



## Escondida site tour

**Edgar Basto** President Escondida  
1 October 2012



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# Disclaimer



## Exploration Targets and Mineral Resources

This presentation includes information on Exploration Targets (Potential Mineralisation) and Mineral Resources. Mineral Resources are compiled by: L Soto (MAusIMM), M Cortes (MAusIMM) and R Preece (FAusIMM) – Escondida mineral district. This is based on Mineral Resource information in the BHP Billiton 2012 Annual Report. Mineral Resource information for the Escondida district includes Escondida, Pampa Escondida, Pinta Verde and Chimborazo resources as disclosed in the BHP Billiton 2012 Annual Report and can be found at [www.bhpbilliton.com](http://www.bhpbilliton.com).

Exploration Targets (Potential Mineralisation) are compiled by J des Rivieres (IGI) (Escondida has been previously reported in BHP Billiton's Bank of America Merrill Lynch Global Metals, Mining & Steel Conference Presentation, 15 May 2012).

All information is reported under the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves, 2004' (the JORC Code) by the above-mentioned persons who are employed by BHP Billiton and have the required qualifications and experience to qualify as Competent Persons for Mineral Resources or Exploration Results under the JORC Code.

The compilers verify that this report is based on and fairly reflects the Exploration Targets and Mineral Resources information in the supporting documentation and agree with the form and context of the information presented.

Mineral Resource classification and Potential Mineralisation Ranges (100% basis) for each province, where relevant, are contained in Table 1.

**Table 1**

Province	Measured Resource (Mt)	Indicated Resource (Mt)	Inferred Resource (Mt)	Range of Potential Mineralisation (Bt)			BHP Billiton interest
				Low	Mid	High	%
Escondida district	4,069 @ 0.72% Cu	4,986 @ 0.57% Cu	12,635 @ 0.47% Cu	16 @ 0.4-0.6% Cu	23 @ 0.4-0.6% Cu	43 @ 0.5-0.6% Cu	57.5

The range of Potential Mineralisation is estimated from geological information including boreholes, outcrops and geophysical information. The potential quantity is conceptual in nature, there has been insufficient exploration to define a Mineral Resource and it is uncertain if further exploration will result in the determination of a Mineral Resource. It should not be expected that the quality of the Potential Mineralisation is equivalent to that of the Mineral Resource.

# Chilean site tour program



## Day 1: Sunday, 30 September 2012

Welcome and safety induction	Brendan Harris
Non-ferrous overview	Andrew Mackenzie
Well positioned to deliver low risk copper growth	Peter Beaven
Base Metals performance overview	Margaret Beck
Low risk, high return projects	Peter Beaven
Our confidence in the long term outlook for copper	Shaun Verner
Coloso Port site tour	Pedro Damjanic
Chile update	Maria Olivia Recart
Santiago project hub	Carlos Mesquita
Examining the broader portfolio	Peter Beaven

## Day 2: Monday, 1 October 2012

Escondida presentation	Edgar Basto
Escondida site tour	

## Day 3: Tuesday, 2 October 2012

Pampa Norte presentation	Ivan Arriagada
Spence site tour	

# Escondida visit

Time	Description
07:00 – 09:30	Coach transfer from Terrado Suites to Escondida
09:30 – 11:00	Escondida management presentations
11:00 – 12:00	Lunch with Escondida management
12:00 – 15:00	Escondida site tour
15:00 – 15:30	Afternoon tea
15:30 – 18:00	Coach transfer from Escondida to Terrado Suites

# Visitor safety induction

- Stay with your escort at all times – especially if an emergency occurs
- You will be advised when to wear
  - a reflective vest and safety helmet
  - safety glasses (fit over prescription glasses)
  - face mask
  - gloves
  - hearing protection
- Use handrails when on stairs
- Keep clear of all machinery
- We have a no smoking policy inside buildings and vehicles
- Cameras can be used outside buildings

# Key themes

- A well established, experienced and diverse management team
- Leading industry HSEC performance
- Operation is performing well following temporary challenges in FY12
- The release of latent capacity will deliver material unit cost savings
- Low risk, high return growth projects will sustain strong momentum at Escondida
- A highly successful exploration program has delivered a substantial increase in the resource base, enabling longer term development options

# Escondida leadership team

Well established, experienced and diverse



**President  
Escondida**  
Edgar Basto



**Head of  
Finance**  
Maree  
Robertson



**Head of  
Production**  
Pedro Damjanic



**Head of HR**  
Jorge Lopez



**Head of HSEC**  
Marcelo  
Ocampo



**Head of  
Projects**  
Claudio Monken



**Head of  
Resource  
Planning and  
Development**  
Jorge Betzhold



**Manager  
External Affairs**  
Patricio  
Vilaplana

# Strong focus on health, safety, environment and the community

## Health



- Use of forced air helmets in electrowinning plant to reduce exposure to acid mist
- Implementation of plans to minimise exposure to silica, noise and acid mist
- Monitoring and managing fatigue

## Safety



- Monitoring cameras installed in key risk areas of the plant such as the stripping machine
- Implementation of escorts for oversized loads on route B-475
- Traffic reduction on route B-475 with the replacement of light vehicles with buses

## Environment



- Water recovery projects implemented in the tailings dam
- Energy efficiency projects implemented in the SAG mills

## Community

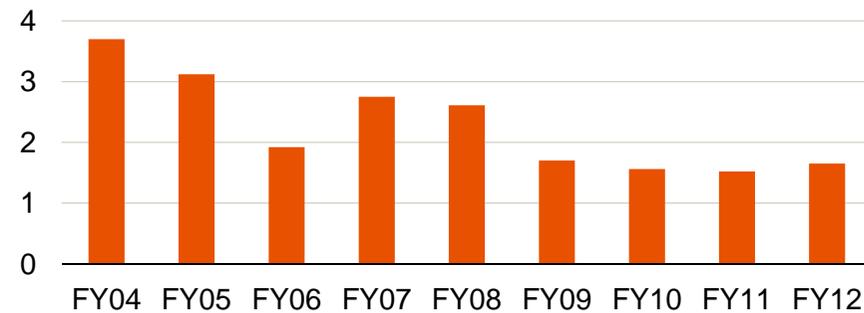


- Good relationship with the community supported by our foundations and local community programs

# Industry leading HSEC performance

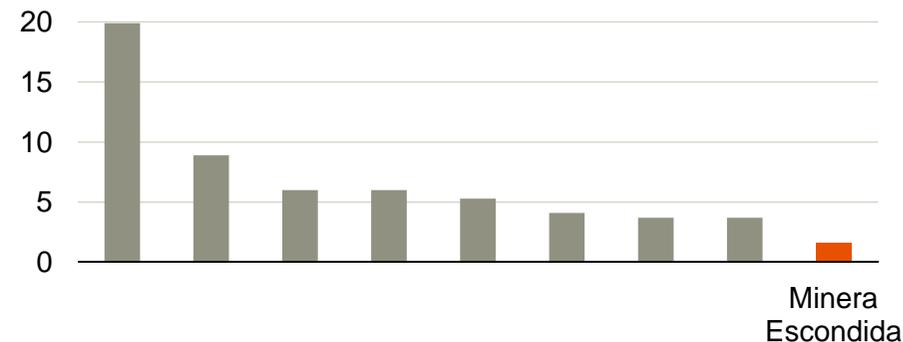
- Reduction in Significant Incidents and benchmark TRIF despite increased level of activity from major projects
- Significant development in Material Risk Management in all areas, with particular focus on fatality risks
- Progressive implementation of plans to minimise exposure to silica, noise and acid mist
- Focused health program which includes contractors in base line assessments and improvement initiatives

**Escondida Total Recordable Injury Frequency (TRIF)**  
(number of recordable injuries per million hours worked)



**Mining industry TRIF benchmarks<sup>1</sup>**

(number of recordable injuries per million hours worked)



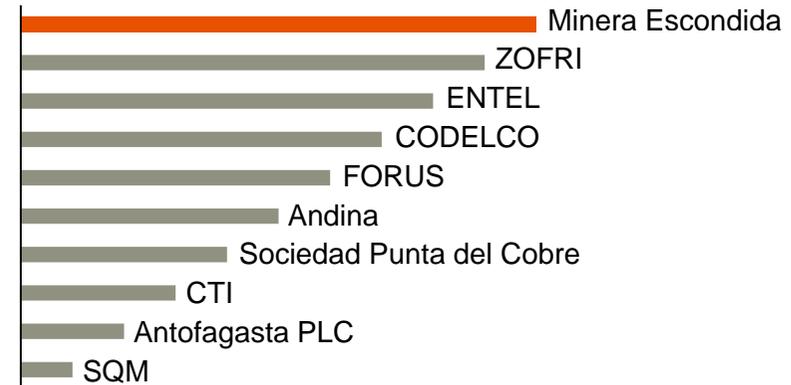
Source: Annual reports.

1. BHP Billiton benchmark information consists of the following companies TRIF for CY09 data (in no particular order): Rio Tinto, Newmont, Freeport, Vale, Barrick, Xstrata, AG Ashanti, BHP Billiton.

# Good community citizen

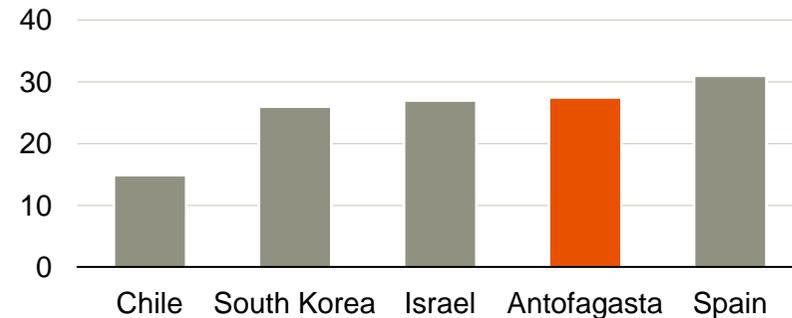
- Recognised as the leading mining company in Chile
- We have good relationships with the community, supported by our foundations and local community programs
- Minera Escondida has established two foundations:
  - “Fundación Minera Escondida” (FME)
  - “Centro Entrenamiento Industrial Minero” (CEIM)
- Development of an “Antofagasta Master Plan” with private and public enterprises as well as the OECD, for the sustainable and collaborative growth of Antofagasta
- Our investment in community development projects is expected to be +US\$40 million in FY13

## Chile’s most respected companies (2012)



Source: Enconsult, as reported in the Que Pasa Magazine, July 2012

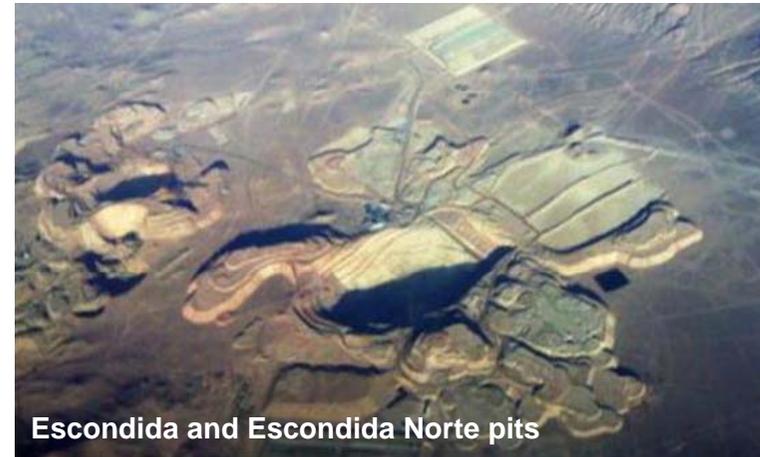
## Antofagasta’s GDP per capita driven by mining (US\$ thousand)



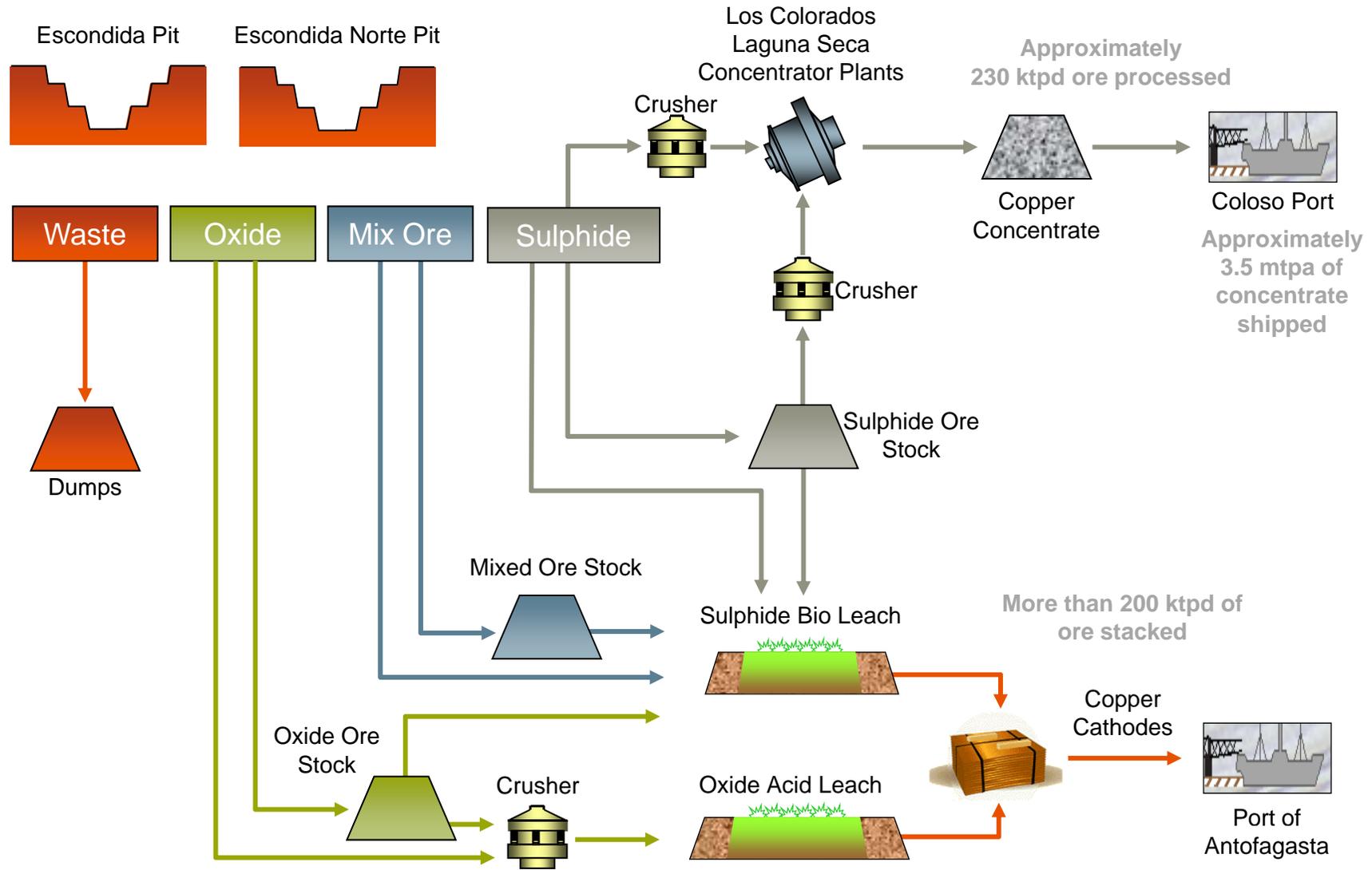
Source: INE, Banco Central.

# Escondida: the world's leading copper mine

- Largest copper mine in the world
  - Escondida pit
    - › depth 645 m
    - › dimensions 3.9 km x 2.7km
  - Escondida Norte pit
    - › depth 525 m
    - › dimensions 2.5 km x 2.2 km
- BHP Billiton 57.5% interest and operator
- 4,000 employees and 10,000 contractors
- Historical material movement in excess of 1.3 mtpd, over 50% more than our Western Australia Iron Ore bulk commodity business
- Two pits feeding two concentrators (Los Colorados and Laguna Seca) and two leaching operations (oxide and sulphide)
- Two cathode producing electrowinning plants
- Port facilities to export over 1 mtpa of copper in concentrate



# Escondida: operations overview



# Escondida: mine operations overview

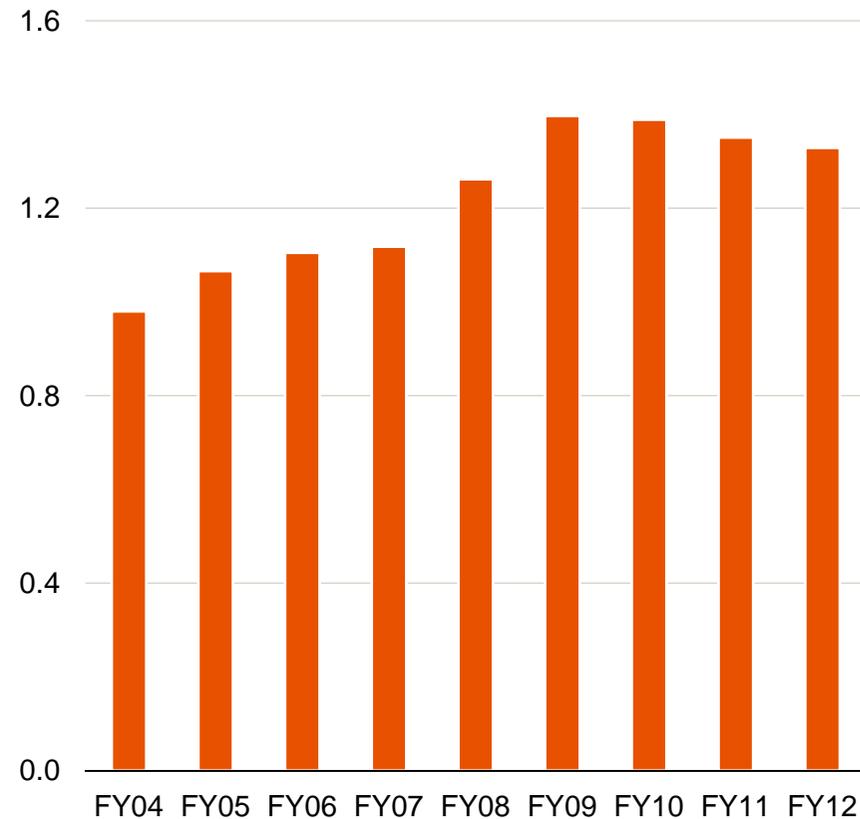
## Mine mobile equipment

- 18 shovels
- 171 trucks
- 5 front end loaders
- 20 drills
- 22 bulldozers
- 19 wheel tyre dozer
- 14 graders
- 13 water trucks

## Mine fixed equipment

- 5 primary crushers
- 35 km conveyor belts

Total material moved per day  
(mtpd)



# Escondida: concentrator plants overview

## Los Colorados

- Started operations in 1990
- 120 ktpd design capacity
- Average monthly energy consumption of 62,000 MWh

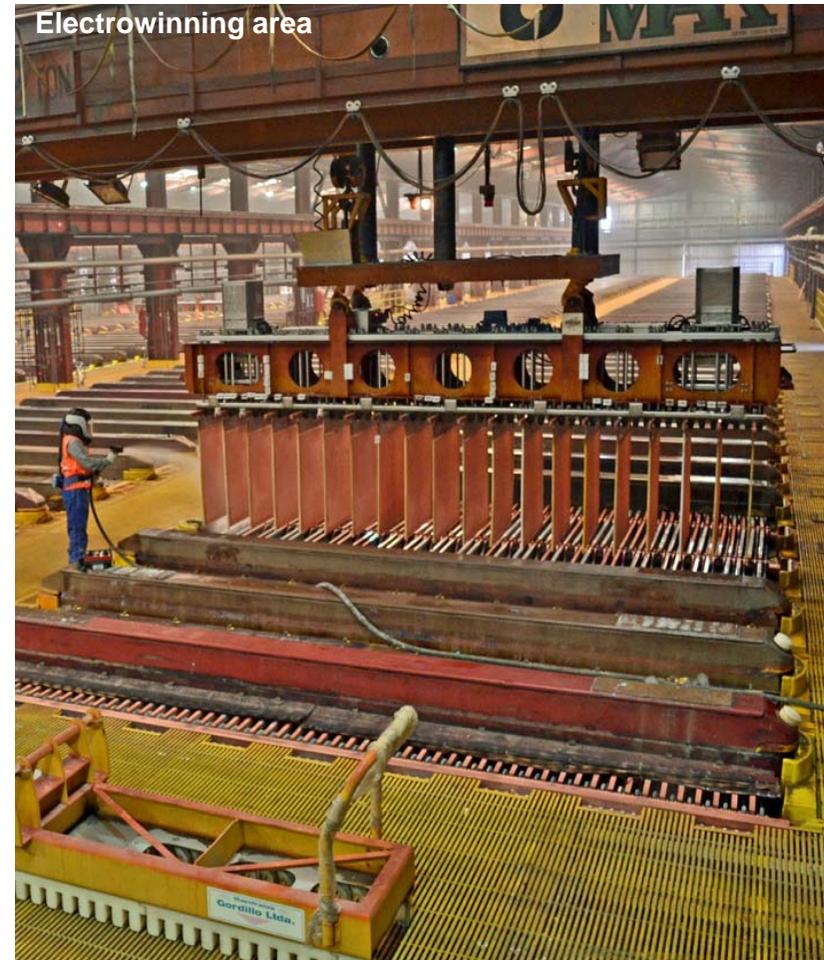
## Laguna Seca

- Started operations in 2002
- 110 ktpd design capacity
- Average monthly energy consumption of 62,000 MWh



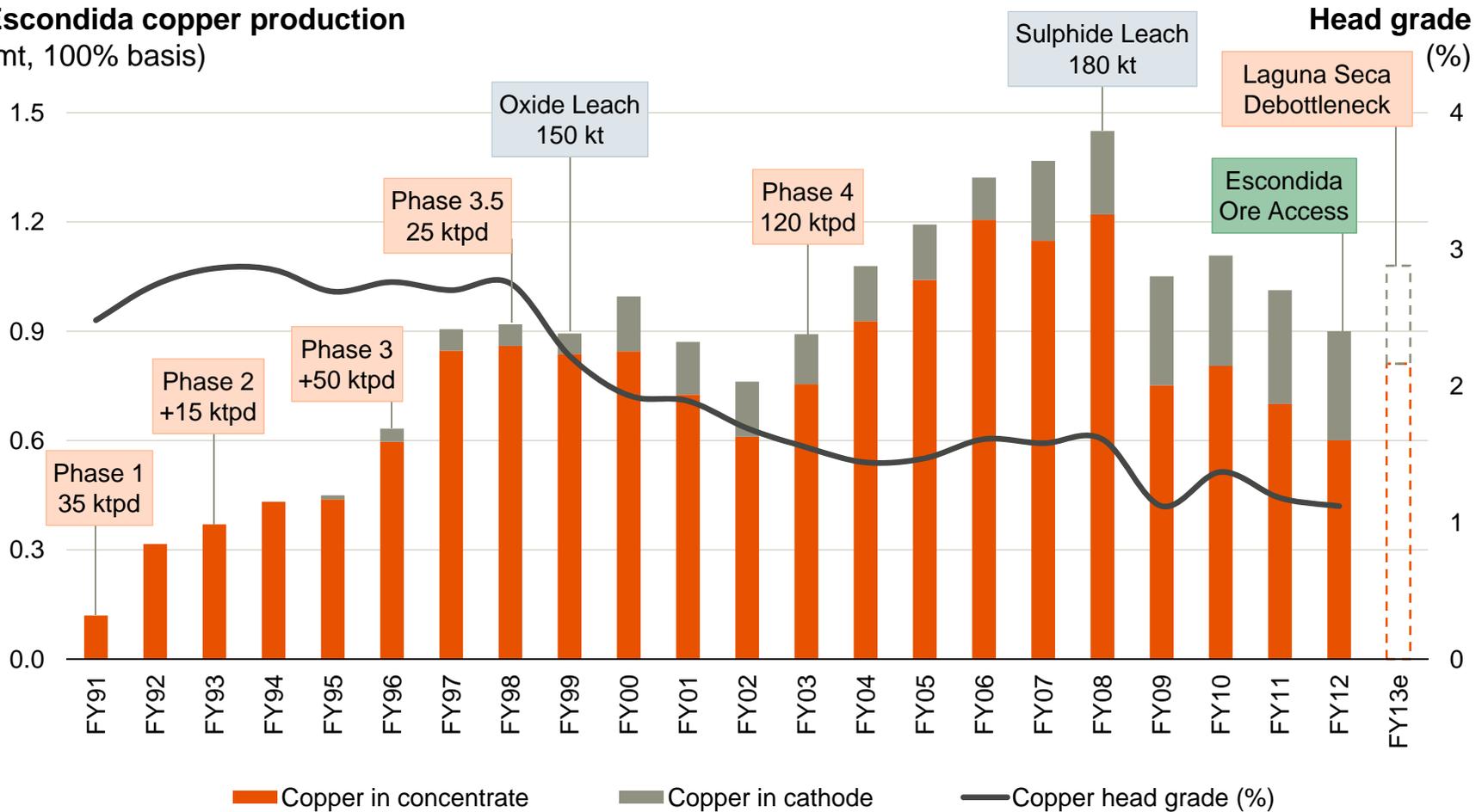
# Escondida: hydrometallurgy processes overview

- Two solvent extraction plants (oxide and sulphide)
- Sulphide and oxide ore leached in separate pads
- Electrowinning with a nominal capacity of 330 ktpa
- The cathodes produced are transported to Antofagasta port for shipping



# Strong growth over the last 20 years

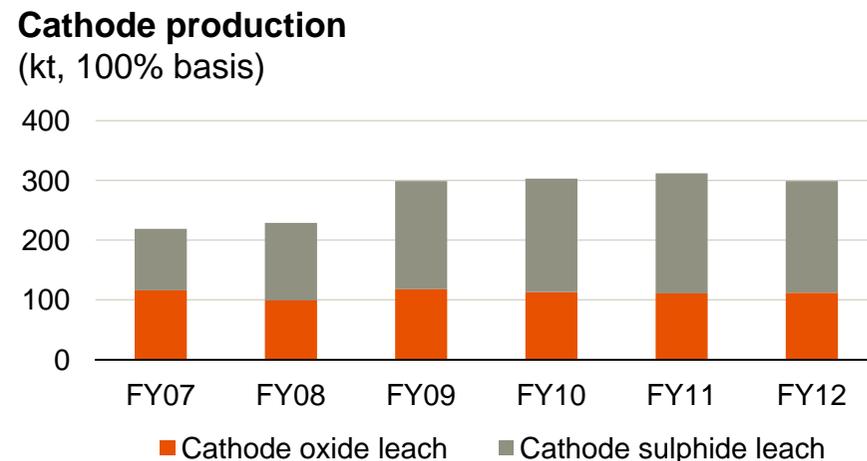
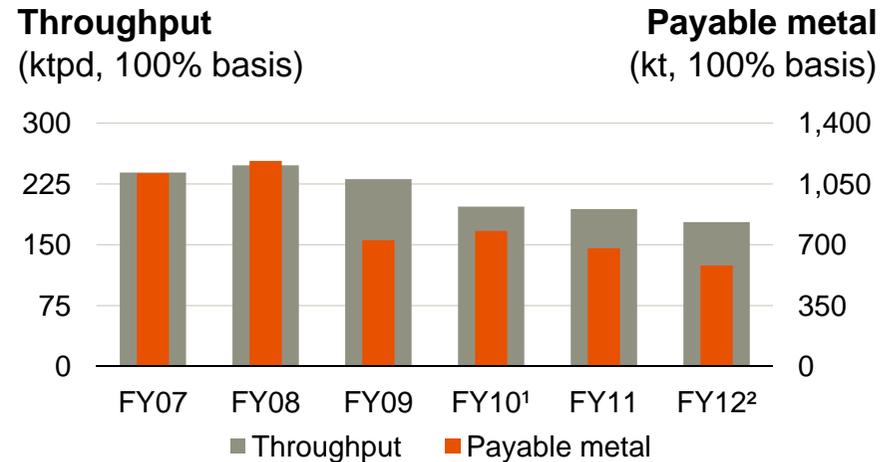
## Escondida copper production (mt, 100% basis)



Note: Copper in concentrate is copper contained, copper in cathodes is payable metal.

# Concentrate production and throughput affected by temporary challenges

- In recent years, throughput affected by
  - crushing and conveying equipment reliability issues due to aging of the system
  - ore hardness, with SAG Power Index (SPI) increasing 30% over the last six years, slowing throughput through the mills
  - recent industrial action, which halted operations for 15 days during July and August 2011
- Steady and predictable production in cathodes

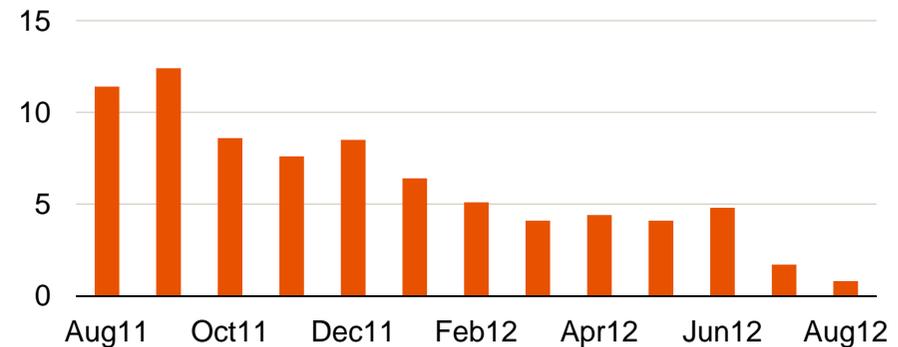


1. 2010 affected by SAG mill stator repair.  
2. 2012 affected by the illegal strike.

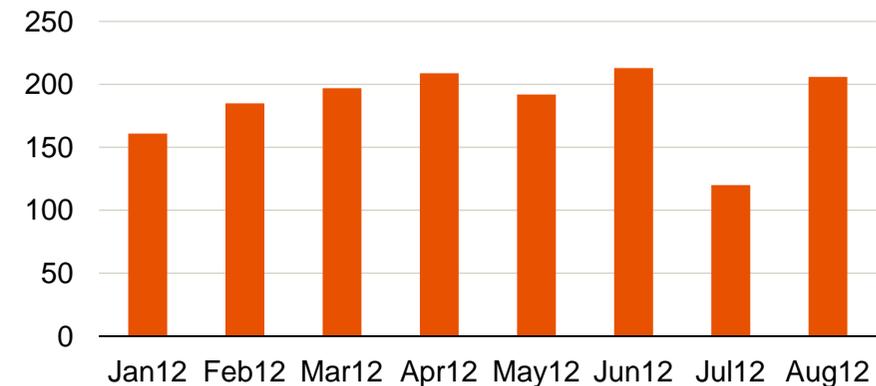
# Strong recovery underway

- Successfully carried out the largest maintenance shut-down in the history of Escondida during July and August 2012
  - will impact production in Q1 FY13 as planned
  - no change to FY13 production guidance
- Maintenance work focused on re-establishing reliability in the crushing and conveying system and both concentrator plants
  - involved +2,200 employees and contractors
- Collaborative working relationship with the union post the illegal strike

**Equipment vulnerability index (crusher and conveyor)<sup>1</sup>**  
(%)



**Throughput**  
(ktpd, 100% basis)

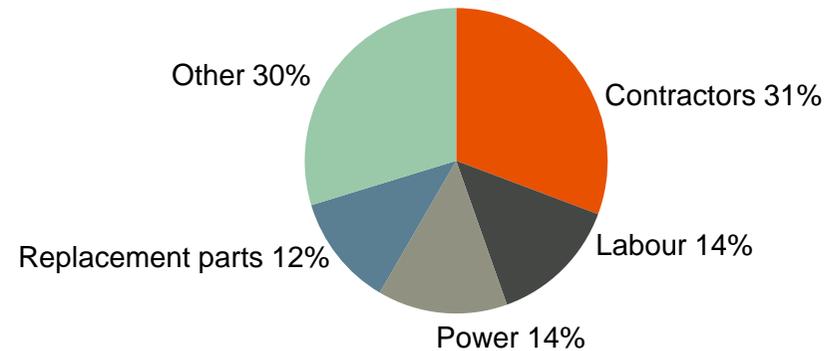


1. Index defined as percentage of crushing and conveying equipment not operating according to standards.

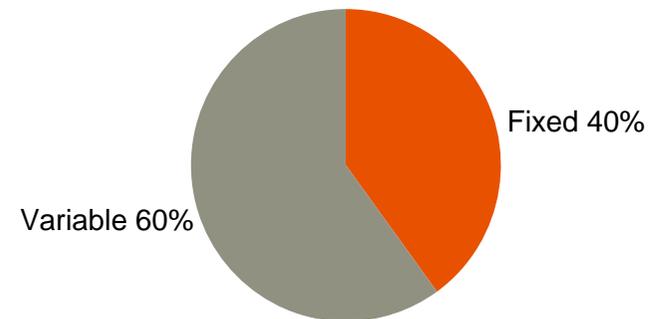
# Unit costs affected by industrial action and one-off events

- Copper unit cash costs increase by 24% in FY12 due to a number of temporary challenges
  - grade decline
  - labour unrest
  - equipment reliability issues
- Ongoing industry cost pressures
  - higher input prices of fuel, energy and acid
  - Increased labour costs due to the tight market in Chile
  - Higher Chilean Peso exchange rate
- Escondida's cost breakdown
  - US Dollar indexed costs: 55%
  - fixed costs: 40%

**Cost breakdown (FY12)**



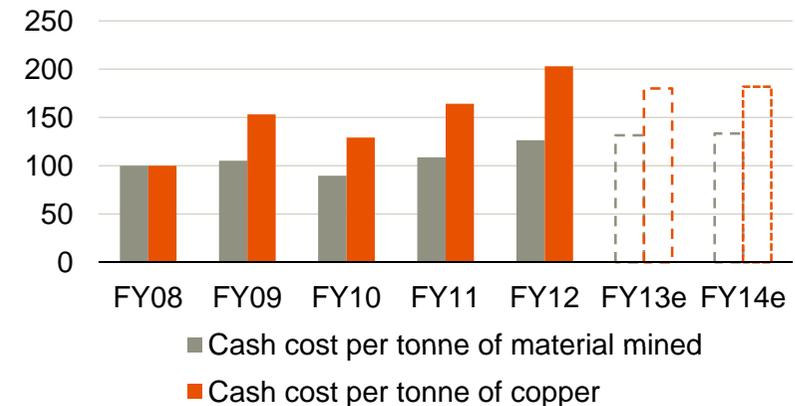
**Cost breakdown (FY12)**



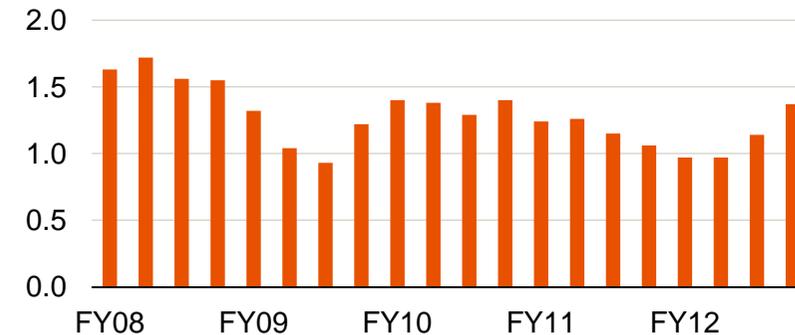
# Targeting significant unit cost savings

- Economies of scale benefits
  - access to higher grade ore with the completion of Escondida Ore Access project
  - increased throughput capacity with completion of Laguna Seca Debottlenecking project
- Reversal of one-off costs that occurred during FY12
  - industrial action
  - instability of the crushing and conveying system restricting ore throughput
- Other cost improvements
  - substantial reduction in operating and non-essential expenditure targeted in FY13
  - improvements to key value drivers identified during the planning process
- Challenges remain
  - continued tight labour market in Chile
  - high power costs
  - increase in water costs with desalination

**Unit cash cost**  
(index, FY08=100)



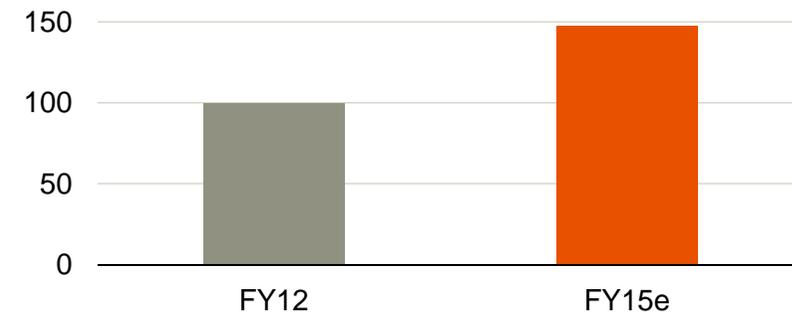
**Escondida's average copper grade**  
(%)



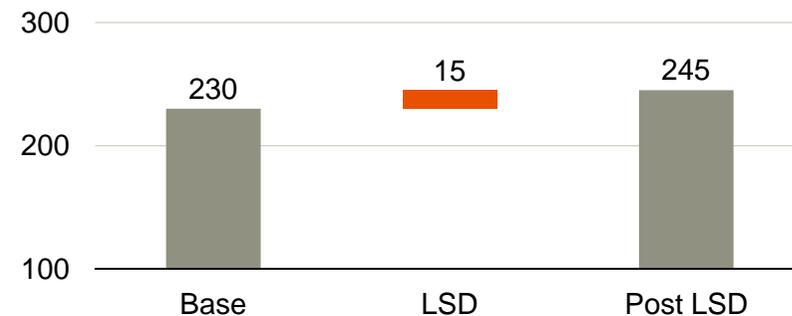
# High return, rapid payback projects underpin significant momentum in the business

- Escondida Ore Access completed in the June 2012 quarter, providing access to high grade ore (over 1% copper head grade)
- Laguna Seca debottlenecking project (LSD) completed in September and adds 15 ktpd of capacity
- Forecast copper production growth of 20% in FY13
- Targeting copper production of over 1.3 mt in FY15 (100% basis)

**Escondida forecast copper production<sup>1</sup>**  
(index, FY12=100)



**Escondida throughput capacity**  
(ktpd, 100% basis)



1. Includes incremental capacity from the Laguna Seca debottlenecking project and the new 152 ktpd plant that will replace the Los Colorados concentrator.

# Escondida Ore Access project provides access to higher grade ore

- Escondida Ore Access project on time and on budget
  - investment of US\$554 million (100% basis)
- Project relocated the two existing in-pit crushing stations (2 and 3) to a location outside of the current projected pit limits allowing access to high grade ore
  - provides access to 7.4 million tonnes of copper production over the life of the asset
- Project economics
  - projected return +20%
  - payback approximately 4 years



# Laguna Seca Debottlenecking project delivers increased throughput and improved recoveries

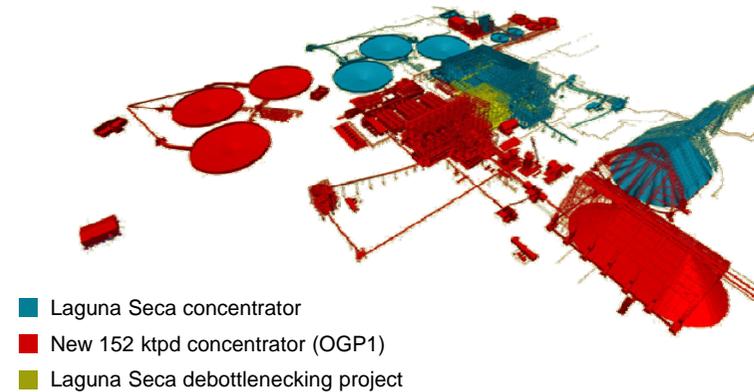
- Laguna Seca Debottlenecking project increases throughput by 15 ktpd and improves overall recoveries
  - completed on time and on budget
  - investment of US\$300 million (100% basis)
  - 3 months ramp up after commissioning
- Project included the installation of a fourth ball mill, a fifth regrind mill and a second pebble crusher at the existing Laguna Seca concentrator
- Project economics
  - projected return +20%
  - payback approximately 5 years



# OGP1 generates strong returns

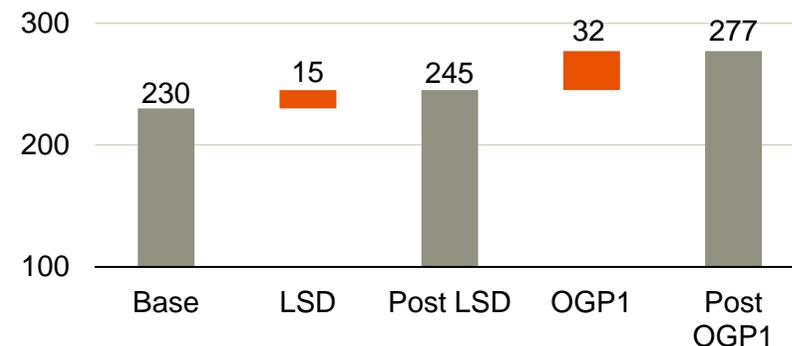
- Construction of a 152 ktpd concentrator to replace Los Colorados Concentrator (LCC) and provide early access to high ore grade
  - on track and on schedule
  - investment of US\$3.8 billion (100% basis)
  - commissioning in H1 CY15
  - 11 month ramp up after commissioning
- Demolition of LCC will provide access to a set of seven pushbacks
  - the first pushback (PL1) contains ore of 223 mt at 1.0% copper grade
  - initial location of LCC was driven by NPV of the day
- Project economics
  - projected return approximately 20%
  - payback approximately 7 years

## OGP1 – setting a new benchmark for the industry



## Escondida throughput capacity

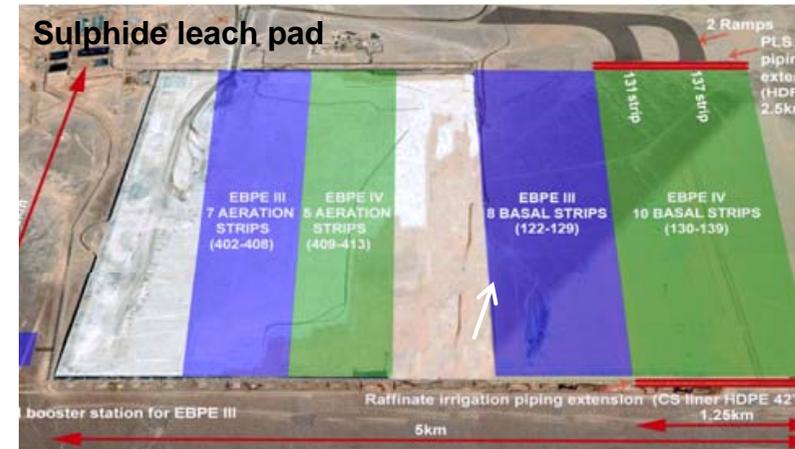
(ktpd, 100% basis)



# Extending the life of our leaching operations

## Escondida Bio Leach Pad Extension III

- Provides additional strips (pad surface area), equipment and new facilities to sustain production of the sulphide leach plant
- Investment of US\$354 million (100% basis)
- Completion in H1 CY13



## Oxide Leach Area Project (OLAP)

- Provides additional area to process oxide ore of 105 mt
- Investment of US\$721 million (100% basis)
- Completion in H1 CY14



# Infrastructure projects to enable Escondida's growth plan

## Escondida Water Supply

- Expansion of the current desalination plant to meet Escondida's future water demands

## New Facilities Mine Maintenance

- Construction of a replacement maintenance facility to allow access to high grade ore under existing facilities located adjacent to Los Colorados concentrator

## Escondida Norte Facilities Management

- Removal of the current in-pit crusher in Escondida Norte to access high grade ore

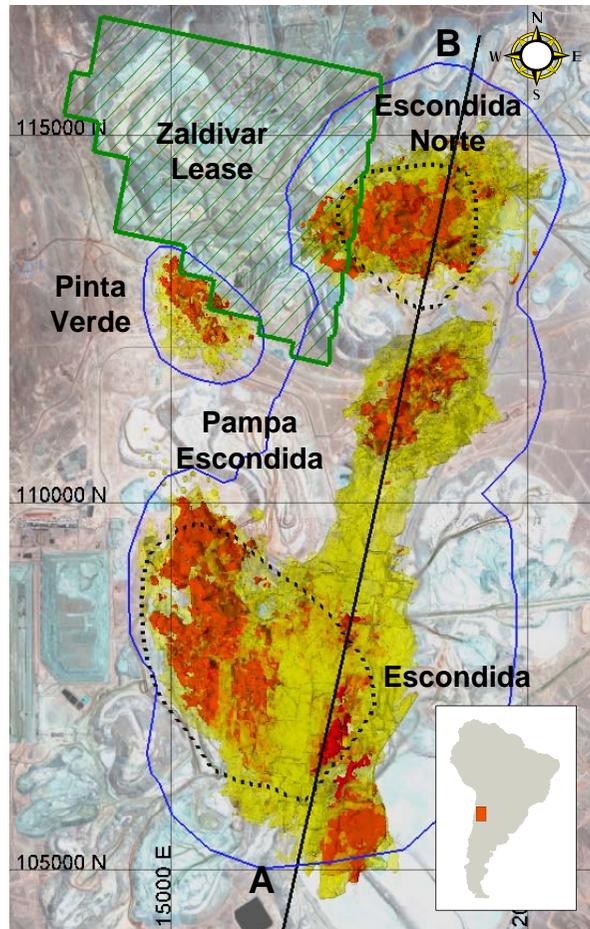
Antofagasta



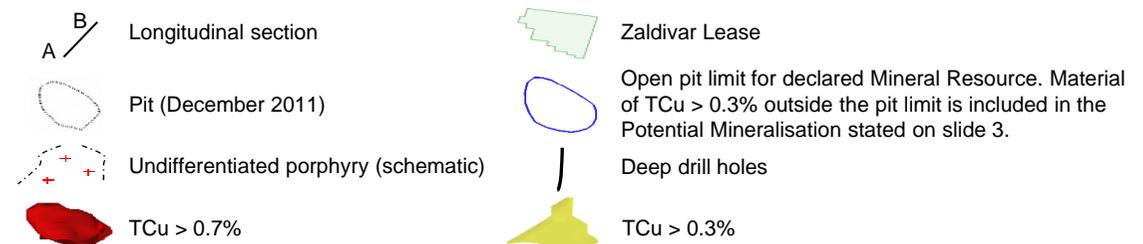
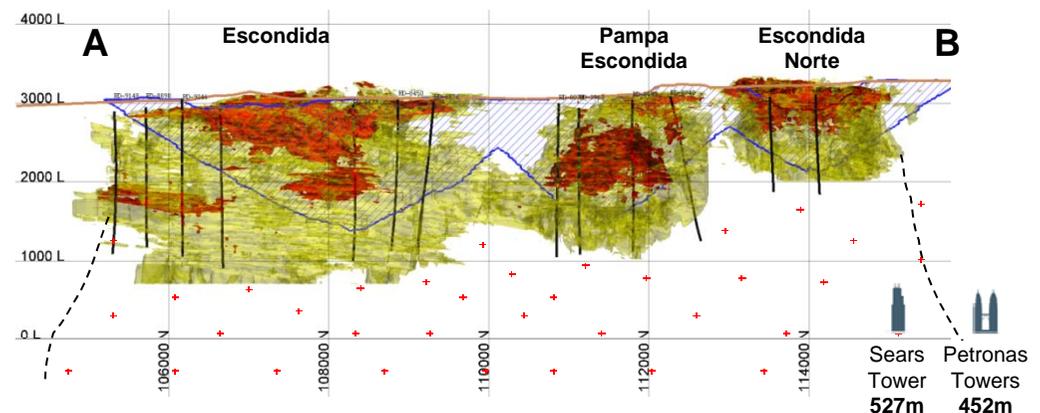
Escondida Norte



# A highly successful exploration program has delivered a substantial increase in resource base



- High quality resource base with 21.7 bt @ 0.54% copper<sup>1</sup>
- Substantial increase in Escondida mineral district resources including:
  - 11% increase in resources from 30 June 2011<sup>1</sup>
- Significant open cut development potential and long term underground opportunity



1. BHP Billiton 2012 Annual Report. Refer to disclaimer slide 3 as presented on 1 October 2012.

# Substantial future growth potential

- Significant copper resource base
  - providing +100 years of production<sup>1</sup>
  - multiple plant expansion opportunities
- Longer term growth will require investment in additional throughput capacity
  - enabling technology studies underway
- Santiago hub has the potential to facilitate the development of multiple concentrators
  - standardisation and replication will drive benchmark performance
- Production will continue to be supplemented by leaching and cathode processes



1. The potential time of production is estimated from the Mineral Resources stated on a 100% basis as shown in the BHP Billiton FY12 Annual Report and in Table 1 of the disclaimer on slide 3. The minimum production period in years is the Mineral Resource divided by the FY12 ore processing rate and does not imply that any mine planning has been completed. Refer to disclaimer on slides 3 as presented on 1 October 2012.

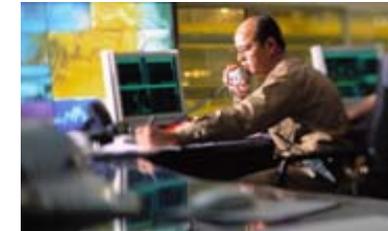
# Enabling long term growth by applying technological solutions to key constraints



- Intensity and costs of mining operations



- Intensity and costs of processing future low grade, harder ores



- Complexity of operations

## Growth constraint

## Technology enabler

- Bulk material handling systems

- Selective partitioning of ore technologies
- Energy efficient size reduction circuits and equipment
- Low grade chalcopryrite leaching

- Integrating connectivity, data management, analytics and machine decision making
- Automation of mine site (autonomy, robotics)

## Key value drivers

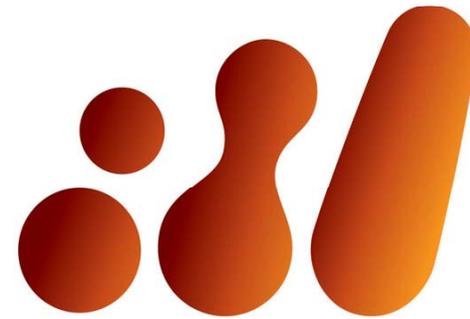
- Operating cost (energy, productivity)
- Mining intensity
- Human resource (availability, safety)

- Grade (plan compliance)
- Operating cost (energy, water, productivity)
- Recovery

- Stability
- Productivity
- Human resource (availability, safety)

# Key themes

- A well established, experienced and diverse management team
- Leading industry HSEC performance
- Operation is performing well following temporary challenges in FY12
- The release of latent capacity will deliver material unit cost savings
- Low risk, high return growth projects will sustain strong momentum at Escondida
- A highly successful exploration program has delivered a substantial increase in the resource base, enabling longer term development options



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resourcing the future