



# BHP Billiton Iron Ore

Leveraging our strengths to  
deliver value

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# Disclaimer

## Mineral Resources and Ore Reserves

This presentation includes information on Mineral Resources (inclusive of Ore Reserves) and Ore Reserves.

These have been compiled by: P Whitehouse (MAusIMM) – Western Australia Iron Ore (WAIO) who is employed by BHP Billiton at the time of reporting. This is based on information in the BHP Billiton Annual Reports from 2007 to 2012 and other investor presentations which can be found at [www.bhpbilliton.com](http://www.bhpbilliton.com). All information is reported under the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves, 2004' (the JORC Code).

The Compiler verifies that this report is based on and fairly reflects the Mineral Resources and Ore Reserve information in the supporting documentation and agrees with the form and context of information presented.

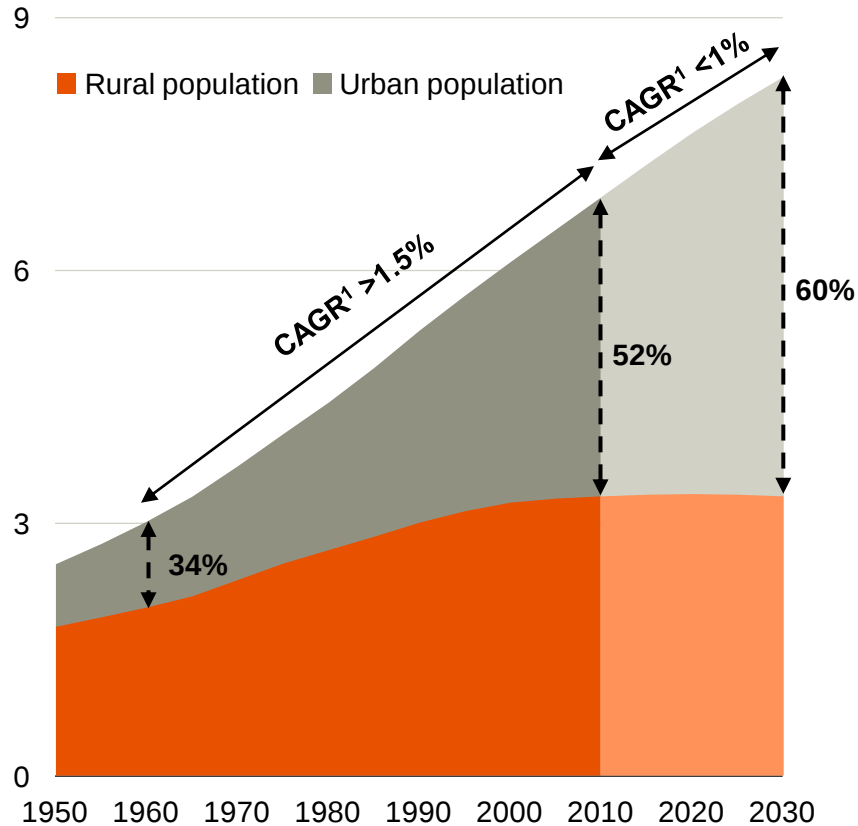
Ore Reserve and Mineral Resource classifications are contained in Table 1.

**Table 1**

|        | Proved Reserve<br>(Bt) | Probable Reserve<br>(Bt) | Measured Resource<br>(Bt) | Indicated Resource<br>(Bt) | Inferred Resource<br>(Bt) |
|--------|------------------------|--------------------------|---------------------------|----------------------------|---------------------------|
| FY2012 | 1.4                    | 2.0                      | 2.3                       | 3.7                        | 14.6                      |
| FY2011 | 1.4                    | 2.1                      | 2.2                       | 3.9                        | 13.2                      |
| FY2010 | 1.3                    | 2.0                      | 1.9                       | 3.5                        | 10.7                      |
| FY2009 | 1.3                    | 1.8                      | 1.8                       | 3.2                        | 7.5                       |
| FY2008 | 1.5                    | 1.5                      | 2.0                       | 2.9                        | 6.8                       |
| FY2007 | 1.3                    | 1.1                      | 1.7                       | 2.1                        | 4.2                       |

# Long term drivers of demand remain intact

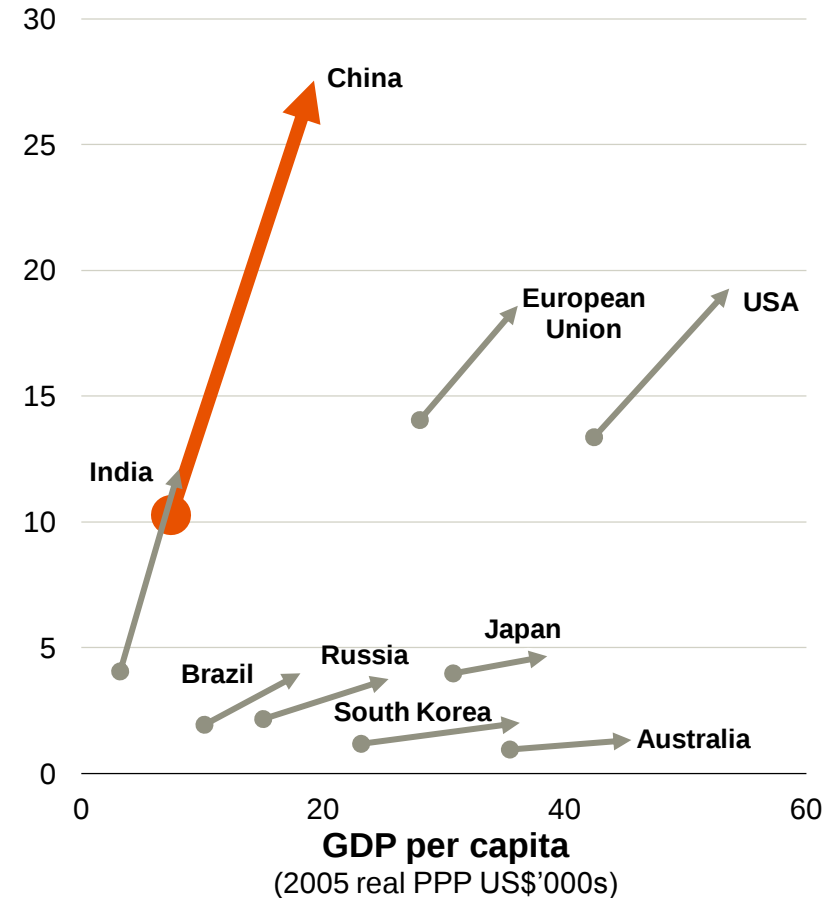
**Global population growth (historical and forecast)**  
(billion people)



1. Total global population CAGR.

Source: United Nations (Population Division, Department of Economic and Social Affairs).

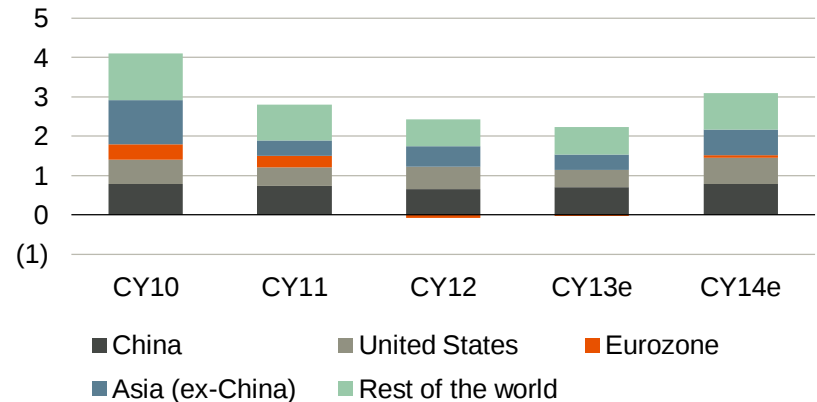
**GDP change between 2011 and 2025**  
(2005 real PPP US\$ trillion)



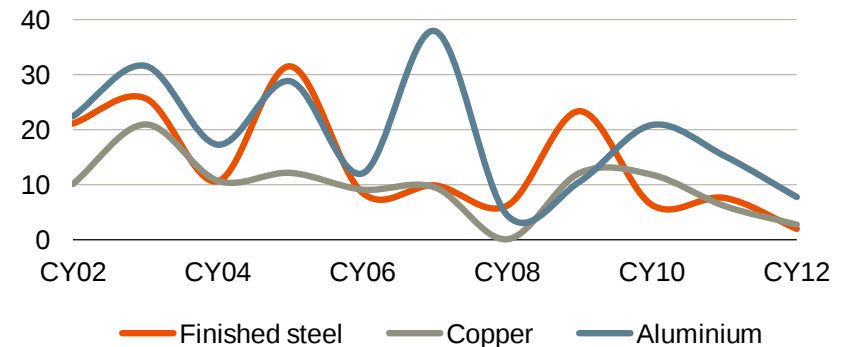
# Global growth is strengthening, Chinese commodities demand is moderating

- The global economy looks set to benefit from a period of improving economic growth
- China will remain the primary driver of commodities demand and its cyclical recovery is in place
- Rebalancing of the Chinese economy suggests resource intensity will consolidate at a fraction of its GDP growth rate (rather than a multiple)
- Demand growth rates for many of our core products within China are expected to remain in the range of 2% to 4% per annum

**Contribution to global GDP growth**  
(% YoY)



**Chinese commodity consumption growth rates**  
(% YoY)

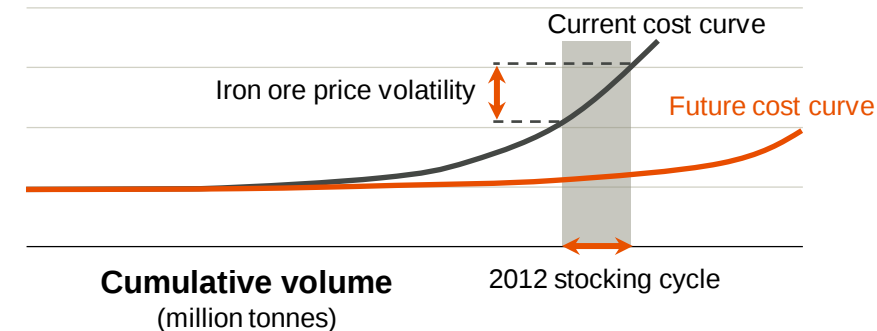


Note: Real growth rates weighted for share of world GDP; 2005 US\$ (market exchange rates).  
Source: Global Insight.

# Iron ore prices will remain volatile in the short term

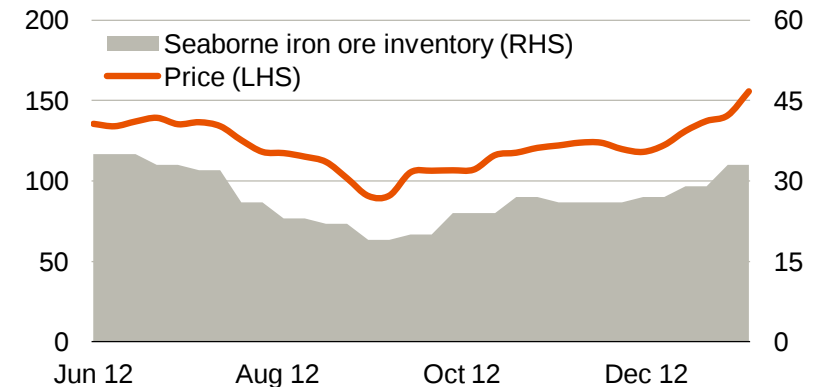
- Over the last decade, Chinese demand for seaborne iron ore overwhelmed the capacity of the low cost supply basins
- Prices responded to induce high cost supply, which led to a steepening of the cost curve
- With the addition of low cost supply, customer inventory cycles now significantly impact the market price
- Substantially more low cost supply is either planned or in construction
- This will ultimately lead to a flattening of the cost curve and prices will mean revert

**Schematic iron ore cost curve**  
(US\$/t, CIF China)



**Iron ore spot prices**  
(US\$/t, 62% Fe, CIF China)

**Steel mill inventory**  
(days of inventory)



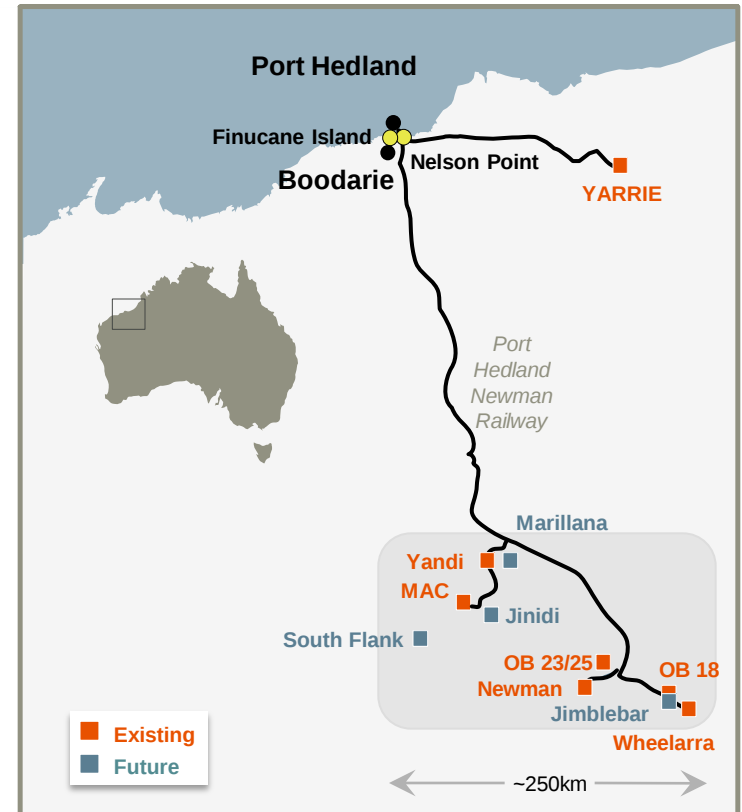
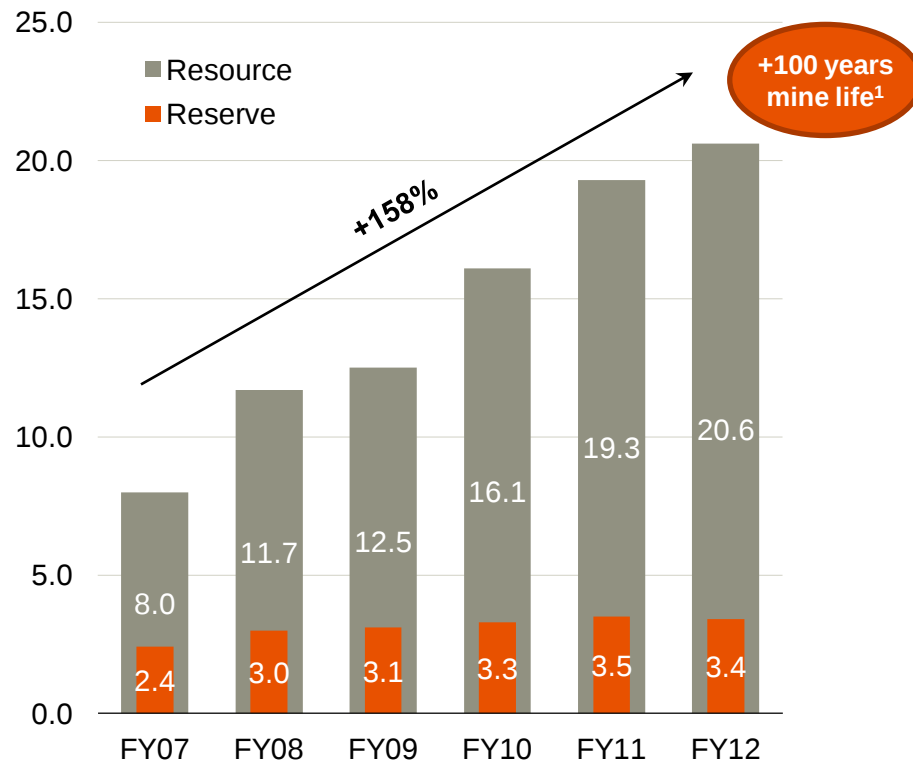
Source: BHP Billiton analysis; Platts; Mysteel survey of 55 small steel mills.

# Our world class resource base is a competitive advantage

## Pilbara mineral resources more than doubled in six years... within a concentrated footprint

### WAIO resources and reserves

(billion wet tonnes, 100% basis)



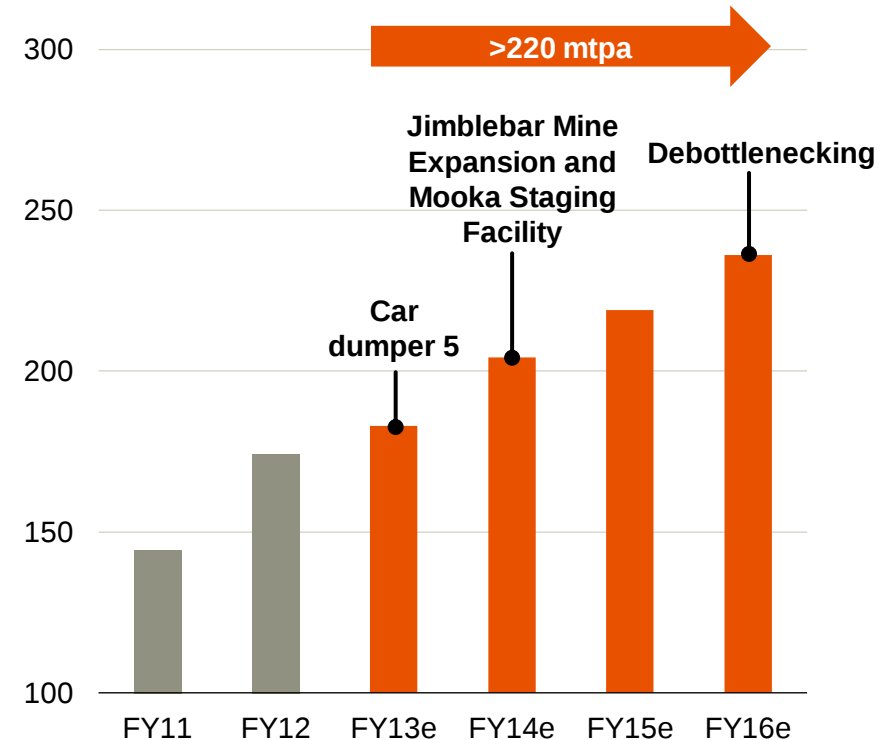
Note: Refer to disclaimer on slide 3.

1. Represents the Mineral Resource (inclusive of Ore Reserves) divided by the FY12 production rate and does not imply that any mine planning has been completed. The life of individual mines may be more or less than the number stated above.

# Major projects in execution are progressing well

- Major growth projects are on schedule and within budget
  - **Port Hedland Inner Harbour Expansion** achieved first production in Q4 CY12
  - **Jimblebar Mine Expansion** delivers 35 mtpa of mining capacity with larger processing capacity, first production scheduled for Q1 CY14
  - **Rail Yard Facilities Expansion** creates flexibility and increases our direct load capability with commissioning expected in H2 CY14
- Inner Harbour optimisation studies progressing well

**WAIO production**  
(mtpa, 100% basis)



# Jimblebar Mine Expansion on schedule

Jimblebar: Ore Handling Plant (February 2013)



# Capital efficient growth across the value chain



## Mines

- 35 mtpa Jimblebar Mine Expansion will take total mine capacity to 220 mtpa by Q1 CY14
- Jimblebar readily expandable from 35 to 55 mtpa
- Mobile crushers can unlock a further 20 mtpa across our portfolio of mines
- Only one new mining hub required for >300 mtpa

## Rail

- Achieved 145 mtpa with single track infrastructure although the large number of passing loops created inefficiency
- Dual track in place since May 2011 can deliver >300 mtpa of capacity with modest investment

## Car dumpers

- 5 car dumpers installed with optimised throughput potential of 55 to 60 mtpa per dumper
- 8 shiploaders installed with optimised throughput potential of 35 to 40 mtpa per shiploader
- Low cost opportunity to debottleneck the conveyor, stockyard and stacker-reclaimer system

## Stockpiles

## Ship-loaders

# We can significantly increase capacity by debottlenecking the port

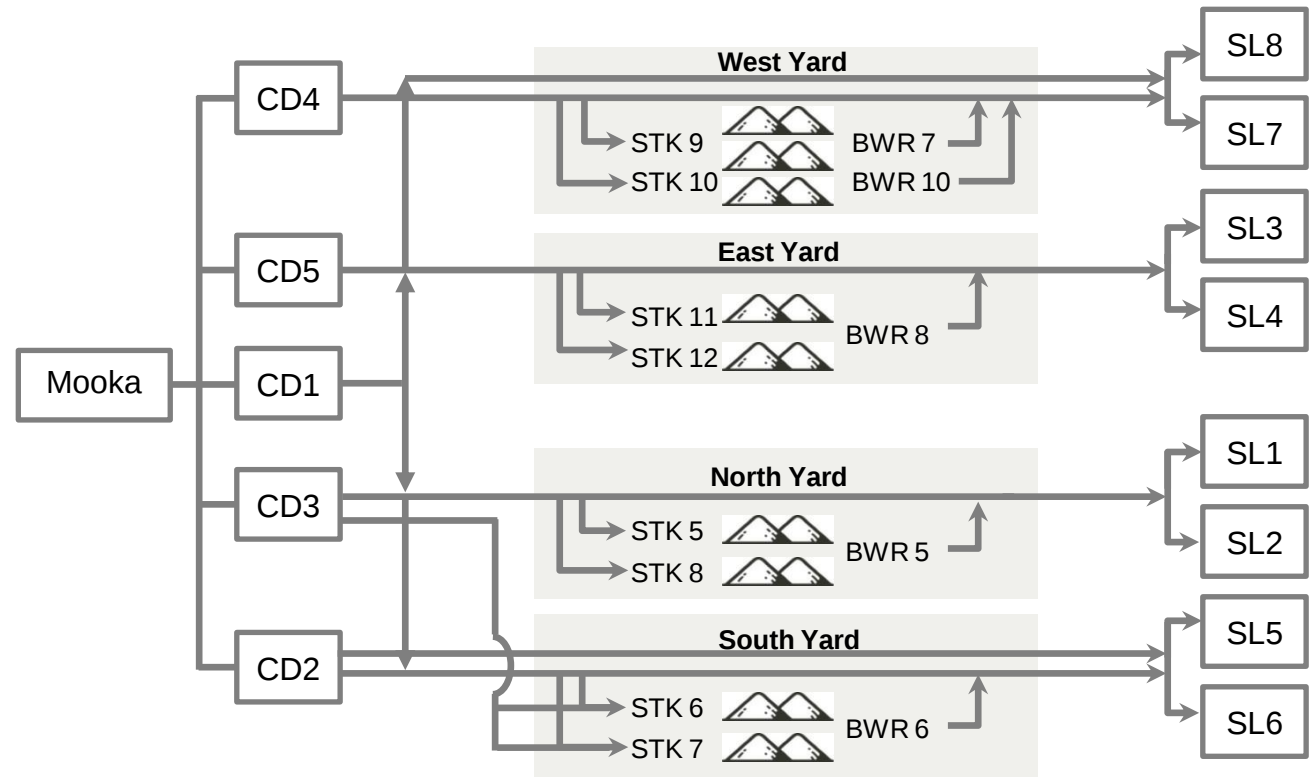
Optimise dumper performance and choke feed them



Ensure all low cost, incremental investment in shiploader capacity has been fully explored



Test dynamic scheduling opportunities and product strategies to improve system performance



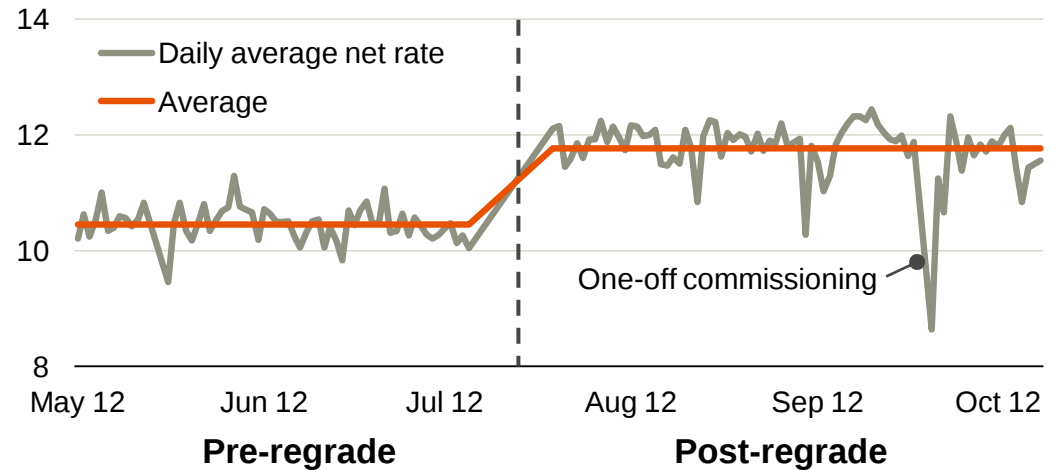
Mooka marshalling yard; CD: Car dumper; STK: Stockyard; BWR: Bucket wheel reclaimer; SL: Shiploader.

# Debottlenecking examples: car dumper and conveyor belt optimisation

## Actions

1. Regrade track leading to the car dumper
2. Increase speed of train input into car dumper (increase pusher arm torque, apron feeder speed control)
3. Optimise dump cycle logic (for example, tuning tip angle, bin level detection)

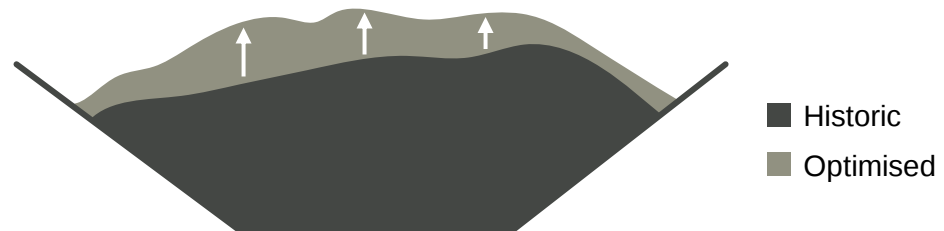
## Car dumper performance (ktph)



## Actions

1. Conveyor system optimisation allowed increased belt loading
2. Throughput rate increased from 10.5 ktph to 11.5 ktph

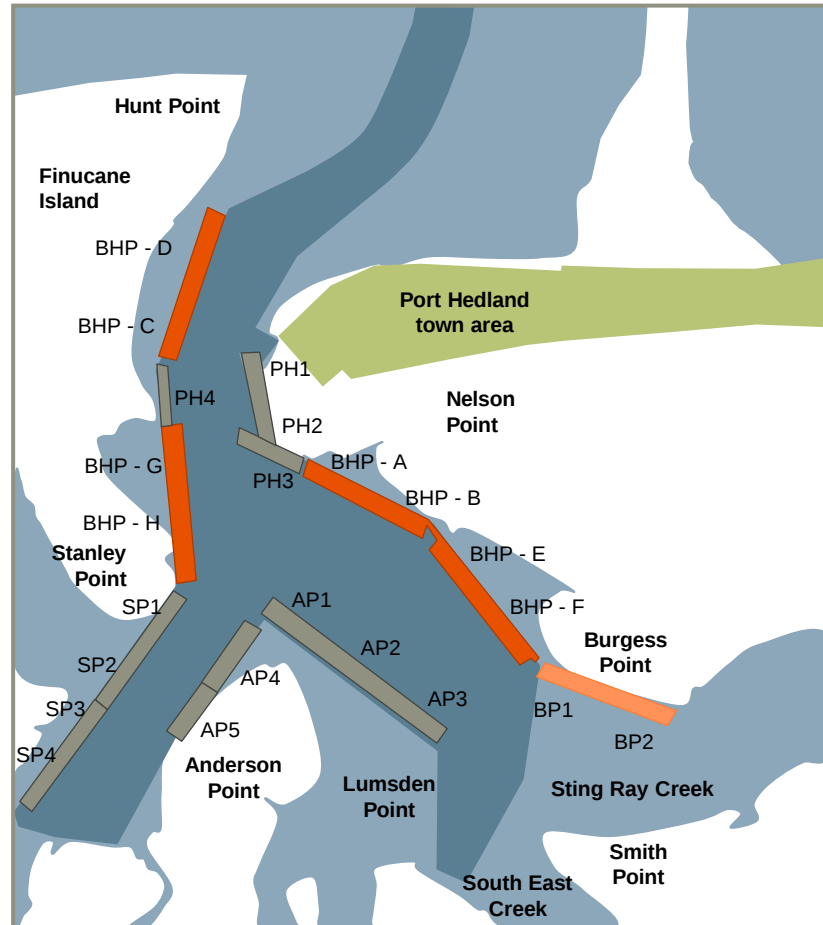
## Conveyor belt load profile



Schematic only.

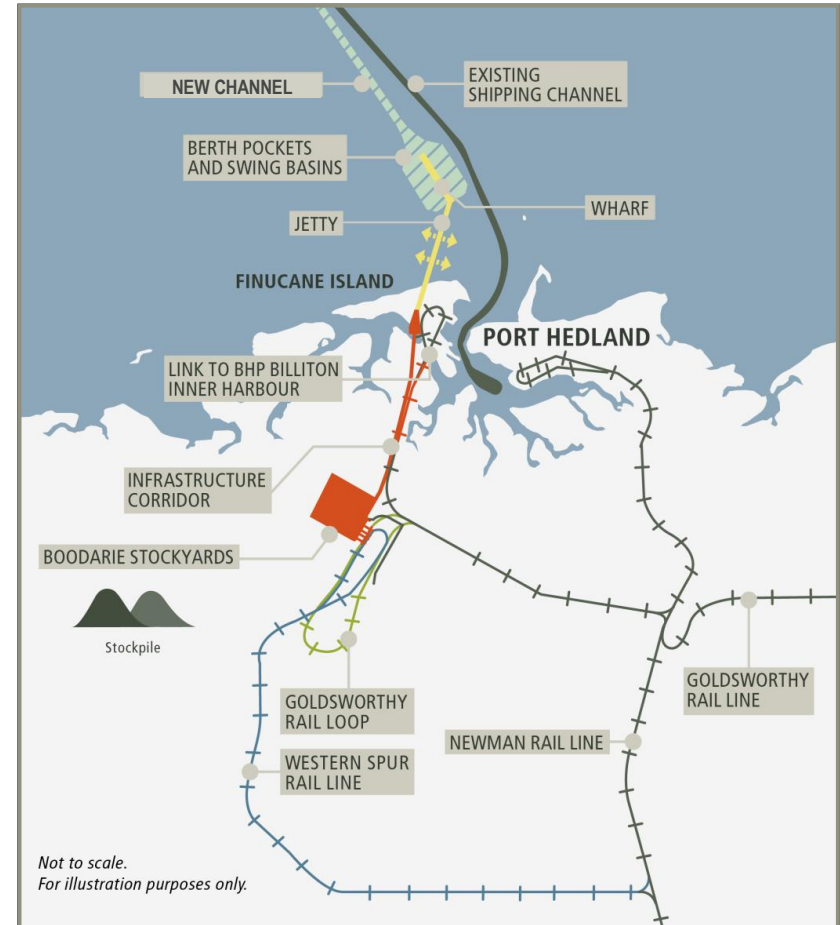
# Preserving the valuable dual harbour option

## Port Hedland Inner Harbour



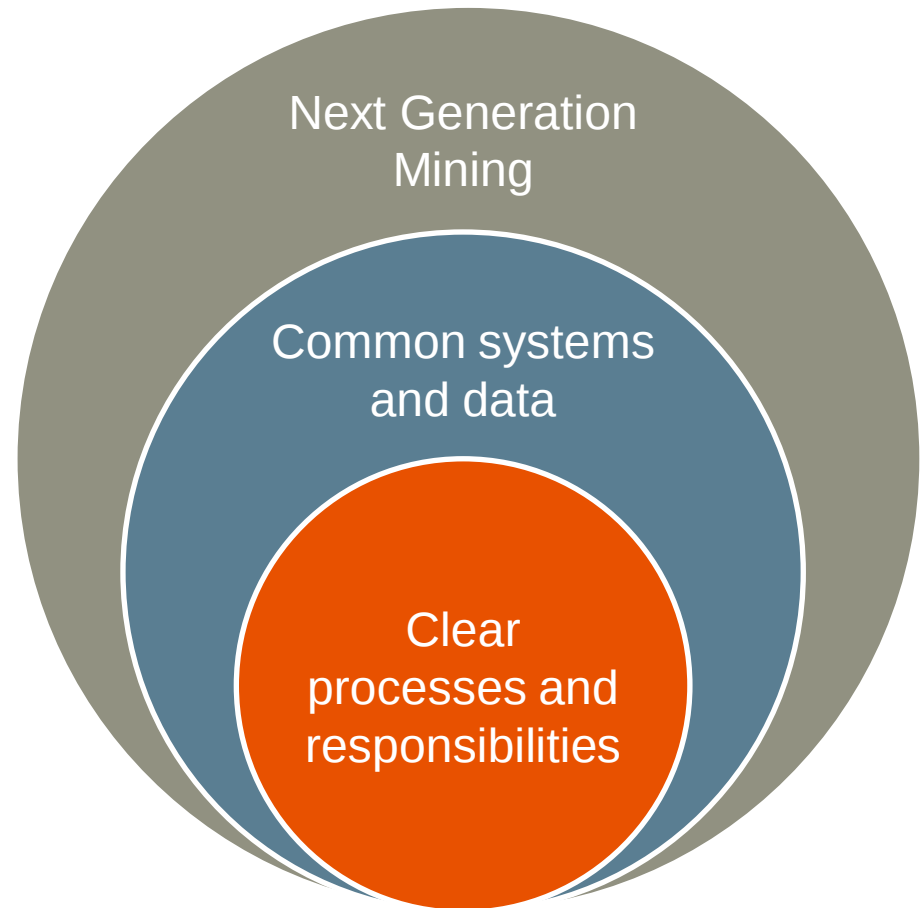
█ BHP Billiton berths
 █ Option secured for 2 additional BHP Billiton berths at Burgess Point

## Port Hedland Outer Harbour



Not to scale.  
 For illustration purposes only.

- Common philosophy, systems and processes across the company
- Transparent and granular data facilitates company-wide benchmarking
- Ability to leverage technology and best in class practices across all divisions
- Enables productivity gains throughout the organisation



# We have clear processes and responsibilities with common systems and data

*“Our Organisational Design Protocol delivers a simple and accountable organisation that operates in an effective and common way”*

## Economies of scale

Leverage our global expertise through standard roles, alignment of structures and simple systems and processes

## Best practice

Benchmark and implement best practices across the Group

## Enhance performance

Deliver predictable outcomes and operational excellence to improve safety, increase productivity and lower costs

## People

Enable our people to perform at their best

## Illustrative capacity benchmarking (%)

|              | CD1 | CD2 | CD3 | CD4 |
|--------------|-----|-----|-----|-----|
| Availability | 82  | 81  | 80  | 85  |
| Utilisation  | 52  | 45  | 54  | 66  |

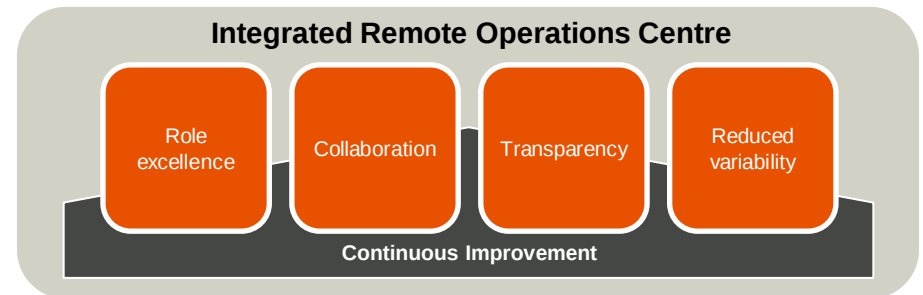
|                             | CD2 | CD4 |
|-----------------------------|-----|-----|
| Downtime: No train in yard  | 15  | 1   |
| Downtime: Railroad          | 12  | 9   |
| Downtime: Spotting          | 3   | 5   |
| Downtime: Equipment related | 8   | 5   |

■ Best performer ■ Worst performer

# Next Generation Mining: Integrated Remote Operations Centre (IROC) fully operational



- IROC is fully operational
- Delivered under budget and ahead of schedule
- Real-time management of supply chain (pit to port) to reduce supply chain variability
- Optimised scheduling (production and maintenance) to improve productivity
- Co-location of controllers, schedulers and planners to improve collaboration, decision making and role consolidation
- Deployable at all BHP Billiton large mining hubs with our Metallurgical Coal business next to benefit from implementation



# Next Generation Mining: autonomous equipment and rapid resource modelling

## Autonomous equipment

- Clear, simple processes enable the introduction of scalable autonomous technology
- Autonomous haul trucks (AHT) have been trialled in our New Mexico coal operations since mid CY11
- AHT trial at WAIO to commence in H2 CY13
- Delivering safer, more predictable, more productive operations

## Rapid resource modelling

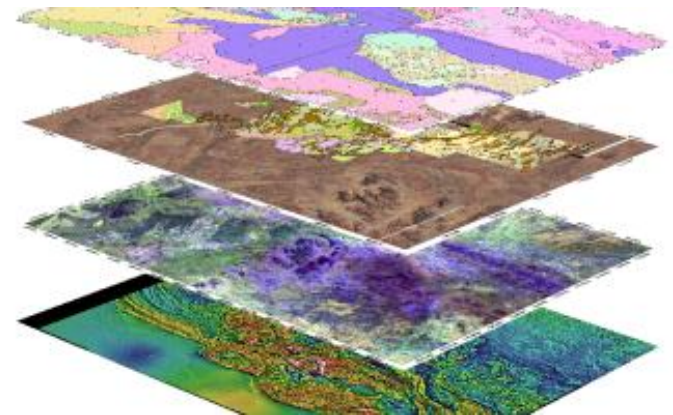
- Real-time elemental measurement with down hole tools, and accurate measurement of mineralogy
- Automated interpretation of drill data based on pattern recognition algorithms
- Automated, integrated 3D modelling
- Fast results, better quality, repeatable models
- More effectively deliver product specifications

## Autonomous Caterpillar truck at New Mexico Coal



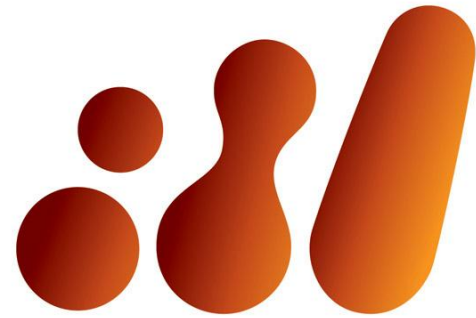
Image courtesy of Caterpillar Inc.

## Automated drill data interpretation



# Key themes

- Industrialisation and urbanisation will continue to support the expansion of our world-class iron ore business in the Pilbara
- Major projects in execution are on schedule and on budget
- Significant opportunity for high-return, capital-efficient growth
- Ongoing program of debottlenecking and optimisation is delivering value
- Common processes, systems and data combined with next generation mining technologies will deliver substantial productivity gains across the organisation



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resourcing the future