and coastal desalination		
(per year)	Basin			
Transport In/Out	1 m tonnes by road (12,000	2.2 m tonnes - road/rail intermodal or direct rail (26,000 truck movements)		
(per year)	truck movements)			
Exports	Via Port Adelaide	Via Port Adelaide and/or Darwin		



#### Olympic Dam Expansion- Conclusion

- Successful execution will transform this world class orebody into a world class mining and mineral processing operation
- We may be conducting the largest Pre Feasibility plus Feasibility study undertaken in mining industry
- Required by scale and complexity of proposed expansion
- Plans need to be well developed and understood before seeking final BHP Billiton and government approvals – includes investment evaluation and customer commitment.





## Olympic Dam

Dean Dalla Valle Asset Leader Olympic Dam

14 December 2006





#### Location – Olympic Dam South Australia

Key statistics	Current	After Expansion
Permanent Jobs	3,000	4,000
Indirect Jobs (Industry multiplier 1:5)	15,000	20,000
Exports (% of total annual SA exports by value)	12%	15%
Gross State Product (pa)	US\$1.3b	~US\$3.3b
Royalties (3.5% of gross) (pa to SA Government)	US\$46 m	~US\$106m

#### Milestones

1975 Discovered by WMC Resources

1982 Indenture arrangement with State Govt.

1988 Production began - 45,000t pa Cu & 800t pa U

1992 Optimisation #1 - 66,000t pa Cu & 1500t pa U

1995 Optimisation #2 - 84,000t pa Cu & 1500t pa U

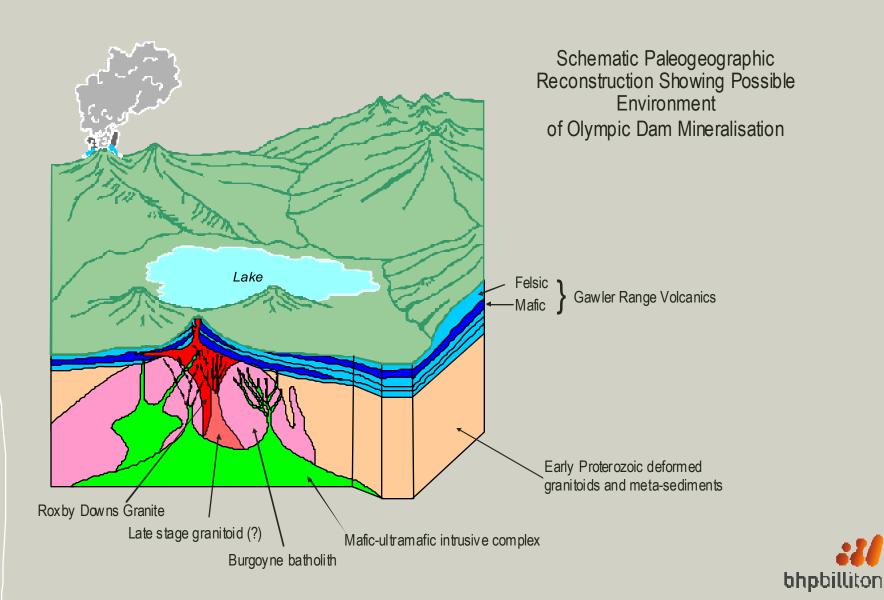
2005 BHP Billiton Acquisition

2006 Producing 200,000tpa Cu & 3,900tpa U

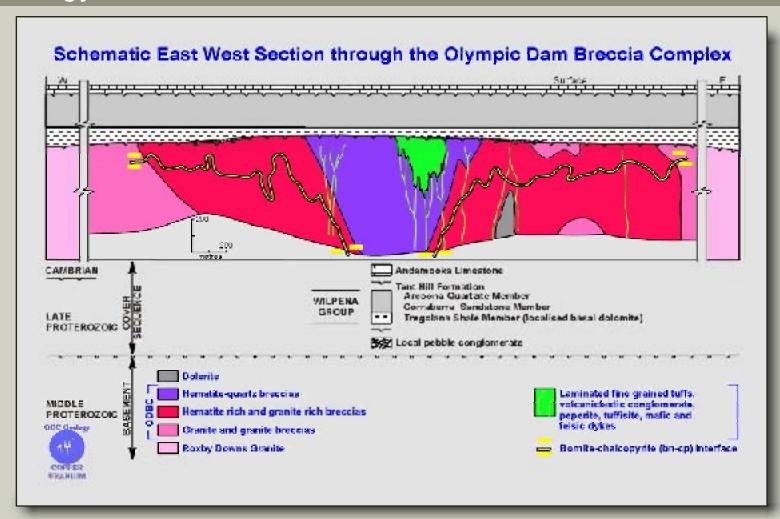




## Olympic Dam 1.6 billion years ago



## Geology

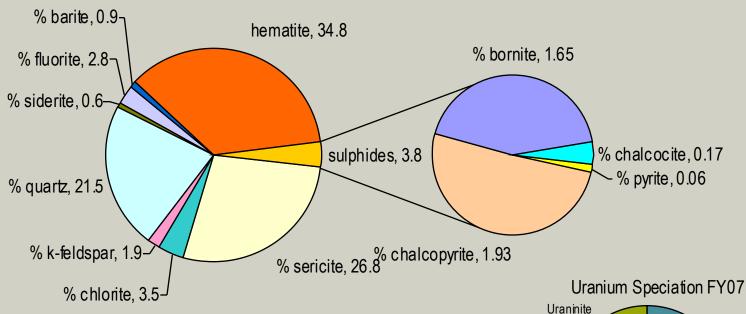


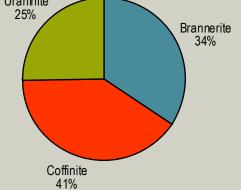
- 6th largest copper deposit
- Largest uranium deposit



# Overall calculated mineralogy of the ore mined from the underground stopes for FY07 YTD (1 Jul -28 Nov 06)

#### Mined stope ore mineralogy FY07 YTD (July-November)

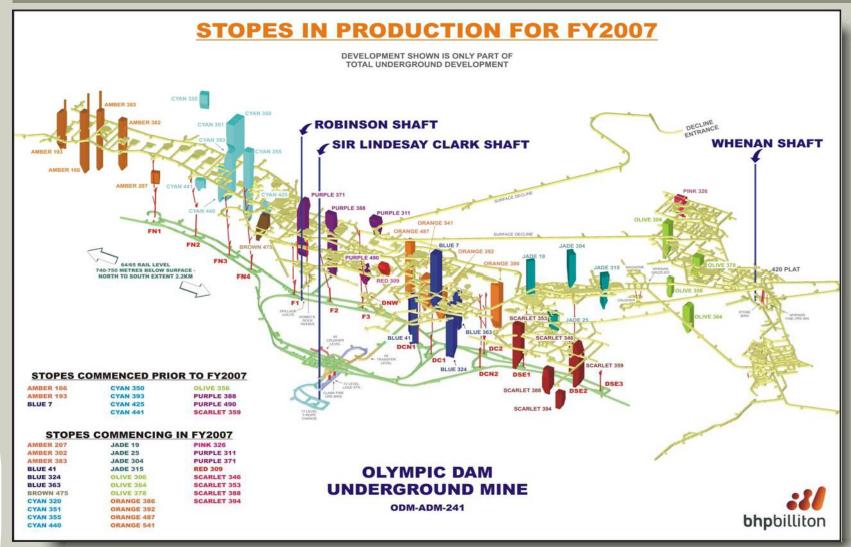




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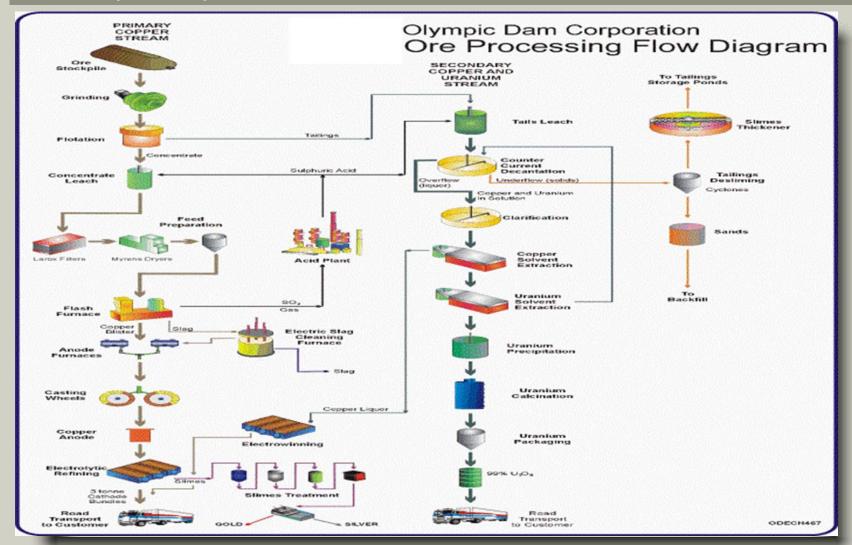
<sup>\*\*</sup> The sulphides are then broken down to show their relative proportions

#### Production





## A Complex Operation





#### Road to Zero Harm

Charter

**HSEC Policy** 

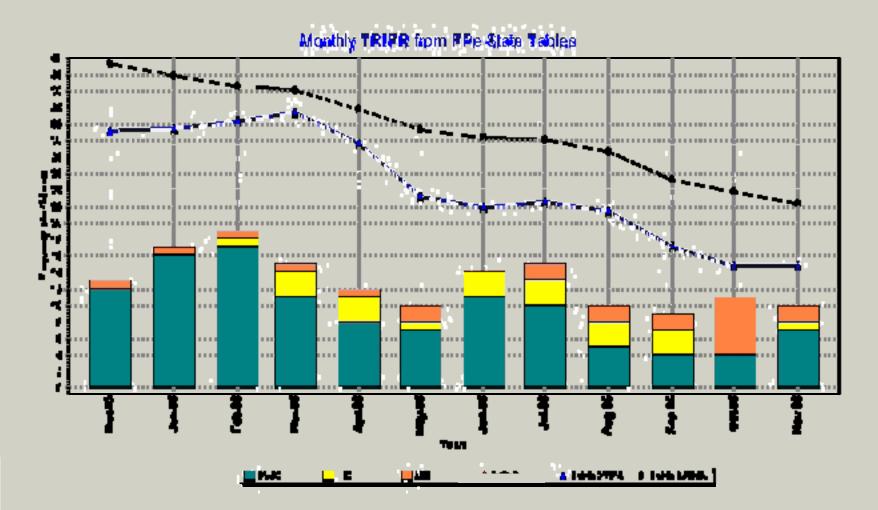
**Future State** 

**Principle** 



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## Total Recordable Injury Frequency Rate – Olympic Dam





#### The Journey to Zero Harm Continues - The Big Five

#### 2006 / 2007

- BHP Billiton Health Safety Environment Community (HSEC) Management Standards Implementation
  - Gap Analysis and Action Plans developed. S curve being developed
- BHP Billiton Fatal Risk Control Protocols (FRCP) Implementation
  - Gap Analysis and Action Plans developed. S curve being developed
- Zero Harm Leadership
  - One-on-one exercises with VPs
  - Roll out of new BHP Billiton Leadership Model
- Life Preserving Rules
  - Continue focus on intent (To save lives)
- On-the-job Behavioural Observations
  - Implementation of BST commenced



#### Olympic Dam – So What's New

- Safety Improvement
- Goal Alignment
- Mine development and production drilling at 10mtpa rate (MOS)
- Optimise Throughput
- Long Term Planning
- LoM Version 1
- Smelter Shut (Incl IR)
- Commenced demolition
- Management of USX
- Accommodation and Camps Upgrade
- Recruitment (All AWA model)
- Take advantage of BHP Billiton supply savings
- Margin Improvement Program
- Business Excellence
- Maintenance function established



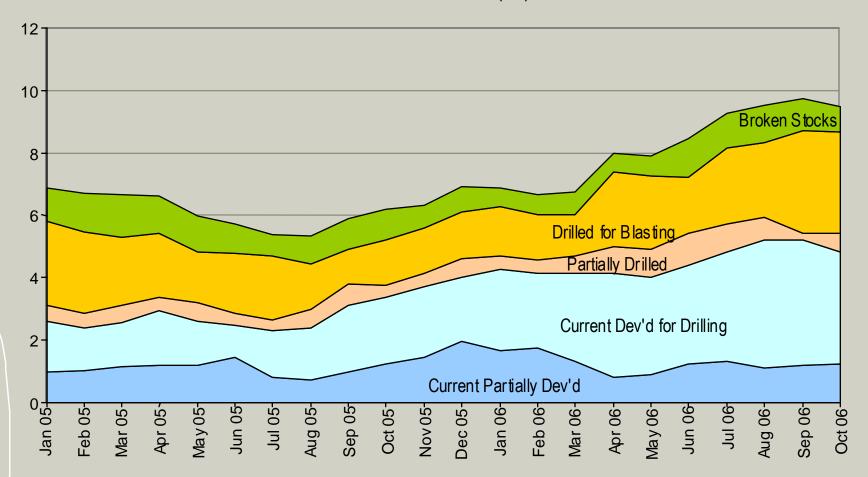
## Current Challenges

The Issue	The Answer	Status		
Mine bottleneck to be site output	<ul> <li>Underground Development</li> </ul>	• Complete		
Depleted underground accessible ore	Stope Production Drilling	Complete		
	Blasting	Underway / Improving		
• People	Build the right team to take     Olympic Dam forward	Well advanced		
Housing Shortage		Villages complete		
	Release land	• Land, 170 blocks ready		
	Construction Village & Homes	Housing commenced, ongoing to meet demand		
Reliability of Plant				
Concentrator / Hydrometallurgical Plant	Major maintenance	• Underway		
<ul><li>Leach Tanks/ CCD</li></ul>	Capital project for new tanks			
• Mine				
Underground Rail / Hoist	Major upgrade plan	Underway		
— Vent Fans	Establishment of cross site asset management			
Smelter - upgrade	Major shutdown successfully completed in September 06	Complete		



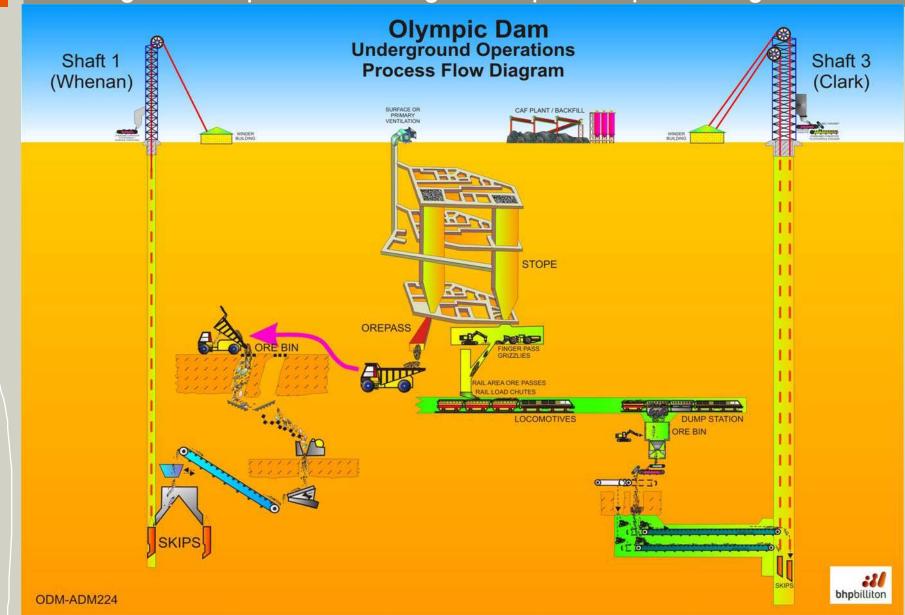
#### Mine underground stocks (Jan 05 – Oct 06)

#### Mine Stock levels (Mt)



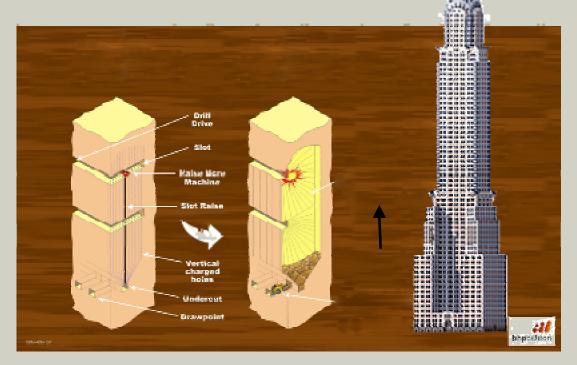


## Underground Operation, Long hole open stope mining



## How big is BIG?

Our largest stope is about 75% of the Chrysler Building size





260m to viewing platform

The tallest stope to be mined this year will be Cyan355: 242m



## Olympic Dam Performance

Paul Dunn Vice President Finance Olympic Dam

14 December 2006



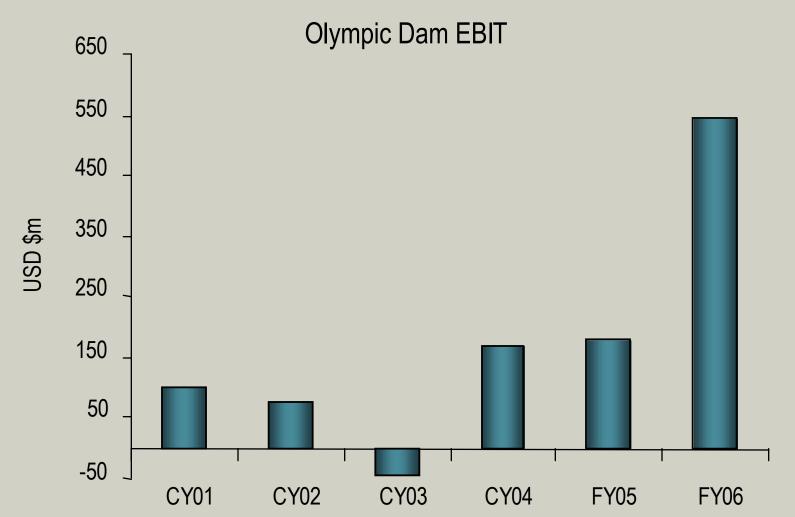


#### Whats Changed?

- Asset based accountability Asset accountable for results and self-sufficient in key services (EBIT Model)
- Alignment with other BHP Billiton Base Metals assets
  - marketing reflects portfolio approach
  - policies and procedures aligned
- Movement of service functions (Finance, IT, Business improvement, HR and Training, Supply, HSEC and Planning) from Central control to asset control and costing.
- Benefits of BHP Billiton Global Procurement and Global insurance captured.



## Olympic Dam - Historical EBIT





#### Financial Outcomes

Basis of Accounting different to WMC reporting results:

- Inventory Valuation
- Accounting Policies
- USD Reporting
- Overheads
- IFRS

(USUS\$M)	FY06		
Revenue	1,408		
EBITDA	741		
Depn & Amortisation	196		
EBIT	545		
C1 unit costs US\$/lb	0.90		
C3 unit costs	1.51		

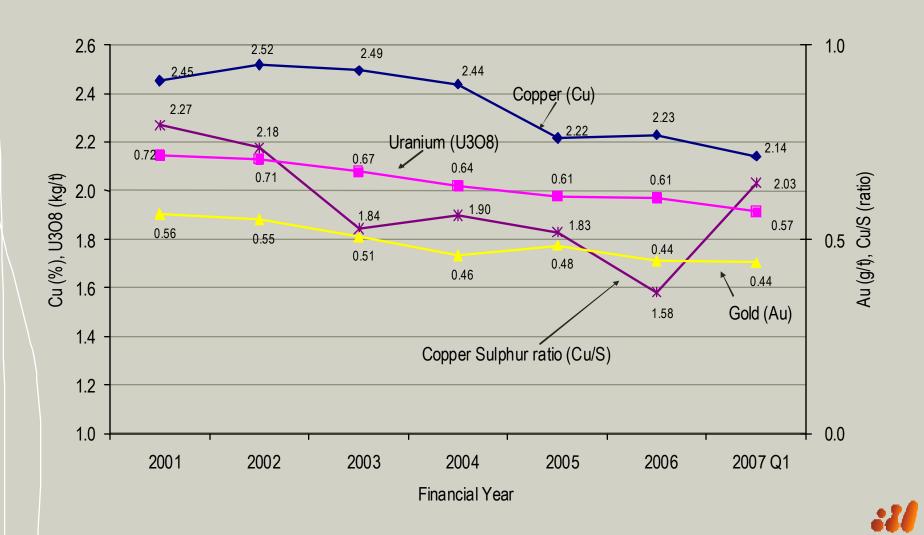
Sensitivity to ...

Exchange rate:
AUD/USD +/- 1c will
result in US\$8.9M
change in EBIT

Cu Price: +/- 1 Cent (US) will result in US\$4M change in EBIT

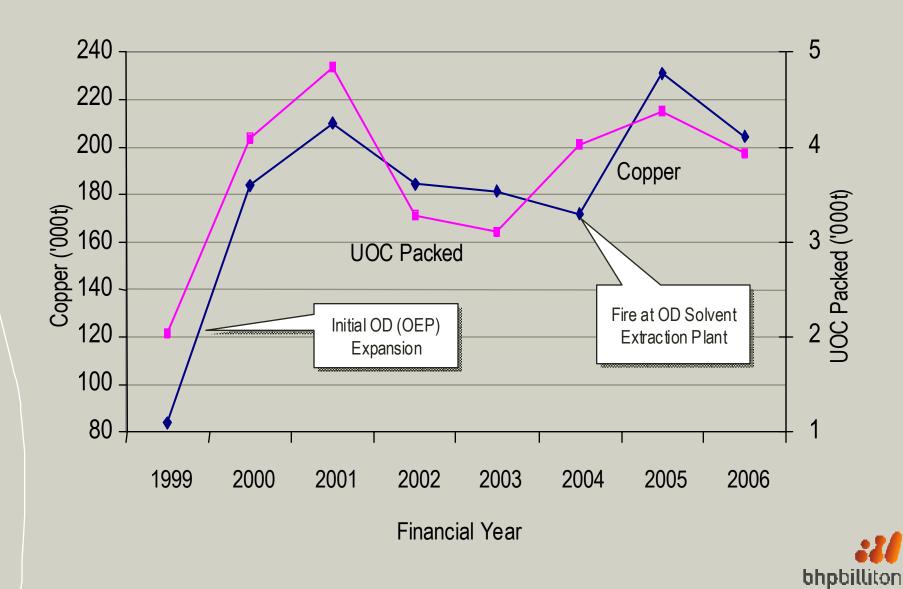


#### Olympic Dam Historical Head Grade



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#### **Historical Production**



#### 2006 Ore Resource & Reserve Declaration

	Olympic Dam – 2006 Ore resource and Reserve					
	Tonnes	Cu	U <sub>3</sub> O <sub>8</sub> kg/t	Au	Ag	Cu
	Million	%		g/t	g/t	Equiv %
Resources (inclusive of Ore reserves)						
Measured	680	1.5	0.5	0.5	3.1	2.5
Indicated	1,360	1.1	0.4	0.4	2.4	1.9
Inferred	2,390	0.9	0.3	0.5	1.9	1.6
Total	4,430	1.1	0.4	0.5	2.2	2.0
Reserves						
Proved	65	2	0.7	0.6	4.6	3.4
Probable	309	2.1	0.7	0.8	4.5	3.6
Total	374	2.1	0.7	0.8	4.5	3.6

Note: Above data, excluding Cu equivalents, extracted from the BHP Billiton – Mineral Resource and Ore Reserve Declaration as at 30 June 2006

Cu Equivalents have been calculated based on the following metal prices

Prices used: Cu=US\$0.94/lb; U3O8=US\$20.60/lb; Au=US\$435/oz; Ag=US\$5.40/oz;

#### Based on information compiled by:

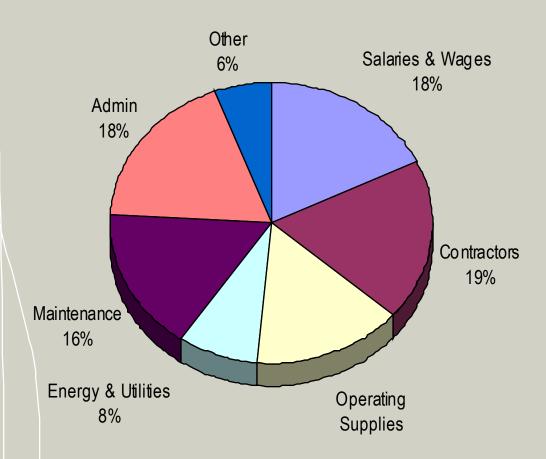
CP Resource Declaration – Stuart Hayward, MAIG

CP Reserve Declaration - David Vink, MAusIMM

who are BHP Billiton employees and consent to its inclusion in this presentation.



#### Cost Structure – FY06



Total Cash Costs US\$713Mill

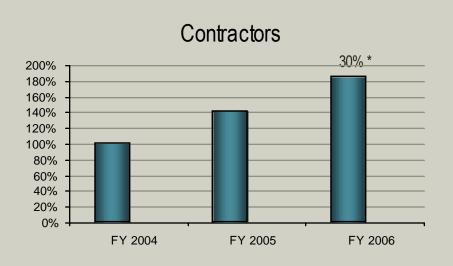
Fixed Variable Split (excl: TPPs) 60:40

#### Key Value Drivers

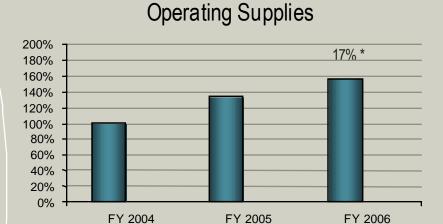
- Volume
- Recoveries
- Cost Reduction
- Business Excellence Projects



## Input Cost Pressures











# Cost Reduction & Revenue Increase offsetting current cost pressures

- Short Term Margin Improvement Program Jul/06 to Jun/07
  - Prioritisation and Implementation with rigorous discipline
    - Value driver trees analysis
    - Results and Actions Review Meetings with Managers and VPs
  - Benefits Capturing currently US\$21M delivered YTD in FY07
- Longer Term Start Jan/07
  - Train VPs, Managers, full-time and part-time Improvement Teams Six Sigma Methodology
  - Improvement pipeline management currently over US\$72M estimated benefits
  - Keep focus on cost reduction (50%) and revenue increase (50%)



#### Business Improvements – Project examples

- Revenue Increasing
  - Uranium Extraction Improvement
  - Revert Slag Smelting
  - Once off redundant equipment/material sales

#### Cost Reduction

- Reduction of light vehicle hire (US\$456k/annum)
- Reduced maintenance cost through centralised planning & scheduling (US\$760k/annum)
- Reduction of scrap remelting cost (US\$760k/annum)
- Reduction in equipment hire (US\$273k/annum)
- Improved contractor management. (US\$760k/annum)
- Improved equipment hire management. (US\$380k/annum)
- Reduced recruitment cost. (US\$304k/annum)



## 2007 Major Capital Projects

- Smelter major maintenance works
- Housing release of land, additional camp rooms
- Tanks refurbishment
- Raisebores Support of 5 year mine plan
- MP & D

