

December 5<sup>th</sup> 2016

Iván Arriagada Chief Executive Officer



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## **Safety First**



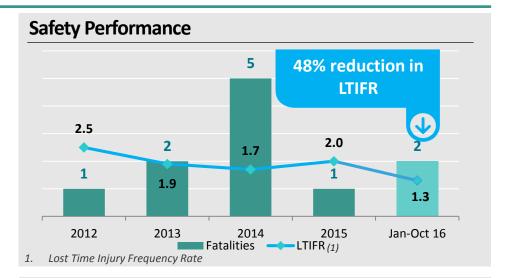
- A fatality occurred at Antucoya in April 2016 and another in the transport division in July
- Committed to zero fatalities target
- 48% improvement in injury rate
- New safety and occupational health model being extended to contractors
- Regular senior management site visits to reinforce Safety First

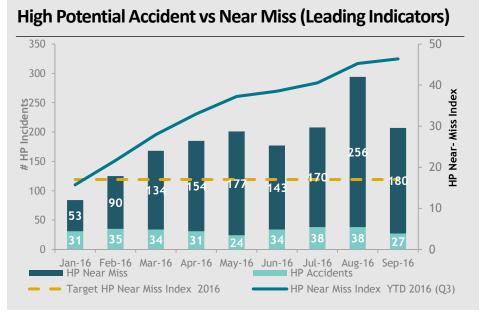
#### **Renewed areas of focus**



- Identify and assess fatality and serious injury risks
- Implement critical controls
- Report and investigate near misses
- Increase on the ground senior leadership

High Potential (HP) Incidents: Total number of HP accidents and HP Near misses





<sup>\*</sup> Near -miss index : Represents total number of high potential near misses for every million hours worked.

<sup>\*</sup> Near -miss index Target 2016: 17

## **Key Messages**



Emphasis on profitable tonnes

Focus on cost and operational reliability

Positioned for growth

Creating long term value through Sustainability

Leaders in innovation

- Only profitable production
- Every tonne must make an earnings contribution
- Rebase costs
- Protect margins
- Planning and forecasting
- Advance organic growth projects for approval
- Robust balance sheet
- New community engagement model
- Social licence to operate or grow
- History of innovation
- Enables sustainability and lower costs
- Embedded practice



# Chilean Context



#### **Chile: Context**





#### **Key Indicators**

• **GDP**: US\$246 Bn (2015)

Population: 17,8 million

Per Capita GDP (PPP):

**1970**: US\$ 2,300 ; **2015**: US\$ 24,000

Mining: 12% of national GDP

Poverty rate:

**1989**: 47%; **2015**: 9%

Principal Export Markets:
 China 23%, USA 20%, Japan 10%

 Trade: 26 FTAs with 64 markets, covering 86% of Global GDP

• Inflation(CPI): 2.8% (Oct 2016)

#### **Copper in Numbers**

- 32% of global copper production
- 30% of global copper reserves
- 53% of national exports

- Largest copper endowment in the world
- Copper key contributor to the economy
- History of being the most stable
   South American country, with robust institutions
- OECD country
- Solid public finances with low national debt

#### Challenges

- Moving from middle income to high income economy
- Dealing with greater social expectations and demands on companies
- Aiming to decrease income inequality

## **Key Issues Impacting Mining in Chile**



#### Regulations

- Recently implemented changes to tax legislation and foreign investment statutes
- Increased environmental compliance and enforcement

#### **Labour Productivity**

- Data shows sustained gap in labour productivity compared to other established mining jurisdictions
- Recent labour legislation changes do not address labour productivity improvement

#### **Power**

- Emergence of renewable power sector with decreasing development costs
- Integrating national power grid increases certainty of supply
- Energy supply tenders for residential customers indicate lower future energy prices

#### Water

- Limited permitting for continental water
- Desalinated water in the north of Chile is becoming the new normal for future mining projects
- Water availability is a function of power and ultimately cost

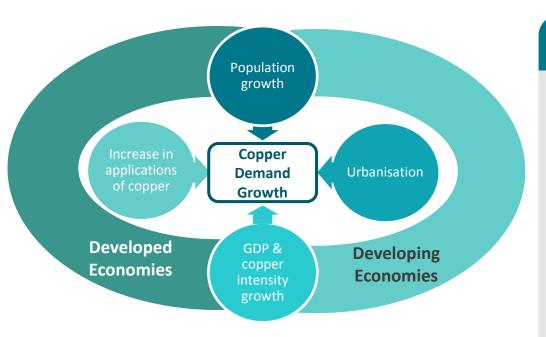
#### Community

- Relationships with communities have evolved from transactional to sustainable partnerships
- Essential to maintain social licence to operate or grow

## Copper market outlook



#### Short term better than expect, optimistic for the long term



#### **Outlook**

- China demand growth stronger than expected in H2 2016
- China mine production down
- Higher public spending in the US and US dollar inflation
- New production absorbed in 2016 without major imbalance
- No significant greenfield production expected in 2017
- Expenditure to sustain existing production under pressure

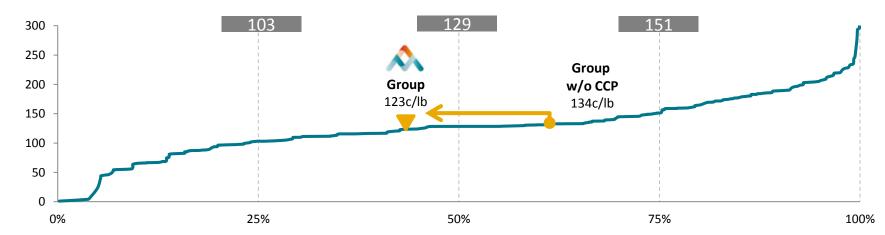
## **Top 10 Global Copper Producer**



#### Top-10 global copper producers, based on estimated 2016 attributable production ('000t) (1)



#### Q3 2016 net cash costs (c/lb) (2)



<sup>1.</sup> Global copper production rankings by company. Source: Wood Mackenzie Q3 2016 Copper Review.

<sup>\*</sup> Low end of 2016 Guidance

<sup>2.</sup> Q3 2016 net cash costs (including by-product credits). Source: Wood Mackenzie

## **Strategy**



### 1 Existing core business

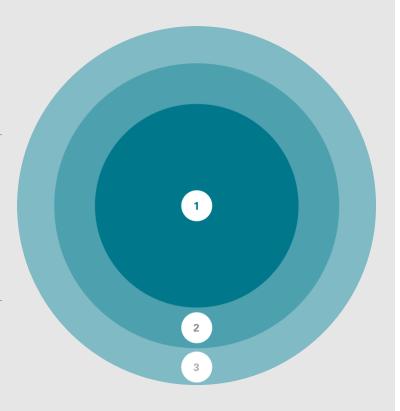
- Constant focus on cost management and compliance
- Delivery on production and cash cost guidance
- Optimise performance of existing assets
- New proactive approach with community and other stakeholders

#### 2 Organic & sustainable growth of the core business

- Ramp-up paste thickeners at Centinela
- Complete Encuentro Oxides and Moly Plant projects
- Advance Centinela Second Concentrator and Los Pelambres Incremental Expansion feasibility studies and permitting

#### **3** Growth beyond the core business

- Progress international exploration activities
- Advance Twin Metals Minnesota project studies
- Monitor potential acquisition opportunities



## **Operational Focus**



#### Los Pelambres



- Implementation of community engagement
- Plant reliability
- Advance Incremental Expansion project



- Operate plant at 105ktpd
- Commission remaining paste thickeners
- Smooth start up of Encuentro Oxides and Moly projects
- Advance 2<sup>nd</sup> Concentrator

#### Antucoya



- Operate plant at steady state
- Focus on costs to consolidate low cost operation

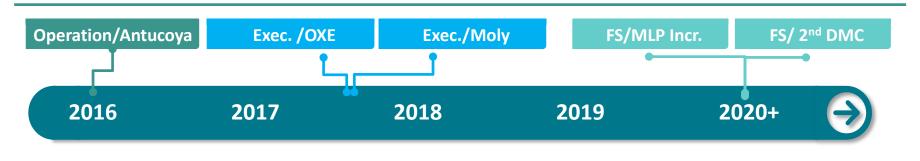
#### Zaldívar



- Increase metallurgical recoveries
- Cost reductions
- Evaluate potential of primary sulphide for the long term

# **Growth Opportunities**





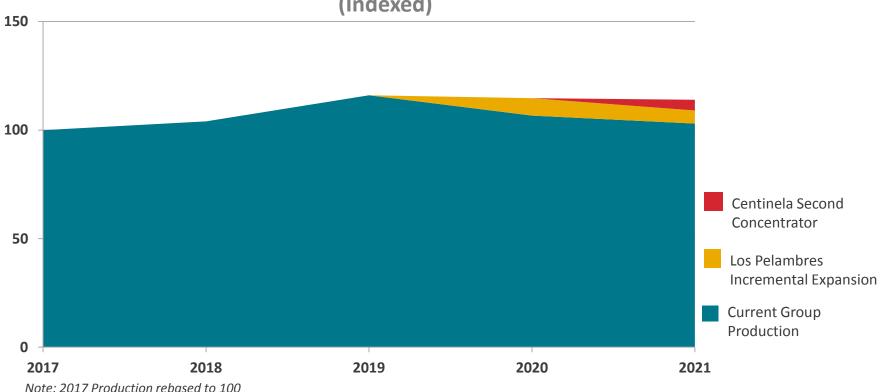
	Project	Stage	Production	Initial Capex	Production
			Start-Up	(US \$ Bn)	(av.Kt Cu/yr)
OXE	Encuentro Oxides Centinela	Construction	2017	0,6	<b>45</b> 50
Moly	Molibdenum plant Centinela	Construction	2017	0,1	2,4 (1)
PDP	MLP Incremental Expansion	FS	2020	1,1	60
DMC	Centinela Second concentrator	FS	2021	2,7	150-160 (2)
TMM	Twin Metals	Scoping	2025+	0,9-1,2	70-80 (3)

- (1) kt fine Mo
- (2) Cu eq (w/Au)
- (3) Cu eq (w/Ni)

#### **Five Year Production Profile**







- Los Pelambres Incremental Expansion and Centinela Second Concentrator projects shown for reference only as are currently in Permitting and Study phase
- Go decisions will depend on project economics, financing options and market outlook



# Key Messages



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# **Sales and Marketing**

December 5<sup>th</sup> 2016

Gonzalo Sanchez Vice President – Sales



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## **Sales and Marketing Team**

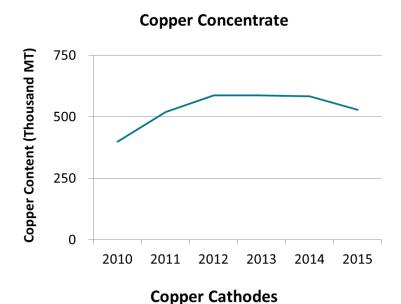


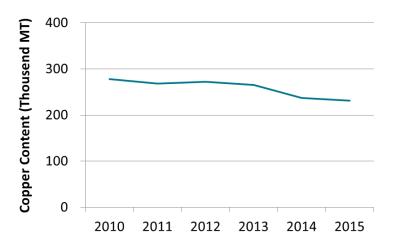
- Experienced commercial team with more than 20 years in the copper and by product industry.
- Centralized at Corporate level providing integrated commercial services for 100% of the production (not only equity share) to all operations and market intelligence for the Group.
- Regional Commercial office for Asian market focusing on market intelligence & client liaison, located in Shanghai, China
- Procurement of sulphuric acid & sulphur.



#### **Product Portfolio**

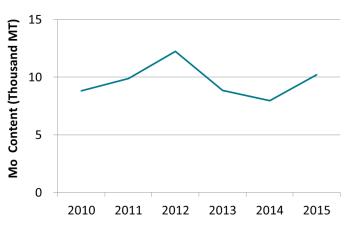






- Antofagasta products and commercial service have a good reputation in the marketplace with a worldwide diversified long term stable and reliable customer base.
- Antofagasta's concentrates are clean of impurities, and production and quality is stable over time.
- Centinela and Zaldivar cathodes are LME & COMEX registered.
   Antucoya successfully introduced in the main markets.
- MLP unroasted leached molybdenum concentrate is clean and high grade, one of the best quality in the market.
- Robust portfolio providing confidence in ability to allocate any potential expansion or growth in production

#### **Molybdenum Concentrate**



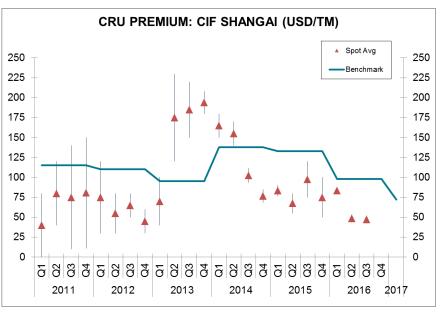
### **Copper Market View**

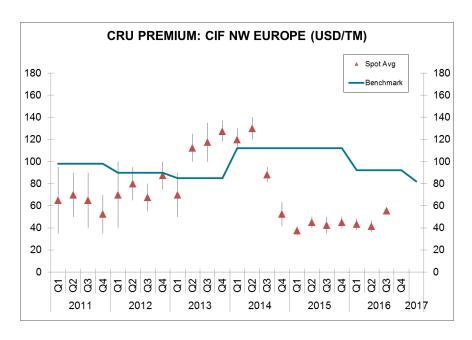


- Recently we have seen an important change in market sentiment towards copper. Investors and speculators came into the market pushing prices up to around US\$6,000 /MT.
- The expected surplus in 2016 has not materialized. Low prices have reduced scrap availability and mine supply has focused on profitable production. The September quarter reports from many producers showed downgrades of production and recently a number of disruptions have occurred.
- China refined consumption better than previously expected. Apparent consumption misled estimates of real consumption, and growth is now estimated to be 4.0% to 5.0% rather than 1.5% to 2.5% as per previous western general assessment.
- Trump's election and his infrastructure spending plan reinforced the change in sentiment for commodities and copper.
- In the short-medium term demand will catch up with the additional production. If real demand in China is growing at around 5% the market will turn into deficit sooner than expected.
- Inability of a quick response from mine supply will support prices.

# Cathode Premiums – CIF NW Shanghai & NW Europe





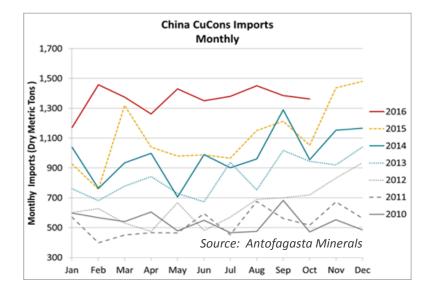


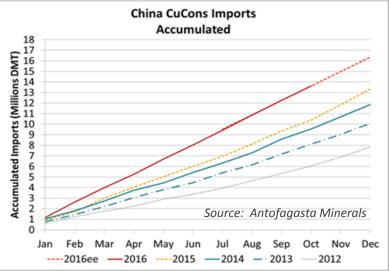
Source: CRU

- Since Q3 2014 spot premiums have been below annual benchmark.
- Reduction in annual premiums for 2017 well accepted in China and costumers are increasing tonnage under such contracts.

# **China Copper Concentrates Imports Booming in 2016**



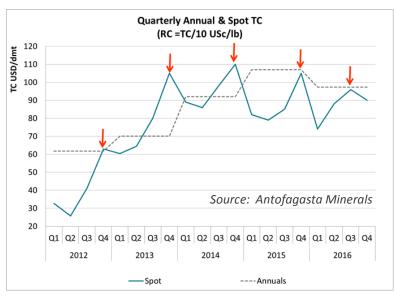


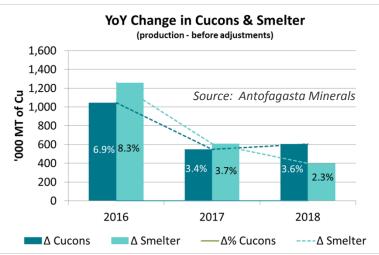


- China on track for a record year of Copper Concentrates import growth
- Projections suggest imports of 16<sup>+</sup> M DMT in 2016
- YoY there is an additional 3<sup>+</sup> M DMT or 750kt of Cu (@ 25% Cu grade)

# **Copper Concentrate TC/RCs Coming Down**







- Peru driving production increases.
- Chile production down by more than 200 kton during 2016.- Important challenges ahead with aging mines and difficult new projects.
- Smelter capacity increases, mainly in China, enough to process all the additional production keeping the market in deficit during 2016.
- Most analysts predict a deficit in 2017.
- According to market reports, TC/RCs with Chinese smelters for 2017 at US\$92.5/DMT and 9.25 cent/lb, which reflects a tighter market (last year agreement was 97.35 & 9.735).

#### **Key Messages**



- Copper market outlook and investor sentiment towards copper improving
- Lower TC/RCs for 2017 Benchmark for Copper Concentrates will benefit copper concentrate producers
- Lower Sulphuric Acid annual contract prices are expected in 2017 in Chile, benefitting SX-EW cathode producers in the region

# **Operations Review**

December 5<sup>th</sup> 2016

Hernán Menares Vice President -Operations





## **Key Messages**



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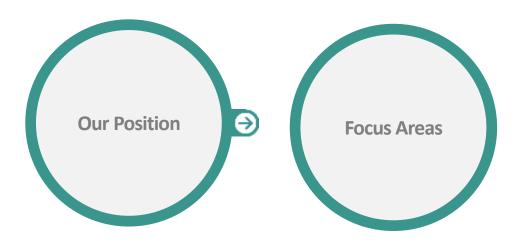
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# Agenda





- Resource Base
- Ore Reserves

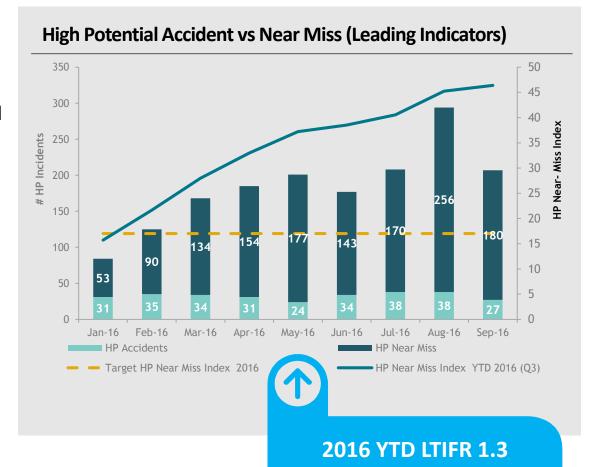
- Operational
- VPO Management

## Safety First: Mining Group Approach



#### Focus on:

- Identify and assess key fatality and serious injury risks.
- Preventative reporting and investigation of highpotential near misses.
- On-the-ground executive safety leadership.
- Development of verification tools for the implementation of critical controls of the transversal fatality risks for each Company.
- Progress in communications and culture.



High Potential (HP) Incidents: Total number of HP accidents and HP Near misses

<sup>\*</sup>Near -miss index: Represents total number of high potential near misses for every million hours worked.

<sup>\*</sup>Near -miss index Target 2016: 17



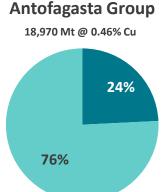
# Our Position



## **Strong Resource Base**

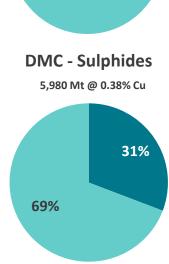


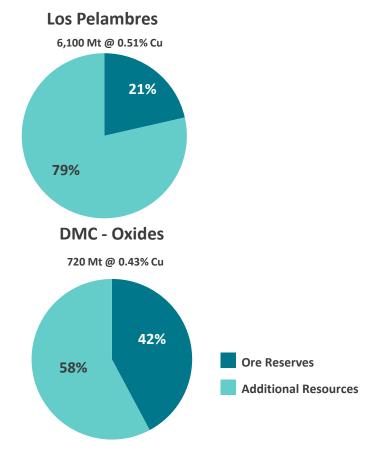
# Significant potential remains to increase Ore Reserves by converting known Mineral Resources through drilling and studies





Increased Ore Reserves in DMC with incorporation of Esperanza Sur (2013) and Encuentro Oxides (2015)

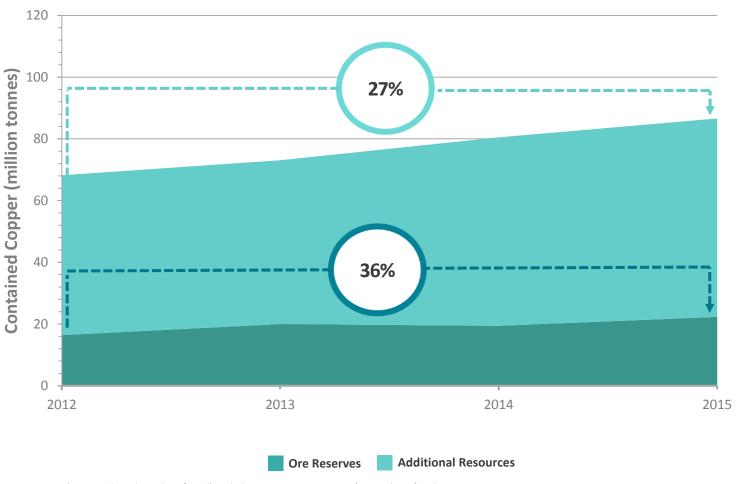




# **Strong Resource Base**



#### Resources and Reserves have increased significantly over time





## Focus Areas



# **Operational Focus**



#### Los Pelambres



- Steady improvement in plant operating reliability
- Increase in ore hardness is being addressed by the Incremental Expansion project
- Successful implementation of new community engagement

#### Centinela



- Operate plants at design capacity and optimise operations
- Paste thickener now operating reliably
- Start up and smooth integration of Encuentro Oxides and Moly projects

#### Antucoya



- Ramp up to full cathode production capacity achieved in 2016
- Operate plant at steady state and optimise operations
- Dust suppression solution fully implemented in primary crusher. On track to complete balance of plant by end of the year

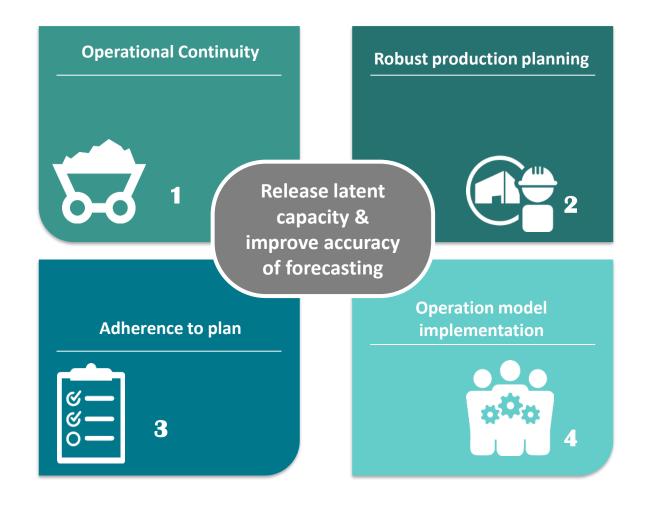
#### Zaldívar



- Successful integration now complete
- Continue to improve metallurgical recoveries
- Investment in upgrade of shovel fleet, bucket wheel and trucks
- Task force created to evaluate potential of primary sulphide

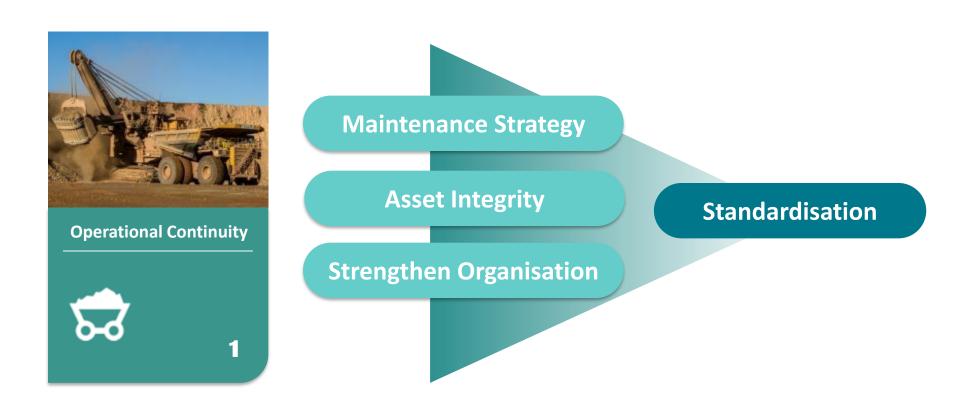
## **VPO Management Focus**





## **VPO Management Focus**





Improve operational reliability to release latent capacity

## **VPO Management Focus**





Geometalurgical predictive modelling

Close monitoring of KPI's

Value driver trees and other analytical tools

All decisions made by reviewing, analysing and scrutinising

### **VPO Management Focus**





Adherence to plan

**Early identification** 

**Achieve commitments** 

Compensation tied to performance against plan

### **VPO** management focus



#### **New Operating Model**



- To strengthen Production Planning Process
- To focus Operations on Safety, Production and Costs
- To elevate Maintenance as a Strategic Activity
- To establish Continuous Improvement from the line supported by Operational Excellence
- To strengthen **Sustaining Projects** function
- To establish processes for:
  - Operations Support Services
  - Asset Integrity
  - Engineering Standards

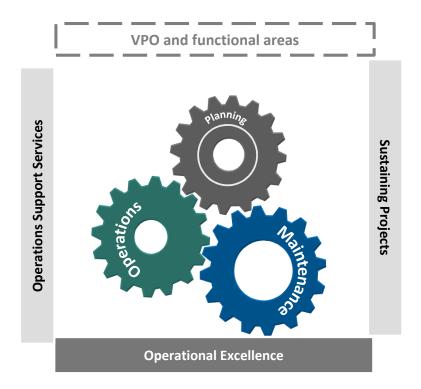


Operation model implementation



4

Objectives



### **Key Messages**



- Steady improvement in plant operating reliability at Los Pelambres
- Reliable operation of Centinela thickeners to allow the plant to run at name plate capacity of 105ktpd
- Having achieved full copper cathode capacity at Antucoya, focus now on operating plant at steady state
- Successful integration of Zaldívar complete with focus now on continuing to improve recoveries
- Implementation of New Operating Model

# **Projects**

December 5<sup>th</sup> 2016

Francisco Walther Corporate Projects Manager





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### Agenda





#### Overview



#### Positioned for Growth

#### **Strategic priorities:**

- Advance growth opportunities to preserve optionality
- Staged Process and disciplined Front End-Loading and decision making
- Obtain EIA and other long-lead permits in good time
- Improve competitive position by working on productivity, innovation, technology and optimising design criteria

#### Challenging execution and construction strategies:

- Optimise and adjust footprints, layouts, construction standards, to make them
   Fit For Purpose
- Greater involvement of Owner's Teams rather than EPCM structures
- Focus on project readiness, earlier involvement of Operations and efficient start-up process

### **Growth Opportunities**



Operation/Antucoya	Exec. /OXE	Exec./Moly	FS	/MLP Incr.	FS/ 2 <sup>nd</sup> DMC
2016	2017 20	018	2019	2	020+
	Project	Stage	Earliest Production Start-Up	Initial Capex (US \$ Bn)	Production (av.Kt Cu/yr)
OXE	Encuentro Oxides Centinela	Construction	2017	0,6	45
Moly	Molibdenum plant Centinela	Construction	2017	0,1	2,4 (1)
PDP	MLP Incremental Expansion	FS	2020	1,1	60
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TMM	Twin Metals	Scoping	2025+	0,9-1,2	70-80 (3)

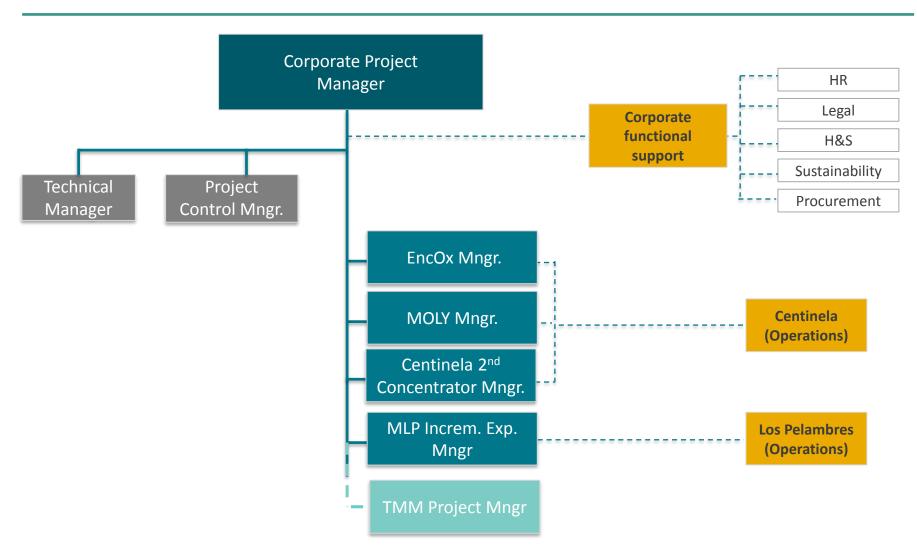
<sup>(1)</sup> kt fine Mo

<sup>(2)</sup> Cu eq (w/Au)

<sup>(3)</sup> Cu eq (w/Ni)

### **Projects Organisation & Functional Support**





### **Innovation & Competitiveness**



- Evaluating Roller Crushing technology v/s SAG. Allows Centinela better comminution and lower energy consumption and operating costs. Pilot plant for testing program running at site to ratify design and operational criteria.
- Optimisation of current competitive advantages based on new and proven technologies:
  - Continue usage of sea water at Centinela's operations (for concentrator and leaching) and Antucoya
  - Include desalinated sea water supply for Los Pelambres expansion
  - Thickened tailings to reduce water consumption and improve environmental control.
- Moly production to reduce Centinela's cash costs and improve returns.
- Flexible staged execution strategy so as to take advantage of market opportunities and to capture synergies with existing infrastructure and reduce construction risk.

### **Key Messages**



- Complete execution of the Encuentro Oxides and Moly Projects by 2017 and deliver to Operations
- Advancing Los Pelambres Incremental Expansion and Centinela Second Concentrator Projects (engineering, permits and further optimisation opportunities)
- Building the capability to execute the development projects in our two key mining districts



### Project Portfolio



### **Encuentro Oxides Project**



#### Location



#### Overview

- Open pit mine and heap leaching to produce PLS to fill the spare capacity of the SX-EW at Centinela Cathodes from 2017. Located 17 km South of Centinela's SX-EW.
- Higher grade ore crushed and leached on an on-off pad.
- Future low grade ore leached on a ROM pad.
- Potential life extension with further material from Encuentro and Polo Sur resources

Execution Phase *	Progress 75%	Owners	Antofagasta/Marubeni
Capex	\$636 million	LOM	8 years (+3 potential)
Production Start-up	2017	Ore leached	10 Mtonne/year
Production	45 ktCuF/year		

(\*) as October 2016



### **Moly Plant Project**



#### Location



#### Overview

- A highly automated Molybdenum Concentrate Plant, processing copper/moly/gold concentrate from Centinela.
- Includes: Thickener, flotation cells, concentrate filter, concentrate dryer, electrical room and a new water treatment plant.

Execution Phase *	Progress 50%	Owners	Antofagasta/ Marubeni
Capex	\$125 million	LOM	47 years
Production Start-up	2017	Mo Grade	0,6% Mo av. in Cu conc
Mo Production Avg.	2,4 Kt MoF/year		

(\*) as October 2016



### **Los Pelambres Incremental Expansion**



#### Location

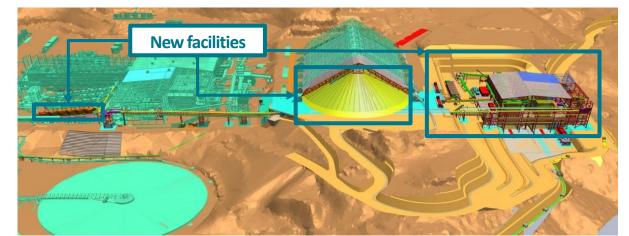


#### Overview

- Development in two phases, with separate environmental studies:
- Phase I (190ktpd): Complementary infrastructure consisting of a Desal Plant and a new grinding/concentrator line increasing copper production and competitiveness and compensating for the increase of ore hardness and potential water supply shortage. EIA for Phase I submitted to EIS Authorities in June 2016, evaluation currently underway.
- Phase II (205ktpd): Expansion and Life of Mine extension by increasing mine reserves, tailings dam storage and waste dump capacities beyond current design and permits.

Current stage *	Feasibility	Owners	Antofagasta, Nippon LPI, MM LP Holding
Initial Investment *	S1 1 hillion (PES)	Earliest Prodn start-up	Ph I: 2020
Cu production *	60 ktCuF/year	LOM	Ph I: 19 years Ph II: 30+ years

#### (\*) Phase I



#### **Centinela Second Concentrator**



#### Location



#### Overview

- New 90 ktpd concentrator fed from the Esperanza Sur mine. Design considers a future expansion to 150 ktpd adding the Encuentro Sulphides mine.
- New sea water pumping system and upgrade to existing Centinela infrastructure
- EIA submitted to EIS Authorities in May 2015, currently under evaluation and approval expected soon.
- Focus on reducing initial capex intensity and maximizing the value of the District, by integrating the new facilities into Minera Centinela

Current stage	Feasibility (initial)	Owners	Antofagasta/Marubeni
Initial Capex	\$2.7 billion (PFS)	LOM	30 years+
Earliest Production Startup	2021	Cu Production Potential (w/exp.)	150-160 ktCuEq*/year (+240 ktCuEq*/year)

(\*) CuEq w/ Au



#### **Twin Metals**



#### Location



The TMM Project is located in United States, northeastern Minnesota, approximately 10 miles from the town of Elv

#### Overview

- TMM's resources are within the Duluth Complex in northern Minnesota and represent the largest known undeveloped copper, nickel, gold and PGMs deposit in the world. Located adjacent to the long established Iron Range mining district.
- Project is currently considering a longhole stoping underground mine with cemented backfill and a concentrator plant with selective sequential flotation to produce separate copper and nickel concentrates, 25 year project duration and sufficient resources to extend mine life for another 50 years.

Current stage	Scoping	Owners	100% Antofagasta
Initial Capex	\$0.9 - 1.2 billion	LOM	~80 years
Production Startup	2025 +	Cu Production	40 ktCu/year 70-80 kt CuEq/year





December 5<sup>th</sup> 2016

Alfredo Atucha Group CFO



### **Key Messages**



Emphasis on profitable tonnes

Focus on cost and operational reliability

Positioned for growth

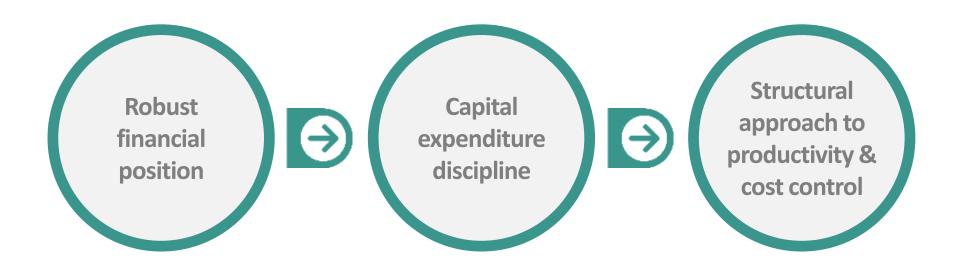
Creating long term value through Sustainability

Leaders in innovation

- Only profitable production
- Every tonne must make an earnings contribution
- Rebase costs
- Protect margins
- Planning and forecasting
- Advance organic growth projects for approval
- Robust balance sheet
- New community engagement model
- Social licence to operate or grow
- History of innovation
- Enables sustainability and lower costs
- Embedded practice

### Competitiveness as a key focus





### Competitiveness as a key focus



Robust financial position



Capital expenditure discipline



Structural approach to productivity & cost control

- Maintaining a solid balance sheet through the cycle
- Well prepared to finance growth pipeline

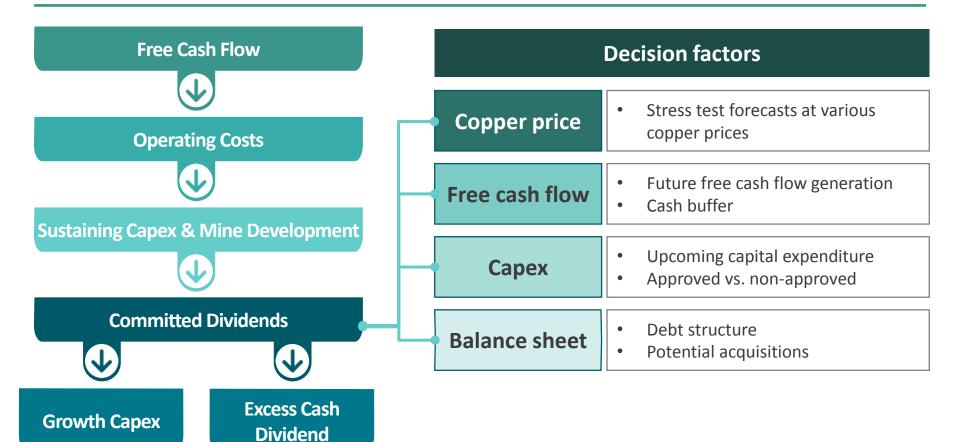
### Financial Strategy & Risk Management



- Strong partnerships to share project risk and to capture value up front
- Reserve of debt capacity to finance projects or acquisitions through the copper cycle
- Robust balance sheet which includes a cash buffer strategy to ensure liquidity and healthy debt management
- Flexible dividend with a minimum pay-out ratio of 35%
- Disciplined capital allocation policy and cost control programme
- Solid EBITDA margin

### **Capital allocation**

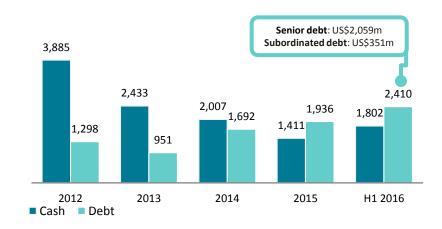




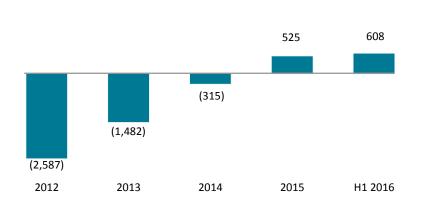
### **Robust financial position**



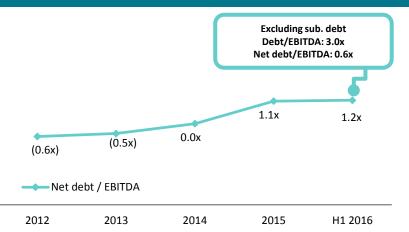
#### Cash and debt balance (US\$m) – Attributable basis



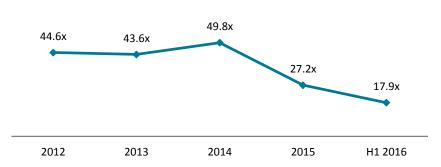
#### Net debt (US\$m) - Attributable basis



#### Net debt to EBITDA – 100% basis



#### EBITDA / Interest expense – 100% basis



Notes: Figures include subordinated debt

### Competitiveness as a key focus

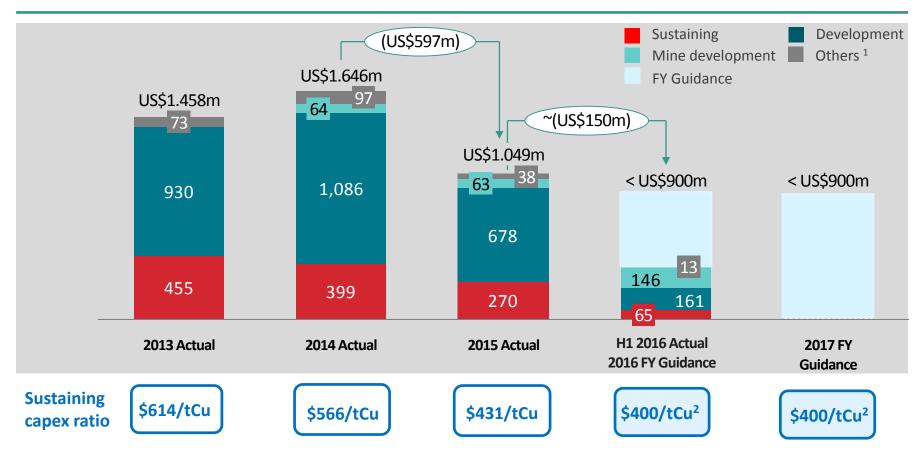


**Capital Robust financial** expenditure position discipline Ensure sustaining capex to maintain asset integrity Mine development for the long term Development projects compete for capital

Structural approach to productivity & cost control

### Capital expenditure discipline





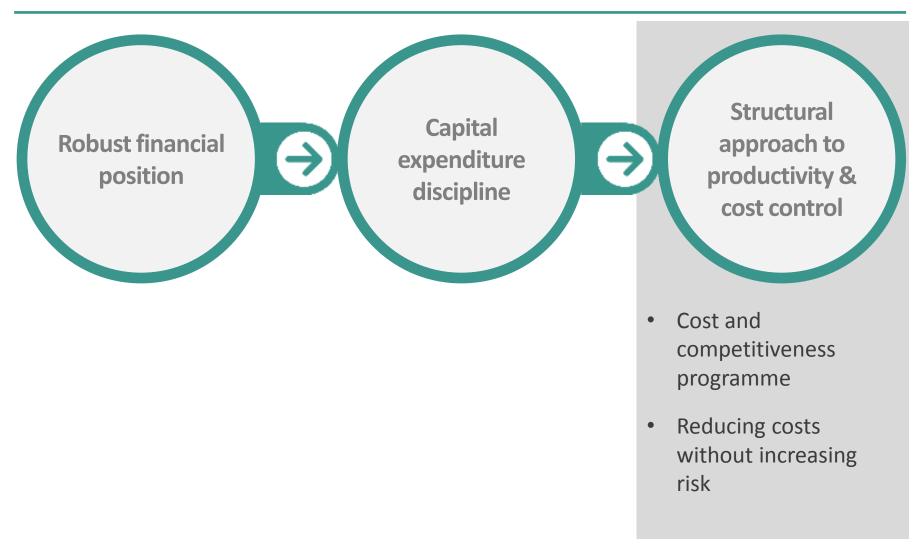
Improving sustaining capex ratio

Note: Figures are based on cash flow and exclude Zaldívar. Unaudited H1 2016 figures.

- 1. Transport Division, Water Division (until sale in June 2015) and Corporate
- 2. FY estimates

### Competitiveness as a key focus





#### Our framework





#### **Services Productivity**

Improving productivity and quality of contracts while reducing costs



#### **Operational & maintenance management**

Improving performance of critical processes and standardising maintenance management



#### **Corporate & Organisational Effectiveness**

Reducing corporate costs and restructuring corporate functions



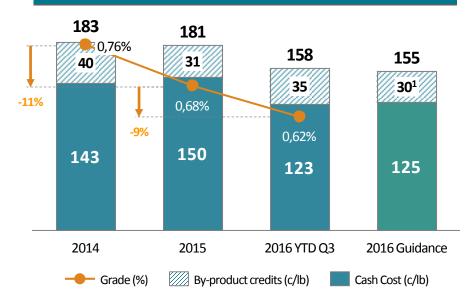
#### **Energy Efficiency**

Improving energy pricing and consumption efficiency

#### Cost base and breakdown

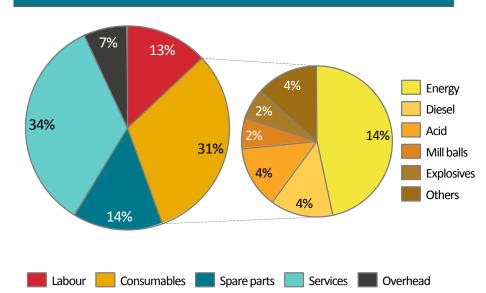


#### Group cash costs and copper grades evolution



- 2015 net cash costs increase 5% yoy despite 11% decrease in copper grades
- YTD Q3 2016 net cash costs decrease 18% despite a further 9% decrease in copper grades
- 2016 full year guidance for net cash cost is 125 c/lb, in line with ytd actual cost

#### Mining Group cost base breakdown by relevant item<sup>2</sup>



- Third party services account for 34% of cost base
- Consumables account for 31% of cost base, where Energy (electricity and fuel) represent 18% of cost base
- Labour accounts for 13% of cost base

 $<sup>^{1}\,\</sup>mathrm{By}\text{-product}$  credit guidance figure maintained from the beginning of the year

<sup>&</sup>lt;sup>2</sup> Figures based on YTD Q3 2016 actuals

### Highlights - 2015 and 2016



## Design and Guidelines

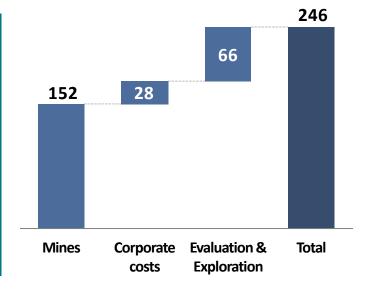
#### 2015

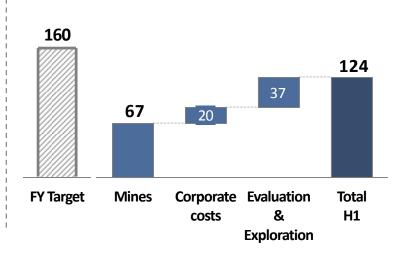
- Creation of the Cost and Competitiveness program, in response to the "new normal" economic environment
- Installation and deployment of the program throughout the Group

#### 2016

- Continuing and deepening the program, with specific goals for each operation
- Increased level of maturity, incorporating the program within the short and long term planning process

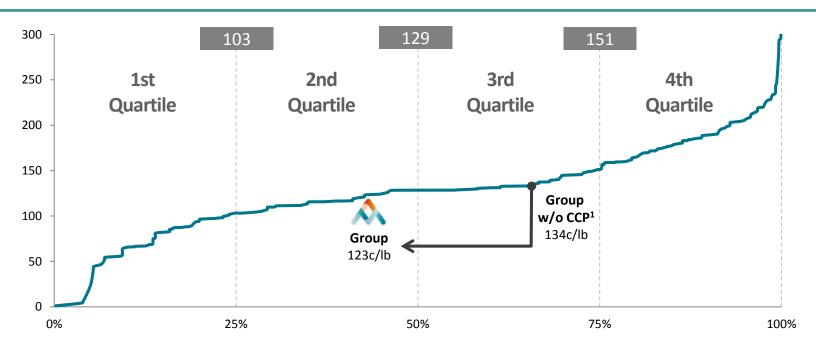






### **Cost competitiveness**



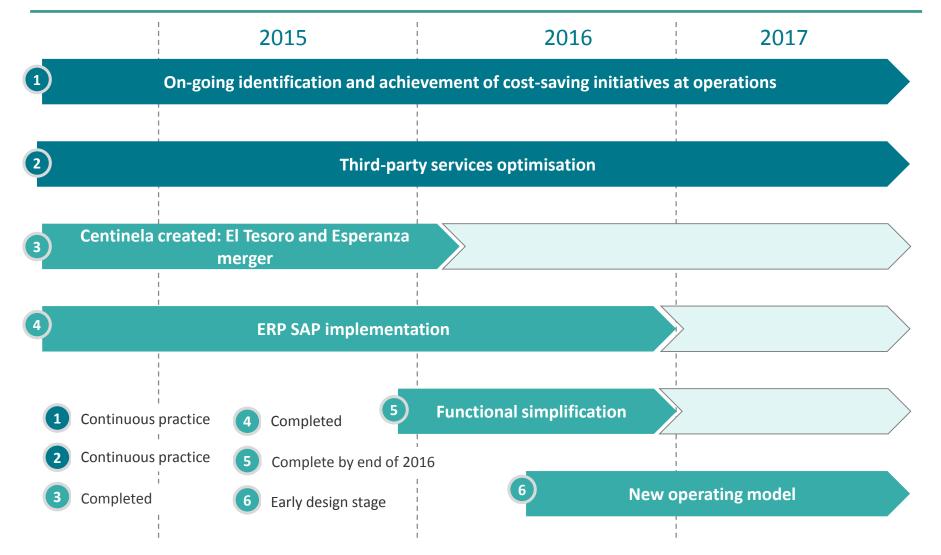


- Mining group positioned in the second quartile
- Cost savings identified and achieved during 2016 translate into 23% of percentile improvement for the Group (percentile 66% to 43%)

<sup>&</sup>lt;sup>1</sup> CCP: Cost and Competitiveness Program Cash costs quartiles from Wood Mackenzie Q3 benchmark report Group cash costs year to date September 2016

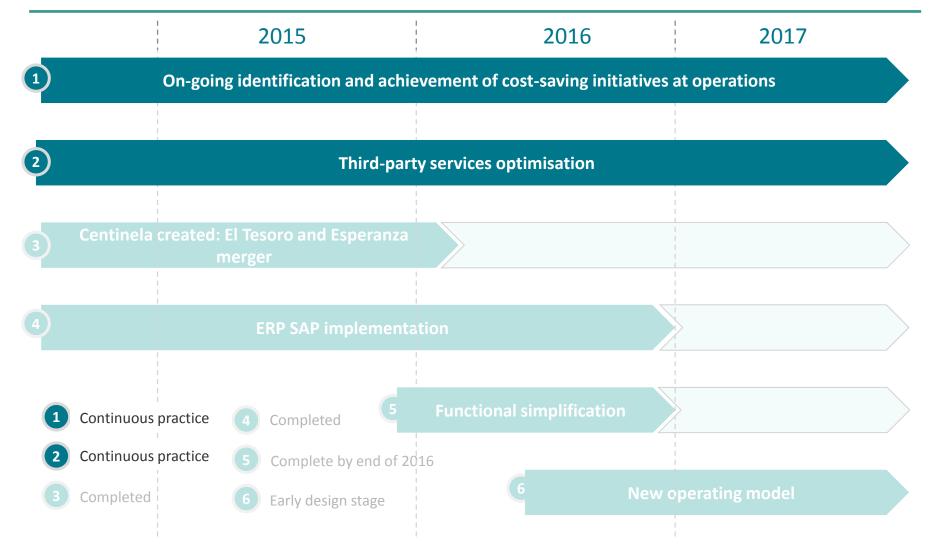
### Structural changes for sustainable savings





### Structural changes for sustainable savings





### Examples of cost-saving initiatives at companies

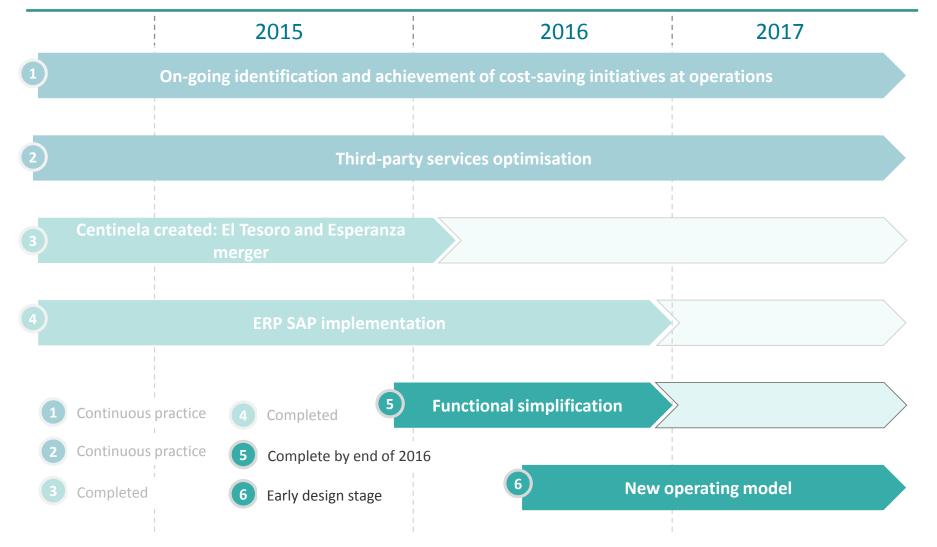


Savings initiatives on portfolio	Savings per initiative
<ul> <li>Used installed capacity to internalise the maintenance of an electric shovel</li> <li>Consolidation of concentrator plant mechanical maintenance contracts</li> <li>Reduction in power costs by applying control measures that modify peak consumption</li> </ul>	<us\$5 million/year</us\$5 
<ul> <li>Productivity improvement by changing contractor business model for mine equipment, with a 10% to 15% decrease in maintenance unit costs</li> </ul>	US\$5-10
Blasting mesh optimisation on waste fronts, which reduces consumption rate of explosives by approximately 10%	million/year
<ul> <li>Use of available loading capacity to replace rental shovel with a MARC maintenance contract</li> <li>Organisational structure optimisation</li> </ul>	US\$10-15 million/year

Savings portfolio contains more than 50 initiatives having a wide range of impacts

### Structural changes for sustainable savings





### Corporate initiatives



#### **Objectives**

- Standardise functional processes and foster best practice implementation and sharing
- Focus operations' teams on core business activities
- Improve the efficiency and effectiveness
- Reduce costs as a result.

#### **Changes**

- Aggregation of activities to avoid duplication
- Relocation of people & teams to where they add maximum value
- Optimisation of organisational structure

# New operating model

**Functional** 

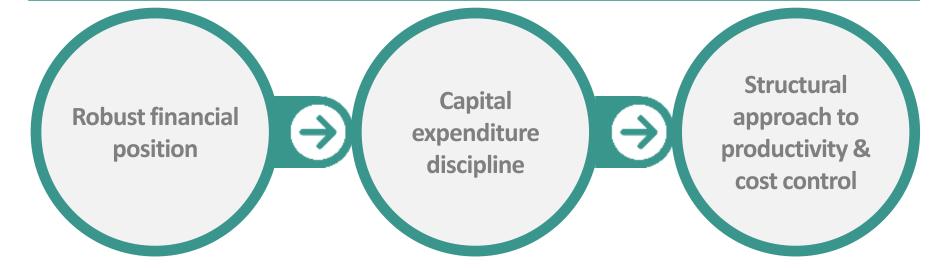
simplification

- Simplify operating processes
- Focus the lines on core business activities
- Strengthen operating discipline ensuring accountabilities are clearly defined
- Incorporate best practices for sustainable operations

- Strengthen planning and maintenance processes
- Implement operational excellence practice to foster continuous improvements
- Optimise organisational processes and structures

## Competitiveness as a key focus





- Maintaining a solid balance sheet through the cycle
- Well prepared to finance growth pipeline

- Ensure sustaining capex to maintain asset integrity
- Mine development for the long term
- Development projects compete for capital

- Cost and competitiveness programme
- Reducing costs without increasing risk



- Maintaining a solid balance sheet through the cycle leaves Antofagasta well placed to finance its growth pipeline
- Disciplined approach to capital investment ensures sustaining capex maintains asset integrity and assigns resources to best development capex
- Focus on structural changes that ensure savings are sustainable and give
   Antofagasta a competitive advantage

# **HR Strategy & Productivity**

December 5<sup>th</sup> 2016

Ana María Rabagliati Vice President – **Human Resources** 







Emphasis on profitable tonnes

Focus on cost and operational reliability

Positioned for growth

Creating long term value through Sustainability

Leaders in innovation

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## Agenda





## **HR Strategy**



#### **Pillars**

#### **HR Vision**

## HR Plan Productivity challenge

**Mining Group Culture** 

 Embedded Group culture, based on shared values, that leverages business strategy  Continue strengthening organisational culture, leadership competencies and desired behaviours

Safety and Innovation

Group Organisational Effectiveness

• Lean and effective organisation

Consolidate Functional Simplification Project

· Implement new Operating Model

**Talent Management** 

 Strong Group Talent pool, that ensures sustainable local and international business growth Effective Talent Management

Strengthen organisational capabilities & technical skills

Strengthen Staff Appraisal Process

Staff Engagement & Labour Relations

 A clear and attractive Employee Value Proposition that makes us a preferred employer in the mining industry

- Strengthen Employee Value Proposition
- Maintain high staff engagement levels.
   Currently within top employers in Latin America mining industry (\*)
- Effective collective agreements negotiations

(\*) Aon Hewitt Engagement Study

### **Organisational Effectiveness**



#### **Areas of focus**



#### 2015 restructuring & headcount optimisation

- 7.5% headcount reduction
- 2016 Functional Simplification
  - Standardized functional processes and implemented best practice
  - Focused operations' teams on core business activities
  - Improved efficiency and de-layered organisation
  - Functional excellence
  - 18% reduction in Supervisors headcount functional areas

#### 2017 – Implement new Operating Model

- Simplify operating processes, reducing organisational layers
- Focus lines on core business activities: Operations, Planning, Maintenance and Operational Excellence
- Strengthen operating discipline to ensure clearly defined accountabilities

#### Strengthen leadership competencies & technical skills

Reinforce training programmes & talent upgrade

### **Antofagasta's Labour Relations**

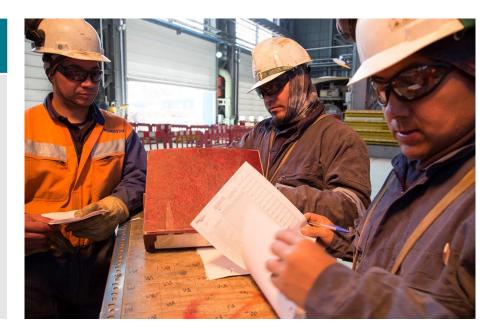


- Strong history of good labour relations with own employees & contractors
- 2016:
  - Three Collective Agreements achieved within expected costs and without strikes [ZAL supervisors MLP supervisors - ANT workers]
  - Los Pelambres federation of contractors unions reached a labour agreement with their respective companies, without operational interruptions

#### **Areas of focus**



- 2017 collective negotiations [Centinela Supervisors, Zaldívar and Los Pelambres workers]
- Ensure legal compliance according to new labour legislation
- Ensure alignment of contractors standards to Group's strategy, going beyond industry standards
- Strong Employee Value Proposition to attract and retain talent





HR strategy aligned to business objectives and challenges, that assures organisational capabilities for growth

- History of strong labour relations
- Focus on improved efficiency through organisational effectiveness projects
- Upskilling talent with a long term view
- Promoting a performance focused organisational culture
- Improving labour productivity is an opportunity in Chile and for Antofagasta

## Social & Environmental **Sustainability**

December 5<sup>th</sup> 2016

#### Francisco Veloso

Vice President – Corporate Affairs & Sustainability







Emphasis on profitable tonnes

Focus on cost and operational reliability

Positioned for growth

Creating long term value through Sustainability

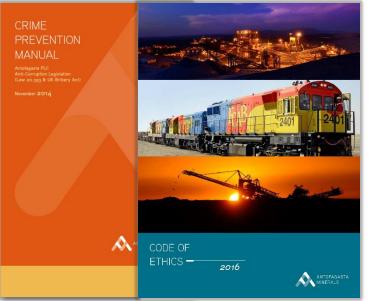
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#### **Corporate Governance**







- The Board is responsible for the sustainability strategy of Antofagasta.
- The Company has five Board committees: Audit and Risk; Projects; Nomination and Governance; Remuneration and Talent Management; Sustainability and Stakeholder Management.
- The CEO leads the administration of corporate governance, assisted by an Ethics Committee; Politically Exposed Persons Committee and a Crisis Committee.
- An Internal Regulation Model has been implemented which includes a Charter of Values and a Code of Ethics, together with policies, standards, guidelines and procedures.
- All processes are subject to audit by an internal audit team that report to the Audit and Risk Committee.

#### **Engagement Process**







- Stakeholder engagement process being implemented at all of the Group's operations.
- Engagement process requires the participation of the company, authorities and communities.
- Principles of the engagement process are:
   Dialogue, Transparency, Collaboration, Traceability and Excellence, to ensure sustainability is integrated into the business.
- New engagement process was initiated at Los Pelambres.
- Engagement process has led to a reduction of tensions in the region.
- The process includes a performance measurement framework, which includes well-being indicators.

## **Caimanes Agreement**







- Using the engagement process principles, an agreement was reached to resolve the legal and social conflict with the local Caimanes community.
- Over 18 open-invitation assemblies were held with opponents, lawyers, community-leaders and residents, along with the Chilean branch of Transparency International.
- Agreement on water, safety, family programs and community development signed by 84% of the community.
- Minimises risks that could impact the current operation and enables Los Pelambres and El Mauro tailings dam to grow.

#### **Environment**







- Mining group has 54 different environmental permits and over 4,000 commitments.
- Internal audits are conducted to identify highpotential risks and carry out compliance plans.
- Environmental authority (SMA) charges against Los
   Pelambres regarding environmental permits issued in 2004.
- Los Pelambres proposed to the environmental authority a plan to comply with identified charges
- Los Pelambres is fully committed to environmental compliance

#### **Water Issues**







- Antofagasta's operations use both sea water and continental water.
- Centinela's sulphide plant and Antucoya use 100% sea water.
- The oxide plants at Centinela and Zaldívar use continental water (from wells).
- Los Pelambres consumes water from continental sources. This corresponds to approximately 5-8% of the total available in the Choapa valley basin.
- Los Pelambres, the community and authorities have agreed that any future operational expansions will utilise sea water.
- In May 2016, Los Pelambres submitted an Environmental Assessment Study to advance a 400l/s desalination plant as part of the Incremental Expansion Project



- Antofagasta has effective Corporate Governance to ensure our sustainability performance
- A new process to develop our engagement with surrounding communities is being applied to all our operations
- The agreements reached with Los Pelambres's communities ensure the continuous operation of the mine and enable growth
- Always seeking to strengthen environmental monitoring processes to ensure compliance with changing expectations
- Antofagasta is increasing the use of sea water, and mitigating the risk of water shortages, and regulatory and community concerns

## **Energy Management**

December 5<sup>th</sup> 2016

Anna Gretchina Head of Energy







Emphasis on profitable tonnes

Focus on cost and operational reliability

Positioned for growth

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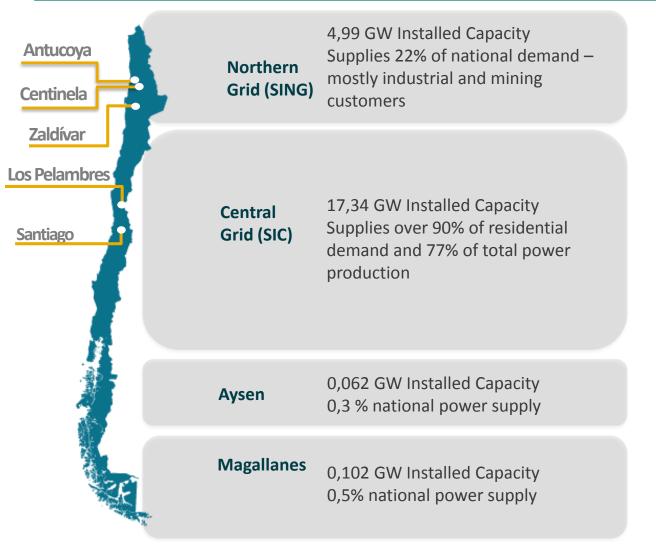


## Power Market Overview



### **Chilean Electric System**





#### **Grids Interconnection**

- SIC SING interconnection completion expected in early 2018
- New national grid will supply 99% of national demand and increase customers' access to a wide range of power generation sources



## **Power Market Highlights**



#### Supply



Important decrease of renewable generation development and construction costs

- 2,9 GW under construction (84% renewable) (1)
- **40,0 GW** with granted environmental approval (**69%** renewable) (1)
- **13,5 GW** submitted for environmental approval (**64%** renewable) (1)

#### **Transmission**



Transmission related risks reduced for power generators

New transmission law enacted in July 2016:

- Grants open access to all transmission lines
- Provides framework for system planning and development ahead of supply/demand growth

#### **Price**



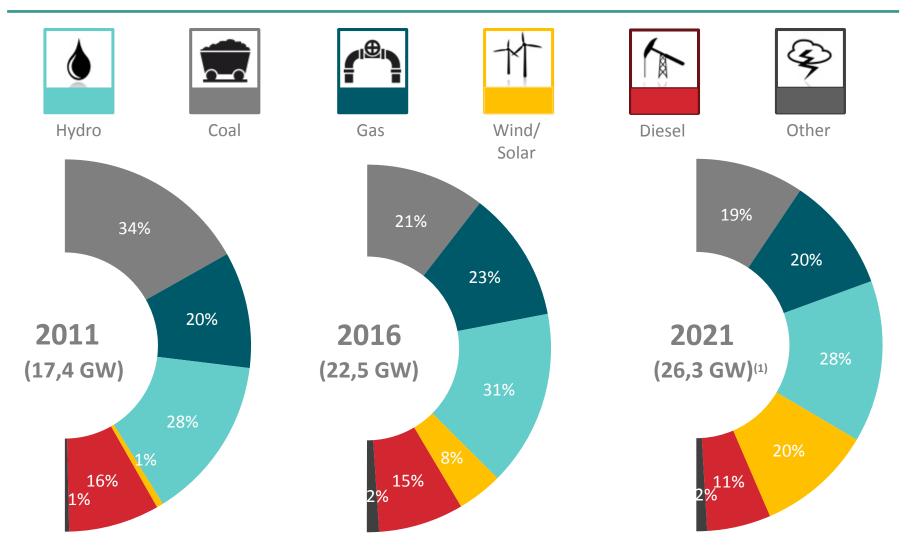
- **↓ 36** % SIC spot price compared to 2015<sup>(2)</sup>
- **↓ 6 % SING** spot price compared to 2015<sup>(2)</sup>
- **↓ to 47,5 USD/MWh average** energy price for the distribution companies' tender process for supply from 2021 onwards (108USD/MWh average awarded price for an equivalent amount of power in 2014)

<sup>(1)</sup> October 2016

<sup>(2)</sup> January – October

## **Power Supply Matrix**







## Power Supply Management



## Long term Supply Strategy - Security of Supply



# Focus on security of supply at competitive costs

- Long term supply secured for all operations
- Diversified supply matrix
- Fuel indexed contracts reflecting the commodities cycle
- Focus on continuing to optimise current price structure

# Growth opportunities to benefit from competitive supply

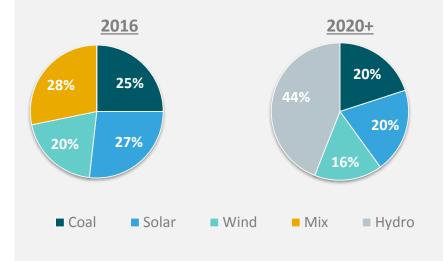
- Well positioned to take advantage of new market conditions
- Focus on secure, cost efficient, competitive and sustainable supply

## **Antofagasta's Power Supply Structure**



#### **Los Pelambres**

- Diversified supply mix secured for the long term
- By the end of 2016, 47% of Los Pelambres's PPAs will be with renewable generators
- 2019 onwards 80% of power will come from renewable sources



#### **Northern Operations**

- Long term supply secured with fuel indexed price structure
- PPA expiry dates:
  - 2020 Zaldívar
  - 2026 Centinela
  - 2028 Antucoya





## Power Demand Management



### **Energy Efficiency Program**





#### **Operational and process optimisation**

- Process control and optimisation strategies at all operations to reduce energy consumption and cost
- Best operating practices and operational excellence



#### **Technological optimisation**

- Looking for more efficient and cost competitive technologies to reduce energy consumption
- Aligned with the innovation program



#### Fuel and power sources replacement

 Replacement of energy sources with the most economical and sustainable alternatives in the long run (renewable energy & LNG)



#### **Integrated energy management**

- Control, measurement and reporting system across Group's operations
- Integrating opportunities to capture and prioritise methodology, securing a portfolio of initiatives to make an effective impact on the Group's cost structure



- Long term, reliable and diversified supply has been secured for all of the Group's operations
- Continuous cost savings are coming from price control and demand optimisation
- Energy efficiency program and a methodical and disciplined approach create opportunities to capture value

# Innovation

December 5<sup>th</sup> 2016

Alan Muchnik Growth Assets, Energy & Innovation Manager







Emphasis on profitable tonnes

Focus on cost and operational reliability

Positioned for growth

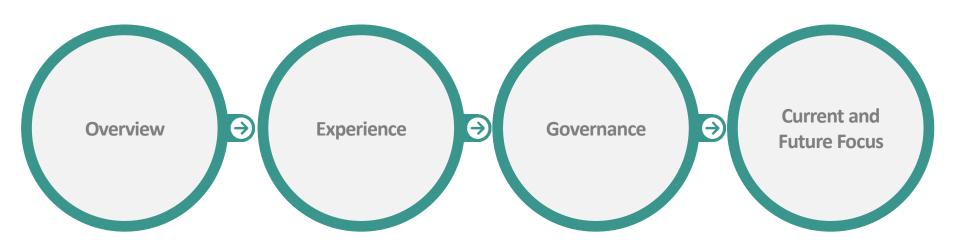
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# Innovation is a key enabler for greater sustainability, lower costs and more profitable tonnes



• True innovation is expected to support productivity gains and financial growth

Antofagasta is well-placed to take advantage of innovation as a key enabler of long term value creation

- We recognise and promote new ideas that improve the way we work and the way we relate to others, so as to create value for the company, people and society at large
- Creating an environment in which innovation thrives, enabled by our culture

## Antofagasta draws on a history of successes



#### The Michilla Legacy

- In the early 90s Michilla became the first mining company in the country to use 100% sea water for all its operational needs
- Developed and implemented Cuprochlor process in 2001
- Pilot test plant is used as a leaching "lab" to support the operations and is a key facility used by the Group

#### Cuprochlor



- Hydrometallurgical technology for leaching sulphide ores
- Based on chemical additives
- Uses raw sea water
- Good mechanical strength of the heap
- Achieved competitive recoveries at or below 120 days leaching cycles at Michilla
- Considering applying same principles at Zaldívar





#### Innovation is a permanent practice



- ✓ Somos Choapa, a networking model with key stakeholders at Los Pelambres to strengthen participation and build a common vision for the future
- ✓ Almost 50% of Los Pelambres's energy supplied from clean and renewable sources expected to increase to 80% by 2020.
- ✓ Large scale use of thickened tailings at Centinela
- ✓ Centinela and Antucoya only use raw sea water in their industrial processes
- ✓ Flexible execution strategy, with larger owner's project team (vs EPCM contractor) for Encuentro Oxides and Moly projects to improve control and decrease costs





High Performance Teams Program HRC Test Fatigue control system
Predictive model particulate material Thickened tailings
IT Monitoring center, CCTI Robotic cathodes polisher
Sea water floatation Belt power generation SFR floatation cell test

Digital samples mapping Cuprochlor-T Thermal plant Virtual Security Training Quillayes Bio-remediation Pump optimization El Mauro

Metal tooth monitoring system

Low grade and sea water heap leach process

# We are applying a systematic approach to managing innovation



- A business imperative and function with a clear governance across Antofagasta
- Expected to impact on the following dimensions: safety, technical, organisational, relational and/or our business model; with efforts focused on identified key areas of interest

#### ✓ Structure

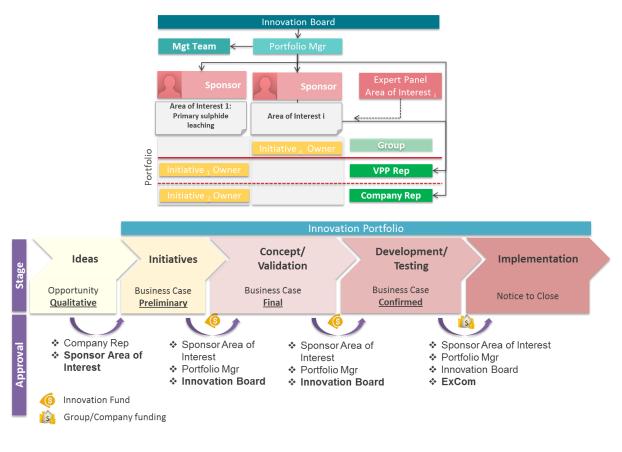
- Matrix management of a portfolio of initiatives under an annual Innovation Fund
- With an Innovation Board that oversees the portfolio

#### Process

 To move from ideas to implemented initiatives based on their business case

#### ✓ System

To capture ideas and manage the initiatives



# We will continue using our ability and experience to find innovative solutions



#### **Key areas of interest to Antofagasta:**

- Primary sulphide ore leaching
- Tailings management and emplacement
- Material movement
- Social contribution to communities
- Energy efficiency and renewable energy use
- Automation and robotics









- Innovation is a key enabler for greater sustainability, lower costs and more profitable tonnes
- We are applying a systematic approach to managing innovation
- We will continue using our ability and experience to find innovative solutions



December 5<sup>th</sup> 2016

Iván Arriagada **Chief Executive Officer** 



