



ANTOFAGASTA MINERALS

## SUSTAINABILITY REPORT 2016



Antofagasta Minerals is the leading non state mining group and third largest copper producer in Chile, eighth largest in the world. We aim to be recognised as a highly profitable copper mining company, creating economic, environmental and social value.

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# LETTER FROM THE CEO

Iván Arriagada

Antofagasta Minerals has grown from a medium-sized mining operation to one of the leading copper producers in the world, with four operations in Chile, and development projects and exploration sites in Chile and elsewhere around the globe.

This rapid growth has been guided by the values and principles which characterise this Group and, in particular, the safety and wellbeing of our employees. For this reason, although the rate of accidents has continued to fall and we have made significant progress in the implementation of our safety and health management model, we are deeply saddened by the death of Franco Torrejón, an employee who lost his life in an accident at Antucoya in 2016. We send our heartfelt sympathies to his family and friends and assure them that we will double the efforts we are making to fully implement the safety and health model, and to eradicate fatal accidents from all of our operations.

This is no simple task, since it is not just a question of implementing a rigid set of systems, standards and controls. Due to the nature of mining, we must also shape the culture of our organisation so that safety becomes part of our everyday life and is always

considered the most important goal. Various indicators show that we are on the right track and we will not give up on our objective of zero fatal accidents.

Our business strategy is focused on strengthening our core business –our copper operations in Chile– and using this as a platform to develop our options for growth. As a result of this strategic clarity, we are now better prepared to face this difficult time for mining across the world and our financial results in 2016 show that we were able to reduce costs and increase production. This, in turn, helped us to again make a profit and confirmed our ability to continue growing.

Our Cost and Competitiveness Programme achieved US\$170 million in savings during 2016. Thanks to the collaboration of all of the Group’s operations, we managed to surpass the goal we had set for ourselves, through the more than 110 initiatives different work teams identified.

Today we are more efficient and productive, but have set ourselves new targets for 2017, because we believe striving for greater competitiveness is a permanent challenge that has to be achieved every year. This does not end when prices recover.

We have achieved all of this without compromising our development opportunities. During 2016, Antucoya reached its design capacity and we completed the integration of Zaldívar into the Group, which together accounted for a significant part of the 12.5% increase in production. Likewise, we made significant progress in the expansion projects at both Centinela and Los Pelambres.

Our strategic vision places sustainability at the heart of our decision making. The mining industry must earn its right to exist every day, especially when there are communities near its operations. In 2016 we examined our community engagement process in depth, focusing on dialogue, collaboration, transparency, excellence and traceability - principles we have applied since 2014 through the Somos Choapa programme.

This approach has helped us to reach a historic agreement with the residents of Caimanes, resolving 10 years of conflict and litigation over the Mauro tailings dam. We are confident that this agreement paves the way for a new relationship, characterised by willingness to collaborate and grow together.

We are also exploring new ways of dealing with environmental challenges to ensure that we meet each one of our commitments and follow the best practices in the industry. In 2016 we made progress on three new standards aligned with sustainable mining: climate change, biodiversity and integrated mine closure.

The progress made in 2016 has only been possible thanks to the commitment of our employees and the trust of our stakeholders. I would like to thank everyone who works at our operations, and in our exploration and development projects. Through their abilities and drive we will become a benchmark for the future of mining.

Iván Arriagada  
CEO  
Antofagasta plc



# INTERVIEW WITH THE CHAIRWOMAN<sup>1</sup> OF THE SUSTAINABILITY AND STAKEHOLDER MANAGEMENT COMMITTEE

**Vivianne Blanlot**

**Q How does the Board of Directors contribute to the Group's sustainable development?**

The Board is taking an ever greater interest in social, environmental and safety issues. I believe that nowadays the Committee is devoting more time and attention to the analysis of sustainability issues than in the past, because these issues are of great strategic importance, are extremely varied and relatively new. Failing to manage these issues correctly would put our business at risk.

**Q What were the Committee's priorities in 2016?**

Our top priority continues to be people's safety. We have yet to eradicate the loss of life due to accidents at our operations. We will continue to focus on improving the safety strategy, procedures and culture until we achieve and consolidate our objective of zero fatal accidents.

Another focus has been ensuring full compliance with all of our environmental commitments and, to this end, it is vital we improve our management and audit processes.

A key concern of the Board in 2016 was to ensure that the social and environmental issues at Los Pelambres were properly resolved. This Committee was updated periodically on the progress of Somos Choapa, as well as the process that resulted in the Caimanes Agreement, which enabled the company to resolve a conflict that had been dragging on for over a decade.

**Q Which factors made it possible to achieve the historic agreement with the Caimanes community?**

The key was getting to the root of the problem – concerns regarding water, the safety of the dam, and community development – and to work together with the community, using the same principles of the Somos Choapa process. In this model, the company operates as a stakeholder in the territory rather than as an external entity dispensing benefits such as compensation for environmental effects, as is often the case in this and other industries.

I cannot think of any other comparable project in Chile with these levels of engagement

and dialogue for addressing such a serious problem as the one at Caimanes, which brings together so many productive, environmental, social, and cultural variables.

The focus and methodology were key. We also benefited from a highly-qualified and dedicated team that is convinced that this is the right and fair way to deal with the community.

**Q What will be your focus in 2017?**

We must of course continue to focus on people's safety. The other big challenge is to improve the timeliness and quality of environmental compliance. To this end, management has defined three areas to work on. First, to develop an environmental management model that is as robust as the safety model and to continue to improve and standardise environmental norms and criteria at all of our operations. Second, to drive cultural change with regard to environmental management and to increase awareness of the environmental impact of operating decisions and the importance of full and timely

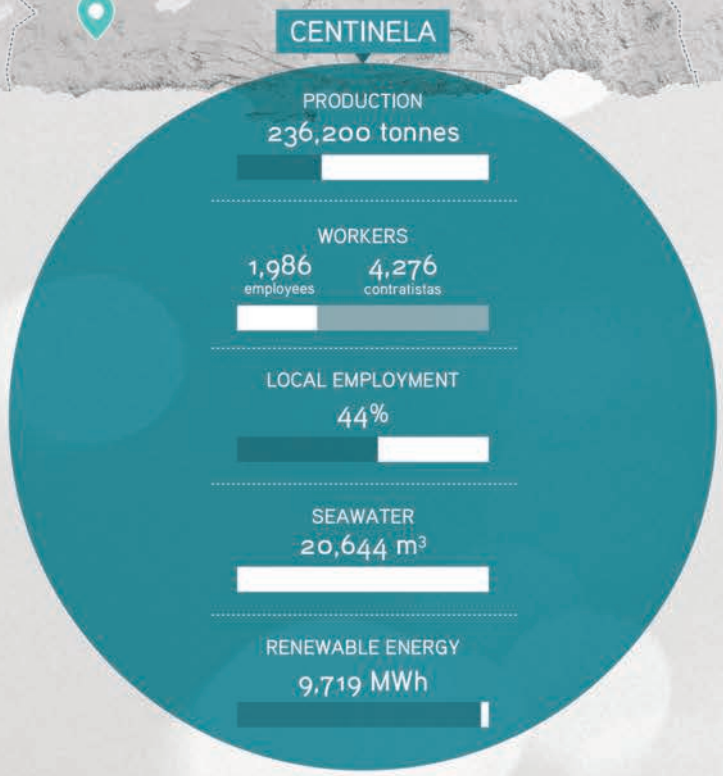
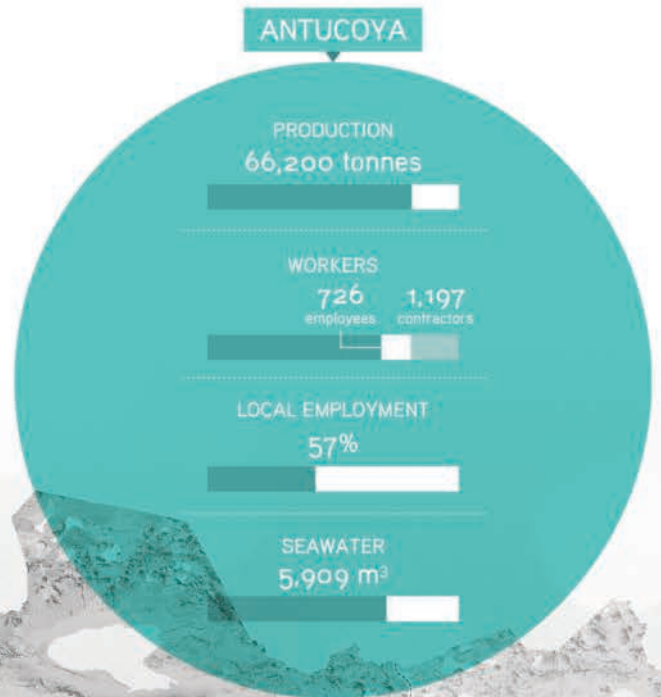
compliance with environmental commitments. Third, to rationalise future commitments and to do this it is vital to work with the environmental authorities to agree on relevant and feasible commitments, and to fully comply with them.

As an ever-growing Group, we will face new social and environmental challenges. The lessons learned in the Somos Choapa process were used effectively at Los Pelambres, but this is not a template that can simply be replicated. Future issues will need their own solutions to be resolved and will require plenty of dialogue and flexibility.

<sup>1</sup> Member of the Committee since March 2014. Took over as Chairwoman in January 2017.

# OUR OPERATIONS

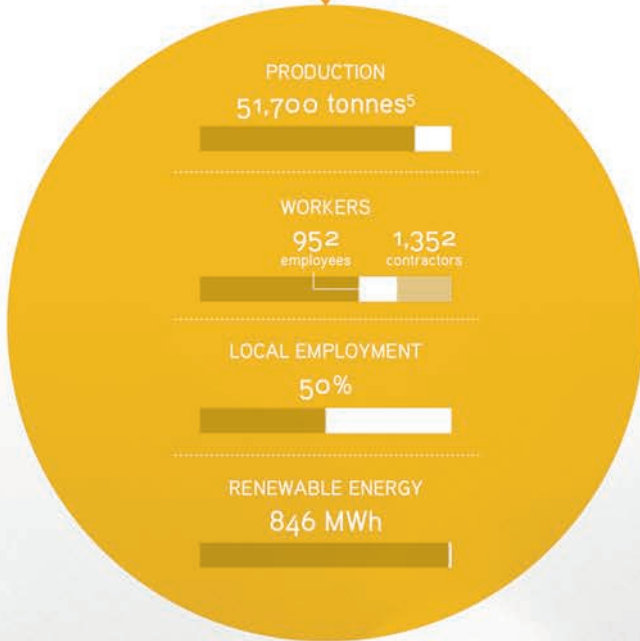
As the leading non-state mining group in Chile and one of the ten largest copper producers in the world, excellence is our hallmark. We have the best professionals in the industry and together we contribute to the future of mining.



1 Average number of employees employed at the operations and Corporate Centre on full-time and fixed-term contracts.  
2 Average number of employees at the operations and Corporate Centre working as contractors.

For more information on the products, markets, processes and figures for the business, visit [www.aminerals.cl/mineria-quienes-somos/que-hacemos/](http://www.aminerals.cl/mineria-quienes-somos/que-hacemos/) and the Annual Report 2016 Antofagasta plc, available at [www.antofagasta.co.uk](http://www.antofagasta.co.uk)

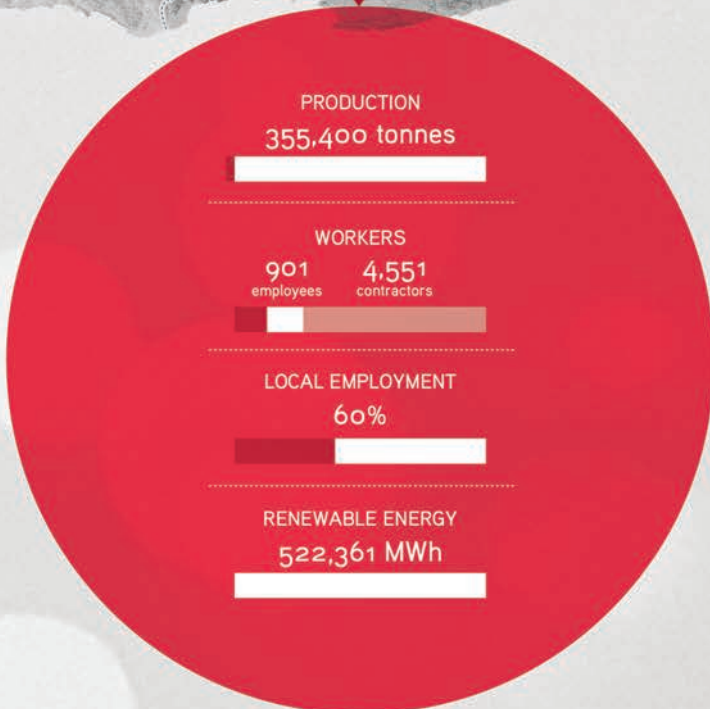
ZALDÍVAR



III REGION DE ATACAMA

IV REGION DE COQUIMBO

LOS PELAMBRES



ABOUT US

Antofagasta Minerals is a Chilean group dedicated to copper mining, with a significant production of gold, molybdenum and silver as by-products. It is part of Antofagasta plc, which is listed on the London Stock Exchange and is a constituent of the FTSE 100 and the FTSE4Good<sup>3</sup> indexes. Some 65% of the shares are held by entities in which members of the Luksic family have an interest.

In 2016, the mining division generated 96% of Antofagasta plc's revenue.

The Group creates value for its shareholders and stakeholders by identifying, developing and operating copper mining assets. It has four mining operations: Los Pelambres, Centinela, Antucoya and Zaldívar. In the case of Zaldívar, Antofagasta Minerals acquired a 50% interest from Barrick Gold Corporation in December 2015 when it also became its operator.

In addition, it has a significant portfolio of growth opportunities with projects located mainly in Chile and the United States.

Until January 2017, Los Pelambres owned a 40% interest in the Alto Maipo hydroelectric project. Its entire interest was then sold to AES Gener.

In December 2015, Antofagasta Minerals ceased operations at Michilla and in November 2016, it was sold to Haldeman Mining Company

Products

Copper concentrate and cathodes, in addition to the by-products gold, molybdenum and silver.

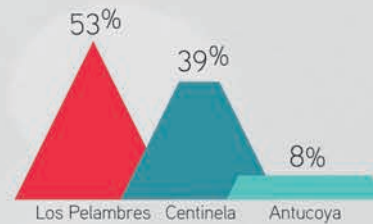
EBITDA (2016)

US\$ 1,538.4 million

Revenue (2016)<sup>4</sup>

US\$ 3,461.5 million

By company:



By product:



<sup>3</sup> London Stock Exchange sustainability index series.

<sup>4</sup> Zaldívar not included, according to IFRS 10 (International Financing Reporting Standards) for Consolidated Financial Statements.

<sup>5</sup> 50% of Zaldívar's total production.

# OVERVIEW OF OUR OPERATIONS

## LOCATION



### LOS PELAMBRES

Coquimbo Region, Choapa Province. The mine is in the community of Salamanca and its port is in the municipality of Los Vilos.

### CENTINELA

Antofagasta Region, 21 km from the town of Sierra Gorda. It has a port at Michilla cove, in the municipality of Mejillones.

### ANTUCOYA

Antofagasta Region, on the border between the municipalities of María Elena and Mejillones, 125 km north-east of the city of Antofagasta.

### ZALDÍVAR

Antofagasta Region, 175 km south-east of the city of Antofagasta.

## CHARACTERISTICS



### LOS PELAMBRES

Sulphide deposit that produces copper concentrates, containing gold and a molybdenum concentrate, through a milling and floatation process. The copper concentrates are transported through a 120 km underground pipeline to the port of Los Vilos.

### CENTINELA

Centinela was formed in 2014 from the merger of the Esperanza and El Tesoro mines. It has sulphide and oxide deposits. It produces a copper concentrate containing gold and silver, through a floatation process and copper cathodes using solvent extraction and electrowinning (SX-EW). The concentrate is transported through an underground pipeline to the port. Cathodes are transported in trucks to the port of Antofagasta.

### ANTUCOYA

Oxide deposit. Construction was completed in 2015. It produces copper cathodes through solvent extraction and electrowinning (SX-EW), which are transported in trucks to the port of Antofagasta.

### ZALDÍVAR

Oxide deposit. It produces copper cathodes through solvent extraction and electrowinning (SX-EW). Cathodes are transported by rail to the port of Antofagasta.

## ECONOMIC CONTEXT



## ANTOFAGASTA MINERALS

Produces 13% of Chile's copper output.

LOS PELAMBRES'S sales represented 61% of the exports from the Coquimbo Region. The value added generated by mining amounts to 12% of the Region's GDP.<sup>1</sup>

CENTINELA AND ANTUCOYA together accounted for 9% of exports from the Antofagasta Region.<sup>2</sup>

1 2015 data.

2 Excluding Zaldívar, which is not consolidated under IFRS accounting standards.

## SOCIO-ENVIRONMENTAL CONTEXT



## COQUIMBO REGION

## LOS PELAMBRES

The company operates in the Choapa valley. Traditionally, the valley has been a farming, cattle and mining area, with a Mediterranean climate.

The Los Pelambres mine is high in the valley in an area with a high desert climate. The Province of Choapa has 84,000 inhabitants.

## ANTOFAGASTA REGION

CENTINELA, ANTUCOYA AND ZALDIVAR are located in the Atacama Desert, one of the most arid deserts in the world, with very little flora and fauna, and no communities in the immediate surrounding areas.

## CENTINELA

Sierra Gorda is the closest populated area, located around 30 km from the mine. It has almost 3,900 inhabitants, whose main employment is providing mining services.

## ANTUCOYA

The deposit is located at 40 km from the old mining town of María Elena, which has 7,400 inhabitants.

## ZALDIVAR

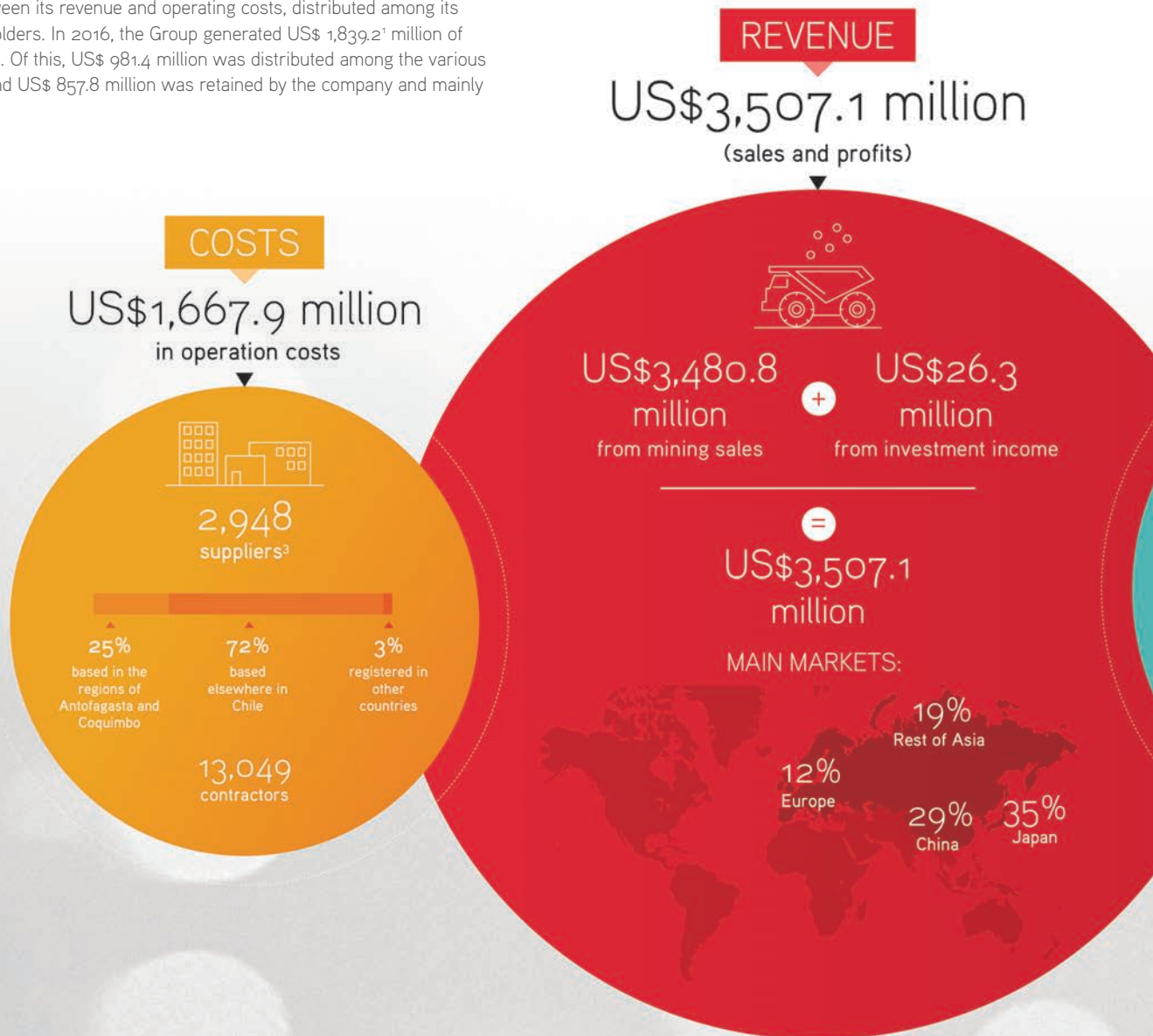
The closest community is 100 km from the mine and is part of the Antofagasta commune, which has 379,000 inhabitants.



# DISTRIBUTION OF GENERATED VALUE

We began in Antofagasta, northern Chile, and our history shows that it is possible to generate value for our shareholders, employees, the government and the communities living in our surrounding areas.

We measure the economic value generated by Antofagasta Minerals as the difference between its revenue and operating costs, distributed among its various stakeholders. In 2016, the Group generated US\$ 1,839.2<sup>1</sup> million of economic value. Of this, US\$ 981.4 million was distributed among the various stakeholders and US\$ 857.8 million was retained by the company and mainly reinvested.<sup>2</sup>



1 This corresponds to the difference between the revenue and the operational costs and does not include Zaldívar.  
 2 In 2015 the Group generated US\$ 1,233.9 million of economic value. It distributed US\$ 713.6 million and retained US\$ 520.3 million.  
 3 This includes suppliers for Los Pelambres, Centinela, Antucoya and Zaldívar.  
 4 Includes Fundación Minera Los Pelambres. Does not include Zaldívar.

**GENERATED ECONOMIC VALUE**

US\$1,839.2 million

US\$981.4 million  
Distributed value



US\$857.8 million  
Retained value



US\$1,839.2 million



COMMUNITY

US\$24.3 million

contributed to community projects<sup>4</sup>



GOVERNMENT

US\$243.3 million  
in taxes

85%  
corporate tax  
15%  
royalty tax



EMPLOYEES

US\$339.6 million  
on wages and benefits

9%  
women

US\$1.5 million  
invested in training

4,977  
direct employees  
(own workers)



SHAREHOLDERS AND LENDERS

US\$290.6 million  
distributed as dividends

US\$83.6 million  
interest paid to lenders

# BUSINESS STRATEGY

Our goal is to generate value for our shareholders and stakeholders. Sustainable development is an integral component of the decision-making process at Antofagasta Minerals and is embedded in its business model and strategy.

## VISION

We want to be known not just as an international mining company based in Chile, focused on copper and related by-products, but for our outstanding operating efficiency, creating value, high profitability, and for being a preferred partner in the global mining industry

We want to stand out for:

- ▶ Our exceptional performance in safety and health, and for our sustainable policies regarding the environment and our communities.
- ▶ Our highly-productive exploration programme, which has created a strong resource and reserves base to facilitate the possible development of new deposits.
- ▶ Our four efficient Chilean operations, as well as a project under development outside Chile, which can together produce over 700,000 tonnes of copper per year.
- ▶ Our culture of excellence and for fulfilling our operating commitments, development commitments and our commitments to our various stakeholders.
- ▶ Our innovative model for community management, sources of renewable energy, use of seawater, and sustainability.
- ▶ Our exceptional management of employee relations and talent has made us a preferred employer in Chile.





## STRATEGY

In order to achieve its mission, the Group has a business strategy based on strengthening its current operations and using these as a platform for growth.

## OBJECTIVES

## OPERATIONS AND PROJECTS



- 1. CORE BUSINESS**  
To optimise and improve existing operations.

Los Pelambres, Centinela, Antucoya and Zaldívar.



- 2. ORGANIC AND SUSTAINABLE GROWTH OF THE CORE BUSINESS**  
To achieve sustainable, organic growth, from further developing the areas around the Group's existing asset base in Chile.

Incremental Expansion Project at Los Pelambres.

Centinela Second Concentrator. Encuentro Oxides and the Molybdenum Plant projects at Centinela.



- 3. GROWTH BEYOND THE CORE BUSINESS**  
To seek growth beyond the Group's existing operations both in Chile and internationally.

**Chile:** Exploration.

**United States:** Twin Metals Minnesota.

### 2016 FOCUS

In 2015, the Group had to face a significant drop in the price of copper. 2016 showed little improvement. The lower average copper price, lower grades and greater pressure on efficiency and costs required the operations to face new challenges.

The Group acted quickly and efficiently to respond to these new market conditions while focusing on its ongoing objectives: the safety and health of its employees, responsibility for the environment, commitment to neighbouring communities and meeting its production goals with greater efficiency and lower costs.

With the acquisition of Zaldívar and the commissioning of Antucoya, the Group's production grew by 12.5% over the previous year.

The Group continued to reduce its costs and increase production efficiency. It managed to reduce its operating costs (net cash costs) by 20%, which offset the lower price of copper and helped achieve an EBITDA of US\$ 1,538.4 million, 85% more than in 2015.

The agreement reached with the community of Caimanes marked the start of a new relationship and the resolution of a long-running conflict in the region, paving the way for the future development of Los Pelambres. [+ see p. 41](#)

### DEVELOPMENT PROJECTS

Antofagasta Minerals is advancing feasibility studies for two large projects: one to maintain and increase production at Los Pelambres and the other to extend the life, and increase the production, of Centinela.

The Incremental Expansion project at Los Pelambres, for which the Environmental Impact Assessment (EIA) is underway, will increase production by 55,000 tonnes of copper per year through the investment of over US\$ 1,000 million in a new milling and concentrator line, and a desalination plant, which is required as backup in case of water shortages.

The Environmental Impact Assessment (EIA) for the project

is expected to be approved during 2017. As part of the EIA over 300 people in Salamanca and 500 residents of Los Vilos took part in a public consultation process during which they learned about the details of the project and had the opportunity to ask questions and express their opinions.

The US\$ 4.35 billion Centinela Development (Desarrollo Minera Centinela, DMC) project will increase copper production at Centinela and extend its mine life to 2056. It will take place in two stages: the first involves the development of the Esperanza Sur deposit, which will come into operation at the earliest in 2021; the second involves the development of the Encuentro Sulphides deposit.

The project, which will use seawater, will add two additional pits to the three existing pits, a new concentrator plant and another thickened tailings deposit. Its location will allow it to benefit from synergies with the current deposit, for example, by sharing the route of the concentrate and water pipelines. The Environmental

Impact Assessment was approved in December 2016. The feasibility study for phase 1 is expected to be submitted to the Board for approval in 2018.

For more information on the Strategy, Business Model and Management, visit [www.aminerals.cl/quienes-somos/](http://www.aminerals.cl/quienes-somos/)

## COMPLEMENTARY INFRASTRUCTURE PROJECT

### THE FIRST STEP IN THE FUTURE OF LOS PELAMBRES



Estimated investment: **US\$1,000 million**



Construction time: **2 years**



Peak employment during construction: **3,300 workers**

#### WHAT ARE THE CHALLENGES?

The increasing hardness of the ore and the shortage of water make copper production more difficult.

#### WHAT IS OUR COMMITMENT TO THE CHOAPA PROVINCE?

Any need for new water resources will be met with seawater.

#### WHAT IS OUR PROPOSED SOLUTION?

Incremental Expansion Project.



## INNOVATION TO ACHIEVE COMPETITIVENESS

Ideas, and the ability to implement them, are the lifeblood of Antofagasta Minerals and a constant driver for its management.

### SEAWATER

Historically, the Group has been an innovator in global mining, one example being the thickened tailings technology at Centinela [+ see p. 65](#) and its use of raw, or non-desalinated, seawater. In 2016, 48% of the water used by the Mining Group came from the sea.

The Centinela Mining Development (DMC) project will also use raw seawater, and desalinated seawater will be used for future increases in production at Los Pelambres Mine.

### THICKENED TAILINGS

Centinela was the first large-scale mine to use thickened tailings technology, allowing a greater quantity of water to be recycled and producing smaller and more stable deposits than conventional tailings.

### CLEAN ENERGY

Los Pelambres uses renewable power, such as wind and solar, and currently 42% of its energy requirements are provided from emission-free sources. [+ see p. 57](#)

In the Antofagasta Region, the thermal plant at Centinela uses solar collectors to heat process water, reducing fossil fuel emissions.

### COMMUNITY ENGAGEMENT

The Group also innovates in how it relates to its neighbouring communities, building long-term and transparent relationships through dialogue and engagement. The Somos Choapa process, initiated by Los Pelambres, has allowed for the construction of a joint vision between neighbours, the authorities and the Company. [+ see p. 38](#)

### MINING INNOVATION

Antofagasta Minerals is carrying out test work to progress the development of technology to enable the cost-effective extraction of copper from low-grade primary sulphides.

### PARTNERSHIPS FOR DEVELOPMENT

The Group is participating in a public-private initiative within Corfo's<sup>1</sup> National Strategic Programmes called the Programa Nacional de Minería Alta Ley,<sup>2</sup>

Its objective is to improve productivity, competitiveness and innovation in the mining industry and its suppliers, in order to drive the country's further development.

## INNOVAMINERALS

In 2016, the Group established an innovation platform, INNOVAMINERALS, to encourage the use of such initiatives as permanent practice, regardless of operating needs. The platform promotes the generation and recognition of new ideas that lead to improvement of work practices and the way the Group relates to others, aiming to maximise value for the organisation, the people and the environment.

Another vital component of the AMSA Innovation System was the establishment of the Innovation Board, chaired by the Chief Executive and comprising professionals from different fields. Its role is to define the Group's structure, process and system of innovation, as well as to promote a broad culture of innovation, which will be consolidated in 2017.

<sup>1</sup> The Production Development Corporation (Corfo in Spanish) is a Chilean governmental organization which promotes economic growth in Chile.

<sup>2</sup> [www.programaaltaley.cl](http://www.programaaltaley.cl)

# SUSTAINABILITY GOVERNANCE AND MANAGEMENT

Sustainable development is integral to the Group’s decision-making process and is part of our business strategy. Priorities are the safety and health of our employees, the development of local communities and environmental protection.

## CORPORATE GOVERNANCE

The Board of Antofagasta plc is responsible for the long-term success of the Group, overseeing strategic objectives, setting policies and goals, supervising economic, social and environmental performance and managing risk and internal controls. One of the five committees contributing to these functions is the Sustainability and Stakeholder Management Committee<sup>1</sup>

## THE BOARD

The Board is made up of eleven directors, two of whom are female. None of the members holds an executive role in the company and five are independent directors.

The Board delegates the implementation of strategy and financial objectives to Antofagasta plc’s Chief Executive Officer.

## EXECUTIVE COMMITTEE

The Executive Committee of Antofagasta Minerals, led by its CEO, manages the mining division. This Committee focuses on matters such as the approval of capital expenditure for the operations and the Corporate Centre – within its designated authority–

annual budgetary and planning programmes and the performance of the mining operations. It also promotes the exchange of best practice and the application of policies across all operations.

The Committee is assisted by sub committees that review Operational Performance and Business Development, and by specific committees established to oversee key projects.

## SUSTAINABILITY AND STAKEHOLDER MANAGEMENT COMMITTEE

The Board has ultimate responsibility for matters relating to sustainability. The Sustainability and Stakeholder Management Committee of four directors helps oversee these issues. It makes recommendations to ensure that ethical, safety and health, environmental, social and community factors feature in the Board’s decisions. The Committee guides the Board on sustainability matters by reviewing and updating the Group’s policy framework and strategies, including safety and health, environment, climate change, human rights, community and stakeholder relations. It

oversees performance in these areas and ensures compliance with any commitments undertaken.

## PRIORITIES FOR 2016

In 2016, the Committee met four times, with 100% attendance. Key matters for consideration included the review of the Group’s safety and health strategy, control of the agreements with the community at Los Pelambres, risk evaluation and environmental mitigations and a review of the sustainability issues in the Los Pelambres and Centinela projects. It also examined the operations’ communications strategy, community priorities and investments and compliance with the ICMM agreements. The Committee also reviewed and approved the 2015 Sustainability Report.

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**Further information** on the governing bodies, responsibilities, role and members of the Board can be found in the Annual Report 2016, pages 66 to 112, available at [www. antofagasta. co.uk](http://www.antofagasta.co.uk)

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<sup>1</sup> The other committees are: Audit and Risk, Nomination and Governance, Remuneration and Talent Management, and Projects.



Members of the Board (left to right): Ramón Jara, Jorge Bande, Juan Claro, Gonzalo Menéndez, Francisca Castro, Jean-Paul Luksic, Vivianne Blanlot, Ollie Oliveira, Tim Baker, William Hayes, Andrónico Luksic.

## VALUES AND PRINCIPLES

The Group has a Charter of Values –respect, safety and health, innovation, excellence, sustainability and forward thinking– that guides its decisions in all operations, projects and exploration. It also has an Ethics Code that stresses its commitment to doing business in a responsible and transparent manner. [+ see p. 20](#)

## ICMM

The Group is a member of the International Council on Mining and Metals (ICMM), a world-wide organisation dedicated to promoting sustainable mining by improving standards and encouraging member companies to adopt and share socio-environmental best practice.

Progress made in 2016 on commitments made by Antofagasta Minerals on joining the ICMM include:

- ▶ **Emergency Communications:** a contingency plan was drawn up with the co-operation of the Caimanes community who live near the Mauro tailings dam.
- ▶ **Grievance management:** the procedure for receiving and handling grievances was standardised across all operations, and will be managed centrally. The IT system supporting the procedure sends an alert when response times are not met.
- ▶ **Mine closure, biodiversity and climate change:** new corporate standards were approved for these three issues.

Antofagasta Minerals is a member of the International Council on Mining and Metals (ICMM). Its parent company -Antofagasta plc- is included in the London Stock Exchange's FTSE4Good Index.

## FTSE4GOOD

Antofagasta plc has been included in the FTSE4Good, the London Stock Exchange sustainability index, since 2015. This index includes companies that demonstrate strong environmental, social and corporate governance (ESG) practices and have transparent management. Assessments are based on 300 indicators.





### SUSTAINABILITY INDICATORS

Antofagasta Minerals has set indicators for assessing its environmental and social performance.

Each mining operation has environmental and social goals based on its particular priorities. These indicators are included in the performance agreements for each operation (+ see box) and also in the individuals' performance agreements.

Compliance with these goals is monitored in monthly operating performance reviews and the results are included in the monthly reports submitted to the Board.

In terms of welfare, progress was made during 2016 on the design of welfare indicators in the regions and in the assessment methodologies used for welfare projects, among others.

### ASSESSING SUSTAINABLE PERFORMANCE

The Performance Agreement is a management tool for summarising Antofagasta Minerals' annual focus and goals, allowing us to monitor performance and make any necessary adjustments.

The 2016 Agreement highlights the importance of eradicating fatal accidents and consistently improving safety performance.

Issues directly related to sustainability (social, safety, organisational development and environment) accounted for 25% of the Performance Agreement in 2016.

### SUSTAINABLE MANAGEMENT OF THE MINING CYCLE

The Group creates value for its stakeholders through the discovery, development and operation of mining assets. Antofagasta Minerals is committed to achieving safe and sustainable

mining. We have developed a set of tools - best practices, standards and indicators - for incorporating these social and environmental controls into each stage of the mining cycle, within the framework set by the applicable laws and international standards.

## MINING CYCLE



## RISK MANAGEMENT

The Group has developed a methodology for the timely and consistent identification of risks that may jeopardise the fulfillment of its objectives, establishing controls and responsibilities to prevent or mitigate such risks.

The Board has ultimate responsibility for assessing the nature and scope of significant risks for the Group, and for ensuring that appropriate internal control systems are in place.

Strategic risks and the status of controls are regularly reported to the Board by the Audit and Risk Committee and, when appropriate, to the Committee for Sustainability and Stakeholder Management.

## IDENTIFICATION, EVALUATION AND CONTROL

Risk identification is carried out annually by the executive teams of the Group's operations. Risks are assessed according to their likelihood and potential impact. Preventive and/or mitigating controls are then outlined and assigned to the person responsible for their implementation.

The analysis and control of each risk is carried out through the corporate risk management system, which is constantly monitored by the corporate team.

In 2016, reviews and on-site verification of key risks were strengthened and control methods tightened. The results were presented to the Group's Executive Committee.

## SOCIO-ENVIRONMENTAL RISKS

Key sustainability risks are: fatal accidents or the failure to meet social and environmental commitments, mismanagement of mining waste, concentrate spillages and noncompliance with the operating standards at the Mauro dam.

In 2016, risks relating to non-compliance with the UK's Modern Slavery Act<sup>1</sup> were added to this list.

## MANAGEMENT SYSTEMS

Los Pelambres, Zaldívar and Centinela Cathodes - are ISO 9001 certified. Los Pelambres and Zaldívar are also ISO 14001 and OHSAS 18001 certified.

[More information on risk management, responsibilities, 2016 focus and details of main risks and mitigating measures can be found in the 2016 Annual Report p 20-27.](#)



<sup>1</sup> *Modern Slavery Act*: A UK law on slavery, servitude, forced or compulsory labour, and people trafficking, including victim protection.

# ETHICS, HUMAN RIGHTS AND COMPLIANCE

The Group wants to be known for honest and transparent business practices that respect human rights and the law. We have therefore strengthened our systems to control our own internal procedures.

## REGULATORY COMPLIANCE

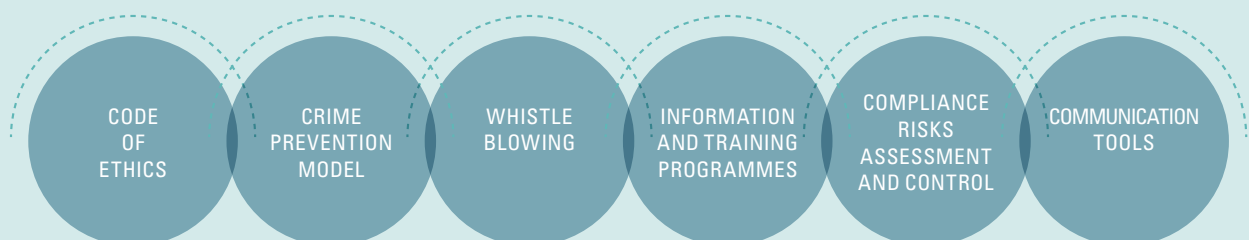
Antofagasta Minerals has established a number of policies, procedures and reporting channels as part of its drive to undertake business in a responsible and transparent manner. These include the creation of a Code of Ethics and an Ethics Committee to oversee it, establishing a whistleblowing procedure and a crime prevention model, and the training and communication to implement this.

This compliance model, which applies both to employees and contractors, is available on the website and is constantly updated using internal communication channels. All agreements with contracting partners include ethics and crime prevention clauses.

Antofagasta Minerals also has internal regulations that govern its daily operations, such as a Charter of Values and guidelines on several areas of possible

regulatory infringement. The latter include Conflicts of Interest (applicable to employees, contractors and suppliers), Gifts and Hospitality, Commercial Relations (for companies linked to politically exposed persons), Due Diligence, Facilitation Payments and Community Investments. The antitrust procedures and Ethics Committee's bylaws, among others, are regularly reviewed.

## COMPLIANCE MODEL





### CODE OF ETHICS

The Code of Ethics<sup>1</sup> was updated in 2016 and covers the Group’s dealings with shareholders, employees, authorities, communities, clients, suppliers and commercial partners. It sets out standards for a number of areas, such as conflicts of interest, information management, bribery and corruption, as well as respect for human rights, local values and traditions and the rights of neighbouring communities.

The Code applies to all companies and projects in the Antofagasta Minerals group, in Chile and abroad.

The Ethics Committee investigates reports of non-compliance. It receives, hears and investigates all reports of irregularities, and decides on courses of action and whether to apply sanctions. It works to develop procedures to promote ethical behavior, as well as managing and overseeing the operating standards required by the Code of Ethics and other related regulations. It also establishes the promotion of these ideals and their integration into training processes.

### CRIME PREVENTION

The Group has a crime prevention model in order to comply with anti-

bribery and anti-corruption laws in the United Kingdom and Chile. This covers issues such as money laundering, terrorist financing, bribery, payoffs and handling stolen goods. It applies to all executives, employees and contractors. Given that anti-corruption laws are cross-border, the Group enforces the toughest standards, regardless of the country of operation. Currently it ensures compliance with the UK Bribery Act.

### WHISTLEBLOWING

The Group has established clear channels of communication for anyone wishing to report any

irregularities they may have encountered. These are available through the website, via email or by telephone, and can be made anonymously.

The Group also has mechanisms for formal and informal consultation and feedback, so that employees, contractors and communities can express concerns and submit complaints. All such reports are investigated and the conclusions presented to the Ethics Committee.

In 2016, 67 reports related to the Code of Ethics were received through these channels.

<sup>1</sup> Available at [www.aminerals.cl/quienes-somos/valores-y-principios/](http://www.aminerals.cl/quienes-somos/valores-y-principios/)

## TRAINING

There is a comprehensive training programme to ensure that policies and procedures from the Compliance Model are fully understood and truly embedded in the organisation's culture.

The programme emphasises the right to know and reinforces the skills needed for effective implementation.

Training methods are both face-to-face and via e-learning. In 2016, nearly 2,000 employees were trained via e-learning and seven compliance workshops were conducted for employees, with a further six for contractor company employees, which focused particularly on the Code of Ethics and the crime prevention model.

All new employees of the Group undergo an induction process during which all such policies are explained.

## ASSESSMENT AND AUDITING

The aim of the annual compliance risk assessment is to identify, ensure and improve internal controls in order to prevent such risks.

The Group's corporate audit programme addresses sustainability matters.

Audit management operates independently of management and reports directly to the Board's Audit Committee.

The annual internal audit plan includes the assessment of ethics, safety and health, environmental performance and social responsibility - both at Group level and for each operation.

In 2016 an audit was carried out on the effectiveness of controls in key areas, such as the prevention of corruption, unethical practices and fatal accidents. It also examined the execution of the Somos Choapa initiative (+ see p. 46); and environmental management plans and the latter's compliance with environmental commitments.

As a result, the respective areas set up action plans to address any detected deviations from the controls and avoid or mitigate situations affecting people's safety, compliance with regulations and the Group's reputation or the continuity of operations.

The audit team is responsible for ensuring internal controls are effective and performed as designed. The internal annual audit plan is based on the Group's risk matrices and its operations. As a result of the audits, measures are proposed to address any control deficiencies.

## HUMAN RIGHTS

The Group's corporate policies and guidelines cover respect for the human rights of the various stakeholders and indigenous peoples, which are included in the Code of Ethics, and some of the issues are supervised by the Board's Sustainability and Stakeholder Management Committee. These issues have also been incorporated into audits carried out by the Group.

In 2016, progress was made on incorporating matters covered under the United Kingdom's Modern Slavery Act (MSA) into the internal processes for supplier vetting and in contractual clauses. In January 2017, Antofagasta plc published its MSA statement including its action plan. The subject of human rights was also included in the audits carried out by the Group on its operations, and in the employee induction and e-learning programmes.

**More information** at [www.antofagasta.co.uk/modern-slavery-statement](http://www.antofagasta.co.uk/modern-slavery-statement)

To ensure adequate community protection in case of emergencies, Los Pelambres worked with the Caimanes community to develop a contingency plan involving potential evacuation of the community.

+ see p. 40

## INDIGENOUS PEOPLES

Antofagasta Minerals guarantees its respect and compliance with its commitments undertaken within the framework of Convention 169 of the International Labour Organisation (ILO) concerning indigenous peoples, as well as the recommendations of the ICMM. Of its four operations, only Zaldívar has contact with indigenous peoples at its water source close to Peine, which is located within the Indigenous Development Area known as "Atacama la Grande".



## COMPLIANCE WORKSHOPS

The aim of these workshops is to consolidate the Group's Compliance Model and to create awareness among employees about the impact of these actions on the business's daily activities. Such face-to-face meetings examine practical cases that help illustrate these complex topics.

During 2016, seven compliance workshops were attended by nearly 300 people.

## SUSTAINABILITY GOALS

Below are the goals set out by the Group for 2016 regarding sustainability.

### CORPORATE GOVERNANCE

GOAL	PERFORMANCE	COMMENTS
Update the corporate Sustainability Policy <b>ICMM COMMITMENT<sup>1</sup></b>	●	In April 2017 the Board approved the updated Sustainability Policy, which incorporates, among other things, the commitments required by the ICMM.
Strengthen the corporate risk management system.	●	The revisions and on-site verification of key risks control performance were strengthened. <b>+ see p. 18</b>
Strengthen the policies, procedures and channels to safeguard compliance.	●	The Group's Compliance Model was established with its six key dimensions and distributed throughout the organisation. <b>+ see p. 19</b>

### ENVIRONMENT

GOAL	PERFORMANCE	COMMENTS
Zero incidents with significant environmental impact.	●	In 2016, there were no incidents with significant environmental impact. <b>+ see p. 50</b>
Ensure full execution of the controls (management plans) for all key environmental risks.	●	96% of the plans were successfully implemented. Partial progress has been made on the remainder.
Generate a standard for the closure of mines <b>ICMM COMMITMENT<sup>1</sup></b>	●	Approved by the Chief Executive in August 2016.
Progress on the implementation of the corporate biodiversity standard.	●	A survey was conducted of the species and ecosystems that might be impacted, applying the new criteria.
Progress on the implementation of the corporate climate change standard.	●	Projects were identified for increasing the efficiency of each of the operations, and are being analysed according to the abatement curves.
Establishing a compliance plan for all the Group's environmental commitments.	●	In 2016, an environmental management model was designed for compliance with legal commitments, which will be implemented and applied across all the Group's operations. <b>+ see p. 50</b>

**SOCIAL**

GOAL	PERFORMANCE	COMMENTS
Eliminate fatal accidents.	●	An employee lost his life in an accident at Antucoya. <a href="#">+ see p. 26</a>
Discuss socio-environmental risks and plans to prevent and control potential emergencies with local stakeholders. <b>ICMM COMMITMENT<sup>1</sup></b>	●	A Contingency Plan was produced for Caimanes, which complements the Operations Emergency Plan for the Mauro dam. <a href="#">+ see p. 40</a>
Roll-out of the Somos Choapa methodology, of dialogue and contribution to the community, in all the municipalities of the Choapa Province.	●	In 2016, we began to roll out the Somos Choapa methodology in the Los Vilos municipality, thereby covering the whole Choapa Province. <a href="#">+ see p. 46</a> Furthermore, the engagement process methodology was embedded in Antofagasta as well.
Reach an agreement with the Caimanes community and create a joint work plan.	●	An agreement approved by the community and the authorities was signed undertaking to comply with court decisions and address the residents' legitimate concerns, generating a long-term joint work plan. <a href="#">+ see p. 41</a>
Generate a grievance system at Group level to address the concerns and worries of communities. <b>ICMM COMMITMENT<sup>1</sup></b>	●	Progress was made on standardising the grievance management system and its corporate management. <a href="#">+ see p. 37</a>
Eliminate severe social incidents.	●	No severe social incidents were recorded in 2016. Progress was made on reaching and implementing the agreements to resolve the Group's long-standing conflicts. <a href="#">+ see p. 39</a>

- Commitment fulfilled
- Commitment partially fulfilled
- Commitment unfulfilled

<sup>1</sup> Indicates that this goal is part of the commitments made by Antofagasta Minerals when joining such entity.





# COMMITMENT AND TRANSPARENCY

The Group works on the basis of excellent relations with, and commitment to, our shareholders, employees, suppliers, clients and the neighbouring communities which host our operations, projects and explorations.

## OUR APPROACH

The aim is to build good relationships with stakeholders and we continue to develop our skills in listening, understanding and managing expectations and concerns, thus benefitting everyone involved.

In terms of community relations, we continue to build a shared vision of the future development of the regions in which we operate.

### COMMUNICATION CHANNELS

Antofagasta Minerals uses various methods to inform and listen to stakeholders, with a particular emphasis on maintaining continual dialogue with employees and local communities.

Every year the Group publishes an Annual Report, production reports, financial statements, a Sustainability Report and a Carbon Disclosure Project reports, among others. It also has regular meetings with investors, clients and other stakeholders, as well as having an internet presence through its websites and major social networks.

### EMPLOYEES

Antofagasta Minerals is in continuous dialogue with its employees. Opinions can be aired through collective bargaining

forums, the performance management system, surveys and studies. [+ see p. 30](#)

### COMMUNITY

Dialogue with communities takes place at formal forums managed by the Group's operations, including work groups, visits, grievance mechanisms and citizen engagement processes. In 2016, topics included centralising the grievance systems and progressing the stakeholder engagement processes.

[+ see p. 36](#)

Since the incorporation of Zaldívar, the relationship with its local indigenous communities has strengthened, maintaining a mutual respect as established by the International Labour Organisation (ILO) and the ICMM.

[+ see p. 21](#)

### PUBLIC ROLE

Mining in the 21<sup>st</sup> century in Chile requires greater co-operation between the public and private sectors. Antofagasta Minerals, as the leading non-state Chilean mining company, has driven this process as part of its long-term strategic vision. Its executives and directors have acted in leadership roles to produce a strategic national agenda for mining and the creation of programmes through public-private alliances (Valor Minero and Alta Ley) to ensure its implementation. They also chair the Mining Council and participate in the National Mining Society, the National Council on Innovation for Competitiveness and the Enterprise Action foundation.

Internationally, the Group belongs to the International Council on Mining and Metals (ICMM), the

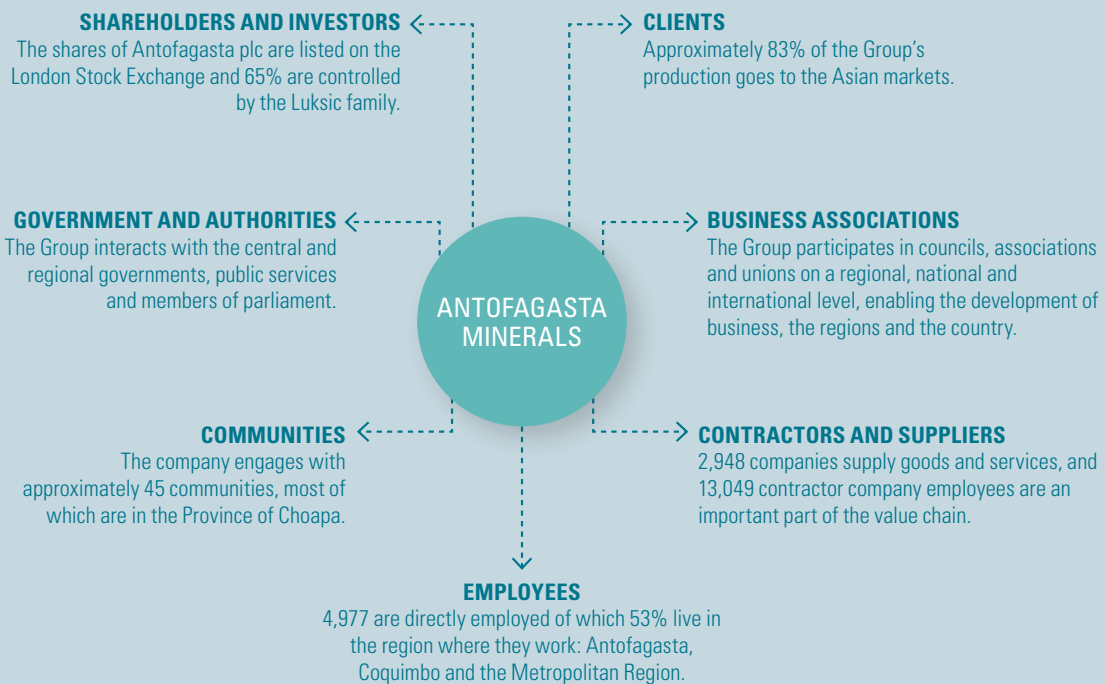
International Copper Association (ICA) and the International Molybdenum Association (IMO), among others. Its operations participate in industrial regional associations as well as relevant local organisations.<sup>1</sup>

In order to have a voice at the national level, the company requests meetings with the authorities through Chile's public platforms.

In 2016, the Group did not make any political contributions.



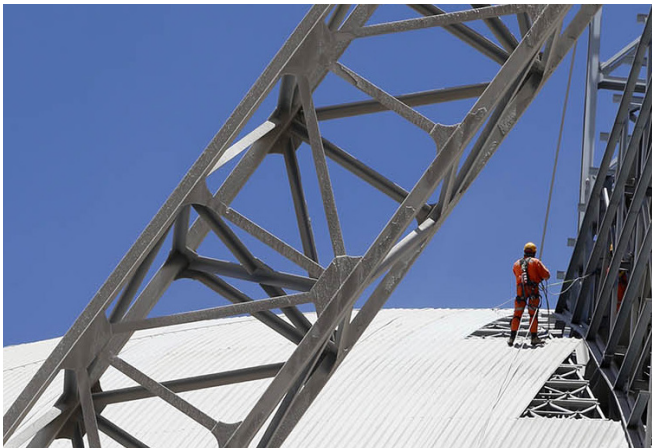
## STAKEHOLDERS



<sup>1</sup> In the II Region of Antofagasta: The Association of Antofagasta Industries, the Association of Mejillones Industries, the Mining Coalition, the Gender Coalition for the Integration of Women in Mining, Creo Antofagasta, the Corporation for the Development of the Province of the Loa, Catholic University of the North, the University of Antofagasta, the Gaviotín Chico Foundation, the Coalition Buenos Vecinos de Sierra Gorda, the Pro Antofagasta Corporation, among others. In the IV Region of Coquimbo: The Industrial Corporation for the Regional Development of Coquimbo, the Regional Agency for Productive Development, the Corminco Mine Regional Council, the Río Choapa Supervision Committee, as well as canal and drinking water associations. It also collaborates with La Serena University.

# ERADICATE FATALITIES AND OCCUPATIONAL DISEASES

Antofagasta Minerals has worked hard to decrease the number and severity of accidents affecting its direct employees and contractors and was deeply saddened in 2016 when, despite these efforts, an employee at Antucoya lost his life. The goal remains the same: to eradicate fatal accidents and occupational diseases from our Mining Group. No operating goal is more important than a person's life.



## OUR APPROACH

In order to eradicate fatal accidents from our operations we have been promoting a unique safety and health management model since 2013, following best international practices and ICMM recommendations.

This model focuses on preventing accidents that have the potential to be fatal or cause severe disablement and its four pillars are:

- ▶ Identifying, understanding and managing the main fatality risks in all of our operations, projects and exploration sites.
- ▶ Implementing and verifying critical controls for each fatality risk and, in the absence or failure of such controls, stopping the task.
- ▶ Reporting, investigating and implementing corrective actions to avoid high potential risks.
- ▶ Establishing a "safety culture" whereby each executive, supervisor, contractor and operator takes responsibility for leadership practices on the ground.

## CONTEXT

Mining in Chile is governed by the Labour Code for safety in the workplace and overseen by the Labour Inspectorate. Given the risks involved, Mining Safety Regulations are also overseen by the National Service for Geology and Mining (Sernageomin).

## MANAGING FATALITY RISKS

Between 2006 and 2016, 11 risks were accountable for all fatal accidents and 95% of near-misses. During the first stage of this project, the focus was on establishing critical controls for each risk. The responsibility for

the management of each risk was identified and verification tools started to be used by operators, supervisors and executives.

During 2016, the Group established fatality risks across the operations, simplifying the on-site verification tools, increasing the reporting of near-misses, and expediting the rollout of the new model to contractor companies, to strengthen the performance in these areas through the Special Corporate Safety and Health Regulation for Contractors and Subcontractors (RECSS). This tool focuses the efforts of each contract administrator, who is accountable for the safety of the

contractor companies' employees. In early 2017, fatality risks were established at Mining Group level.

## STANDARDISING FATALITY RISKS

Antofagasta Minerals identified 15 fatality risks. During 2016, workshops were held in order to establish critical controls to prevent such risks. These workshops were attended by experts, executives, supervisors and operators from the company and from contractor companies. The new control verification tools were developed with the information gathered in these workshops.

Mining is a job with many risks and there is no infallible methodology, so it is vital to implement a change in culture that prioritises safety and health. Awareness creation and training are underway at all the Group's operations to achieve this.



### ESTABLISHING A RESILIENT SAFETY CULTURE

Antofagasta Minerals is moving towards a resilient safety culture, in order to deal with, overcome and learn from adverse situations.

This progress is reflected in the updated Strategic Safety and Health Model, which sets clear milestones. The first and second element in this model is safety and health risk management, in other words, identifying and controlling fatality and occupational diseases risks. The third is continual reporting and improvement, aimed at learning from experience and identifying synergies. The fourth element is leadership, using the tools provided by the updated model.

#### ON-SITE SUPERVISION

The Executive Committee of Antofagasta Minerals regularly visits the operations to recognise employees for outstanding safety behaviour, to ensure that critical controls for fatality risks are being implemented effectively and finally to review high risk accident investigations and their corrective actions. These visits reflect the Committee’s overriding concern that all employees have been trained in the key aspects of safety and health.

#### SAFETY CULTURE SURVEY

A safety culture survey was carried out on 3,045 employees, (41% of them internal and 59% from contractor companies) to identify strengths and weaknesses of safety matters and assessed seven areas: organisation, leadership, processes, influences, attitudes, standards and tasks. The results were presented during 2016, and the main weaknesses were found to be recognition and

leadership. Another key finding suggested that complacency is an issue and that more must be done to increase risk awareness. The findings led the Executive Committee to develop actions that are now being implemented both in the technical and adaptive fields.

#### AUDIT

Compliance with the safety and health model is audited twice a year in each of the Group’s operations, development and exploration projects. Results are presented to the Group’s executives and to the General Manager of each operation. In 2016, the Group’s safety and health experts carried out 10 simultaneous audits at the different mines, to reinforce safety as a priority.

#### SAFETY PERFORMANCE

In April 2016, Franco Torrejón, who worked at Antucoya, died as the result of an accident. This was a deeply sad and painful occurrence from which the Group’s has learnt important lessons. The most important of which were improving compliance with the company’s safety standards and the timely management of early warnings.



### SAFETY FIGURES FOR EMPLOYEES AND CONTRACTORS\*

	2014	2015	2016
All Injury Frequency Rate (AIFR)	5.0	6.9	6.9
Lost Time Injury Frequency Rate (LTIFR)	1.1	1.2**	1.2
Near Miss Frequency Reporting (per million hours worked)	7.8	13.5	50.2
Number of fatal accidents	5	1	1

\* All data on the Group’s safety performance take into account direct employees plus contractors working in all our mining operations.

\*\* The figure published in the 2015 Sustainability Report has been changed to include one lost-time accident in the Corporate Offices that was omitted in the 2015 Sustainability Report.



In 2016, the Lost Time Injury Frequency Rate, which measures serious accidents, and the All Injury Frequency Rate, stayed the same as in 2015. There were positive changes in the number of reported near-misses, which increased by 272%. This reflects the efforts made to simplify the reporting process and an increase in employees’ willingness to identify high risk situations in order to prevent accidents.

## SAFETY INNOVATION

### PERFORMANCE IMPROVEMENT PROGRAMMES

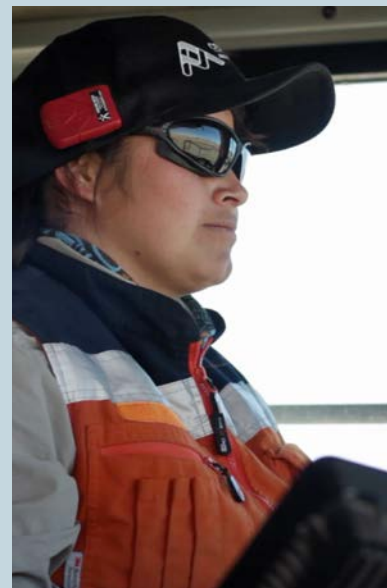
Antofagasta Minerals is incorporating three technical innovations at its operations in order to prevent accidents in the pits: a collision avoidance system for all vehicles and mobile equipment in the pits, a fatigue and drowsiness detection device and driver training simulators.



**Collision avoidance system (CAS GPS):** A system that detects near-by vehicles and mobile equipment, warning the driver on a screen with progressive audible and visual warnings.



**Simulator cabins:** For operator training, preparing them to respond correctly to the main risks when driving mining equipment.



**Fatigue and drowsiness detection device (SmartCap):** A sensor installed in the caps worn by operators, which detect levels of fatigue through skin sensors.

## OCCUPATIONAL HEALTH

The Group has identified the risk factors that could cause occupational diseases: silica dust, sulfuric acid mist, ionising radiation, solar radiation, height and noise. Each operation works on the prevention and management of these risks, seeking to avoid the likelihood of these types of diseases. In 2016, work started on the definition of 10 occupational health standards, which set out the compulsory requirements necessary to ensure

safe and healthy workplace environments, as well as requirements to manage drivers, agents and any conditions that pose health risks which could cause serious or fatal accidents at work, or occupational diseases.

During 2017, the focus will be on five different issues: ensuring compliance with minimum legal requirements; defining health and hygiene standards and developing a preventative model that will include the

form of management, reporting and continuous improvement; Implementing health standards; defining fatality risks and disabling diseases associated with health and hygiene, and will later be used to reassess critical controls and verification tools; and finally, identifying, assessing and implementing projects to reduce exposure in a systematic way and to set annual goals.

# COMPETITIVENESS BASED ON VALUES

The Group intends to overcome the challenges it faces by taking advantage of synergies across its operations and encouraging employee commitment based on shared values, a corporate vision and an attractive value proposal.

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## OUR APPROACH

The corporate strategy for human resources underpins the overall business strategy, especially in complex economic conditions, and is based on four pillars:

- ▶ An organisational model that exploits synergies amongst the Group's operations to remain competitive.
- ▶ A corporate culture based on the Charter of Values and respect for human rights.
- ▶ The development of employees' talents and skills.
- ▶ Strengthening employees' commitment and managing labour relations using the highest standards.



## CULTURE AND ORGANISATIONAL MODEL

The Group wants its workforce to make a strategic contribution to the business. In 2016, in order to tackle the twin challenges of competitiveness and costs, work processes were reviewed and duties reorganised in some departments. The aim was to identify simple and effective management models with clearly delineated responsibilities, in line with the Group's desire for continuous improvement. More efficient administration meant reducing the duplication of activities and this in turn led to downsizing across all the

operations, particularly at the supervisor level. Only Antucoya increased its headcount, in order to meet its design capacity in line with the production plan. In 2016, the Antofagasta Minerals workforce, including company employees and contractors, totalled 18,026 people.

### SHARED VALUES

Regarding the Mining Group's culture, in 2016 the focus was on responsibility for safety, which is a core value. Outstanding employees were recognised on a Group level and in each operation. The executive leadership programme was updated as a

result of the Safe Map safety culture survey, implemented across the Mining Group in 2015. The incorporation of the Zaldívar Mine into the Mining Group meant its inclusion in the shared values culture. **+ see box**

## INTEGRATING ZALDÍVAR INTO THE GROUP

Integrating Zaldívar into the Mining Group has been a challenge both on an operating and organisational level, and has required significant effort in all areas of human resource management.

Some of the initiatives carried out in 2016 were:

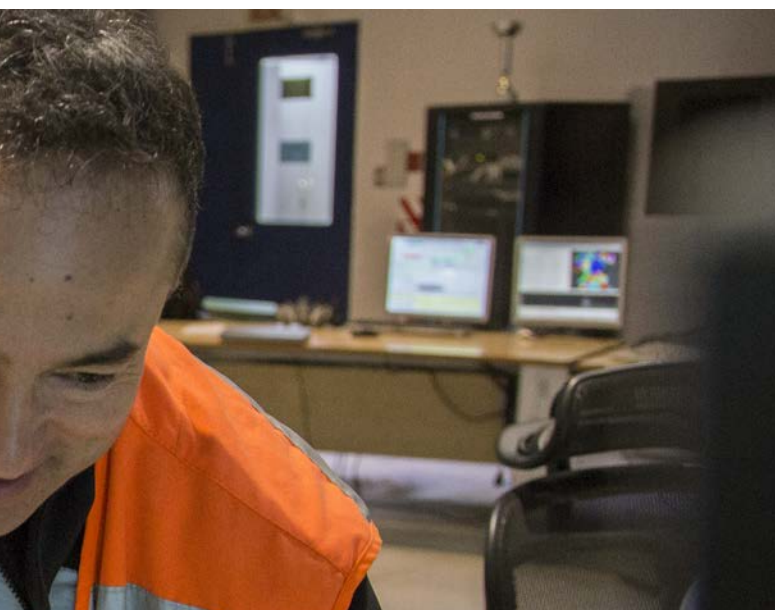
- ▶ Implementation of the Performance Management System for Zaldívar.
- ▶ Training agents at Zaldívar to convey the Charter of Values to approximately 600 employees.
- ▶ Distribution of the Code of Ethics and obtaining undertakings from all employees to comply with it.
- ▶ The Group's value proposal was communicated via the "Discover Antofagasta Minerals" campaign.

As a result, great progress has been made in the successful integration of the organisation's culture and the full use of synergies with other Group operations.

### WORKFORCE<sup>1</sup>

	2014	2015	2016
Direct employees	4,683	4,586	4,977
Contractors	19,542	14,892	13,049
<b>Total workforce</b>	<b>24,225</b>	<b>19,478</b>	<b>18,026</b>

<sup>1</sup> Annual averages. Includes operations and projects from the four mines and the Corporate Centre, and full-time and fixed contracts. Up to 2015 it included Michilla Mine and after 2016 it includes Zaldívar.







## TALENT MANAGEMENT

Antofagasta Minerals' talent management system ensures employees are competent, committed and take responsibility for their own development, while contributing to sustainable business growth. The priority is to strengthen existing roles through a performance management system, while offering training and transfer opportunities.

In 2016, a US\$1.5 million investment secured 152,197 hours of training, averaging 30.6 hours per employee. Training examples include the executive leaders' programmes, the internship programme and regulatory compliance training. [+ see p. 21](#)

To guarantee the necessary competencies and skills, we have run a young professionals programme for the past seven years. A total of 142 professionals have been trained, of which 31% are women. In 2016, in line with business criteria, a shortened version was held, with three women and four men, focusing on operating specialisations.

To maintain sustainability, our ongoing strategy is to identify the most appropriate skills for each task and to prioritise internal promotion. However, due to the restructuring and streamlining, fewer roles were filled internally than in 2015, with a total of 52% of key roles and 27% of supervisory roles being filled internally.

## QUALITY OF LIFE AND BENEFITS

The Group commits to its employees with a clear and attractive value proposal that

emphasises the advantages of being part of a young and growing Group. The Value Proposal, published in 2015, confirms that Antofagasta Minerals' management is based on values, is committed to the development of its employees and the country, and is focused on maintaining its leadership on the basis of innovation, safety and excellence.

## QUALITY OF LIFE AND BENEFITS

One measure of the quality of employment offered by the Group is the standard of employees' safety at work. Another is the quality of the facilities at the mine site. A third is salary levels, which are well above the national legal minimum wage. The Group requires its contractors to offer the same advantages to their own employees.

The operations are constantly improving their camps and their recreational areas and activities. Benefits, which include complementary health and life insurance policies, as well as fair pay, incentives and working hours, are set out in the employment contracts and collective agreements.

During collective labour negotiations held at Los Pelambres, Antucoya and Zaldívar in 2016, joint committees were formed to analyse both health and family protection systems, benefits, employee development and mobility, and proposing improvements where necessary.

## GENDER DIVERSITY

The company recognises the importance of improving gender

diversity and equal opportunities for women. In 2016, Antofagasta Minerals had 431 women employees, equivalent to 9% of its workforce. Of these, 10% were heads of departments. The Group has one female Vice-President and two female Board directors. The training programme for mine operators' apprentices and young professionals has successfully included more women and plans were made to set a gender diversity strategy and develop action plans in 2017 to promote the integration and development of women across the Group.

## WORK RELATIONS

The Mining Group values and respects the participation of employees in matters of interest to them through bodies such as joint committees and unions. Good work relations are based on good working conditions, trust and ongoing dialogue. Potential conflicts have been proactively addressed and agreements reached that are beneficial for both parties. Up until 2016, none of the mining operations in the Group has faced an employee strike.

Work relations are formally based on legal compliance and the Group's values and Code of Ethics, which are predicated on respect for human rights<sup>1</sup>. Furthermore, to ensure compliance with United Kingdom legislation and regulations regarding Modern Slavery, a review was made of the Group's Work Regulations and Policies.

[+ see p. 21](#)

## UNIONS

In 2016, supervisors at Centinela formed a new union, bringing the current total to 10 unions in the

Group: three at Los Pelambres, four at Centinela, two at Zaldívar and one at Antucoya. The percentage of unionisation and coverage of the collective labour agreements is 68% of employees. During the year three collective negotiation processes were held at Los Pelambres, Zaldívar and Antucoya resulting in collective agreements that will remain in force until 2019.

In accordance with the recent Labour Reform law (No. 20,940), effective 1 April 2017, the Group is redesigning its personnel management models – wages, contracts and services – and adjusting its collective instruments and agreements to ensure consistency across all areas of the business. Measures include intensive training in legal matters for supervisors and executives and working with unions to incorporate new rules and requirements into work schedules.

<sup>1</sup> Chilean legislation guarantees basic protection of employees' human rights, such as minimum wages, maximum working hours, decent working conditions, freedom of association and the prohibition of forced labour and child labour.

# OUR STRATEGIC PARTNERS

In order to meet the Group's objectives and improve competitiveness, it is important to have consistent work standards and mutually beneficial relationships with contractor companies and suppliers, and providing productivity advice for our main contractors.

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## OUR APPROACH

The Group intends to develop stable relationships with competitive suppliers that share its values and best practices. To that end, we have established guidelines for contracting goods and services and provided technical consultancy for contract managers.



## CONTEXT

The large mining companies in Chile subcontract specialist ancillary services. Contractor companies provide ongoing support services for the operations, such as maintenance, transport and catering, and temporary services associated with projects, mainly the construction of new facilities or expansions. The number of people providing services as project contractors can vary significantly from one year to the next, according to the scale of the required works.

## VALUES AND STANDARDS

The main supplies and services used by Antofagasta Minerals are energy, fuel, spare parts, reagents, maintenance, catering, construction and installation. During 2016, contractors represented 72% of the workforce so, their good management and high performance standards are key to the Group's success and reputation.

Antofagasta Minerals requires contractor companies to comply with the country's laws and regulations, as well as the Group's Charter of Values and Code of Ethics. In addition, as the client company, Antofagasta Minerals sets standards to ensure a safe working environment and quality of employment. For example, it sets a minimum ethical salary that is 70% higher than the legal minimum in Chile, and basic benefits that include life and health insurance. These requirements are part of the contracts with contractors and are audited regularly.

At Antofagasta Minerals, contractors have access to the same camps and canteens as Group employees, and benefit from the same safety and health standards. [+ see p. 26](#)

## AUDITS OF CONTRACTORS

During 2016, 45 audits were carried out on contractor companies with a particular focus on those companies that has had had unsatisfactory results last year<sup>1</sup>. Work was also started on aligning Zaldívar's contractor companies with the Group's standards. The Group also progressed with the application of the UK's Modern Slavery Act in the suppliers' vetting processes and contract clauses. All new suppliers are pre-checked to assess possible risks so that the necessary precautions can be taken before entering into a relationship with any new company.

The corporate management for Procurement, Safety and Health, Human Resources, Environment, and Public Affairs works closely with these companies in order to ensure the transfer of best practices, management models and priorities, and so far over 300 contract administrators have been trained in regulatory compliance.

<sup>1</sup> The number of contractor audits in 2016 was significantly less than in 2015 as the emphasis was placed on them reviewing their own workers.



# PROMOTING DIALOGUE ACROSS THE TERRITORY

We are convinced that maintaining good relations with communities in the areas near our operations requires an innovative approach to communications and how we contribute to their welfare. This is why we continue to advance the implementation of our community engagement process, with the aim of building a shared vision for local development.

## OUR APPROACH

Antofagasta Minerals believes in contributing to the sustainable development of the areas and communities in which it operates. This means understanding the area's challenges and becoming part of the solution by deepening the engagement processes aimed at building a shared vision in order to foster local development

This approach is consistent with stakeholders' expectations and is aligned with our corporate values and approach to human rights and adherence to the ICMM principles. [+ see pp. 15 y 21](#)

## ENVIRONMENT CHALLENGES

Antofagasta Minerals operates in very different geographic regions in Chile. Centinela, Antucoya and Zaldívar are located in the north of the country, in the Atacama Desert, in an area with a history of mining and with a low population density.

Los Pelambres is located in the Coquimbo Region, in the central part of the country. Its operation is across the Choapa Valley, from

the mountains to the sea, which is home to over 80,000 people in 42 communities, working in agriculture, farming, artisanal fishing and tourism.

This geography, along with changing social expectations, has made the challenges facing the mining industry in its coexistence with local communities more complex for Los Pelambres than for the operations in the north. The Group has therefore reframed its approach with a new

community engagement process, being rolled out across all of the operations.

## COMMUNITY CONCERNS

Key concerns in the Coquimbo Region are water scarcity, coexisting with mining operations and human safety in case of emergencies. To manage these concerns and find joint solutions, Antofagasta Minerals participates in various forums with local stakeholders. In 2016,



the Group made progress on the commitment to hold discussions with the community regarding these issues, and reached several important agreements.

+ see pp. 39 y 41

Since the incorporation of Zaldívar, the Group has intensified its existing relationship with the indigenous communities in the Peine area to maintain a respectful and mutually beneficial relationship reinforced by dialogue and understanding. + see p. 21

## DIALOGUE MECHANISMS

In order to sustain an ongoing relationship with communities, the Group's operations use various formal communication mechanisms, such as discussions with residents, working groups, meetings, joint monitoring, community visits to the mines and the use of media, websites and social networks. It also has a system to ensure the follow up on commitments undertaken with the community and to investigate and respond to any complaints.

In 2016, grievance management and social and environmental commitment procedures were standardised across the Group. Most of the 87 grievances received in 2016 related to unpaid contractors and subcontractors' invoices.

## ENGAGEMENT PROCESS

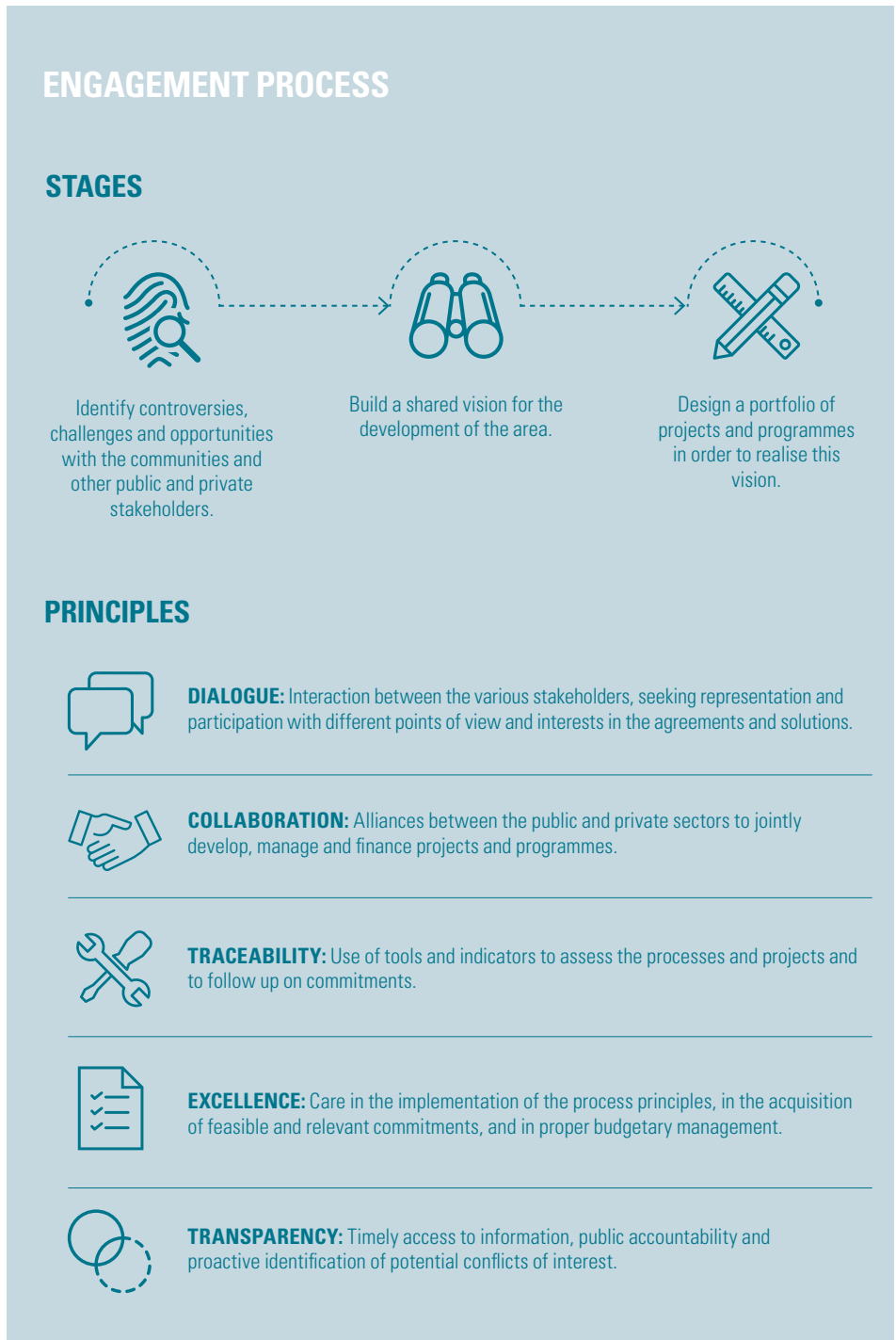
Antofagasta Minerals has transformed the way it interacts with its neighbours, prioritising open dialogue with local communities and other stakeholders in the area, building a shared vision for development, and promoting varied projects and programmes to realise this vision. This new approach was first applied at Los Pelambres and its surrounding area under the name 'Somos Choapa'.

### METHODOLOGY

Using the principles of dialogue, collaboration, traceability, excellence and transparency, this process establishes a methodology to maintain ongoing dialogue with communities, authorities and other stakeholders, reducing information asymmetry and offering space for all parties to participate in decision making. Somos Choapa represents an integrated platform for the sustainable development and a joint opportunity for public and private investment in the short, medium and long term.

### PROJECT PORTFOLIO

In 2016, progress was made on the implementation of the project portfolio derived from the Somos Choapa initiative and on the inclusion of the municipality of Los Vilos into this dialogue. There was also progress in the Antofagasta Region around participative dialogue for community engagement with the residents of Calama Poniente. [+ see pp. 46 y 47](#)



## SOCIAL IMPACT AND RISKS

Antofagasta Minerals identifies and manages the social risks and impact of its operations and projects. It takes responsibility for the legitimate concerns of the community regarding coexistence with the mine and how to act in the event of any emergencies that might affect them.

### SOCIAL IMPACT

During the construction stage of the mining project, social impacts are mainly associated with the arrival of large numbers of temporary employees to the communities surrounding the mine and the increase in vehicle traffic. During the operating stage, the social impacts change to road safety, residents' perception of risks regarding air and water quality, the availability of water for irrigation and the safety of facilities in emergency situations.

On launching a new project, Antofagasta Minerals holds early citizen engagement events in addition to the mandatory consultation required by Chilean law. For example, the desalination plant that will be built as part of the Los Pelambres Incremental Expansion project [\(+ see p. 12\)](#), was explained to over 800 residents of Salamanca and Los Vilos, who had opportunities to voice their concerns, opinions and suggestions before the project entered the Environmental Assessment System.

Regarding road safety, periodic accident prevention programmes and education initiatives are held in conjunction with the authorities.

### SHARED CONCERNS

In the Choapa valley, issues concerning water and air are particularly important. To make the monitoring process more transparent and the results more accessible, joint water quality monitoring has taken

place regularly since 2011. Representatives from the community and Los Pelambres take part in the sampling process together with a technical team from the authority responsible for taking the samples, which are analysed at accredited laboratories. Currently three teams are sampling the Choapa River, the Pupío stream and the Camisas stream and the results are published on the website of the Choapa River monitoring Board and are discussed at community meetings.

Los Pelambres has a representative on the Choapa River Board and collaborates with canal and drinking water associations to monitor the availability and management of water resources in the Choapa Province. The mine also committed to finding solutions to the problem of water availability when it signed the Salamanca Agreement and ensuring the availability of water was also one of the subjects of the Caimanes Agreement. [+ see p. 41](#)

Los Pelambres has also agreed with the Cuncumén air quality forum to establish measures and controls for the mitigation of particulate matter in nearby facilities where the community helps assess the controls on a daily basis.

[More information on water and air management is on pages 51 and 60.](#)

### SALAMANCA AGREEMENT

In February 2015, a group of residents from Salamanca blocked the access road to Los Pelambres, demanding that the mine waive its rights to use water from the Choapa River. Using its new community engagement process, the mine faced this crisis with a progressive approach, accepting the residents' distress under difficult drought conditions and their expectation that the mine should contribute to finding solutions.

To achieve this, Los Pelambres led a discussion with representatives from the municipality, water-dependent organisations, the government and local congress. As a result, in March 2015 the Salamanca Agreement was signed, defining measures for dealing with drought in the short, medium and long term and coordinating the efforts of public and private stakeholders.

Significant progress has been made since the agreement was signed, including:

- ▶ Los Pelambres commitment to use seawater in its new projects. Studies for a desalination plant to partially supply the operation during critical periods have been submitted for environmental assessment.
- ▶ Studies have been carried out to support the government initiative to build a desalination plant for drinking water. Los Pelambres agreed to widen the scope of the feasibility study for its own desalination plant, which will produce industrial water, looking for synergies with the creation of a public desalination facility.
- ▶ The national Water Agency awarded a tender for the implementation of an

integrated water resources management plan in the Choapa River basin. Results are expected by the end of 2017.

- ▶ Within the framework of the agreement between Los Pelambres and the Regional Development Corporation, a plan was agreed for supporting the Rural Drinking Water associations and improving the water infrastructure for small farmers in the Salamanca area.

In 2017, Los Pelambres will continue to develop these initiatives and continue the work of the committees in the regions in order to comply with the agreement's provisions.





### PREPARATION FOR EMERGENCIES

Tailings dams and other Group facilities are designed to withstand the impact of earthquakes and extreme weather. In case of emergency, the operations have coordinated with the relevant public services and local authorities on emergency procedures and action plans. These include preventive

measures at operational level, such as the suspension of operations when recommended, and providing assistance for residents.

A key topic for discussion between Los Pelambres and the residents of Caimanes, which began at the end of 2015, was their demand for better information and increased participation in the design of these

emergency plans (+ see p. 41). In 2016, progress was made on updating the Emergency Manual for the Mauro dam and on the safety works. (+ see box



### PARTICIPATIVE DESIGN OF A CONTINGENCY PLAN

Los Pelambres had already initiated a dialogue with communities around the Mauro tailings dam when in September 2015 an earthquake measuring 8.4 on the Richter scale hit the area, its epicentre just 90 km from the dam. A few hours after the earthquake, the mine invited local leaders to personally inspect the dam wall and they were able to see it was undamaged.

In accordance with Chilean legislation, the dam had an operational emergency plan in place to care for its employees, residents and the environment. This plan is set out in the dam's emergency manual, approved by Sernageomin. However, the experience of the September 2015 earthquake reinforced the idea that a participative process was required in order to take into account the Caimanes residents' concerns and suggestions.

As a result of this dialogue between the community and Los Pelambres, in 2016 a Contingency Plan was designed for Caimanes which complements the emergency manual. The main points of this plan are:

- ▶ Setting a new safety zone in Caimanes and installing signage and lighting to improve access and the evacuation of the community to this zone in case of emergency.
- ▶ The installation of an audible alarm system to warn the community in case of an evacuation.

The above is supplemented with three containment works or gabion walls around the Pupío stream, also provided for in the Agreement.

The implementation of the Contingency Plan is progressing according to plan.

More information on the progress of the works can be found at <https://www.pelambres.cl/caimanes>



## COMMUNITIES

# CONFLICT MANAGEMENT

Being part of an area involves developing a relationship with the local communities and any other relevant institutions so as to be able to hear the legitimate concerns of all parties, get involved in local issues and work together to find solutions.

## OUR APPROACH

We are pursuing a new way of addressing both long-standing and newly-identified conflicts with communities using the framework of our principles of engagement - dialogue, collaboration, traceability, excellence and transparency.

### AGREEMENT WITH CAIMANES

When Los Pelambres began building the Mauro tailings dam, some 13 km from Caimanes, it faced opposition from local residents. This conflict continued for over a decade and involved lawsuits, roadblocks and other demonstrations. In May 2016, after nine months of talks, a historic agreement was approved by 84% of residents of the Caimanes communities and the rest of the Pupío valley.

The process to draw up and legitimise the agreement took place over 13 open meetings and a citizen consultation. All the meetings were recorded and published in full on the Chile Transparente and Los Pelambres websites. The citizen consultation was carried out before a notary public and with external observers.

The Caimanes Agreement was unprecedented and reflected the consensus reached on complying with the Supreme Court ruling on water from the Pupío stream, as well as on the other community claims regarding the safety of the dam and the development of the valley.

The Caimanes Agreement sets out measures aimed at:

- ▶ Ensuring a reliable water supply, in terms of quality and quantity, for human consumption and other activities.
- ▶ Increasing the reassurance to the community regarding the safety of the Mauro tailings dam.
- ▶ Producing programmes that help develop communities and families living in the Pupío valley.

### PROGRESS FROM THE AGREEMENT

A committee was established to implement the Agreement, with representatives from the community, Los Pelambres and Chile Transparente. The main progress during 2016 was:

- ▶ Designing the final plan for the agreement and commencement of works.
- ▶ Processing the relevant permits in order to execute the works for ensuring water quantity and quality.
- ▶ Drawing up a Contingency Plan for Caimanes with the community and the authorities, which supplements the emergency procedure for the tailings dam. In the last quarter of 2016, the first works began on the identification and preparation of a new safety zone and an alarm system.

[+ see p. 40](#)

- ▶ In February 2017 meetings were held with the communities of Caimanes, Pupío and Rincón in order to jointly devise a common vision for the development of the region and plan the initiatives that will help realise this vision. Similarly, the Family Development Fund has now been fully implemented in all three locations.

**LEGAL STATUS OF THE MAURO DAM**

In 2016, the two legal actions relating to the Caimanes claims were largely resolved. The first, regarding the safety of the dam, was resolved in June 2016, when the Supreme Court dismissed all of the appeals presented against Los Pelambres, confirming the decision of the La Serena Court of Appeal which had originally rejected the claim. It should be noted the Caimanes Agreement included further measures to guarantee people’s safety in case of an emergency. In the second case, which claimed the dam affected the flow and quality of the Pupío Stream, the Supreme Court declared inadmissible the appeals presented against the ruling of the La Serena Court of Appeal. Expert opinion concluded that there was no risk of contamination to surface or groundwater and accepted the works plan agreed between the company and the community in order to ensure the availability of water. The order to demolish the dam wall issued by a court of first instance in March 2015 was also dismissed.

**More background information** can be found in the 2015 Sustainability Report, p. 46.

No severe social incidents were reported in 2016.



## COMMUNITIES

# CONTRIBUTION TO LOCAL DEVELOPMENT

Contributing to the creation of economic, social and human capital in the areas where we operate is essential for the sustainability of our business. The Group maintains this commitment irrespective of the economic cycle.

## OUR APPROACH

Antofagasta Minerals seeks to be involved in the challenges involved in the development of the territories in which it operates and to contribute to the search for solutions via partnerships with other players, both public and private.

We promote local economic development by:

- ▶ Enabling local people to find quality jobs and business opportunities associated with our mining activities.
- ▶ Contributing to the initiatives arising from community engagement processes such as Somos Choapa, which address priorities shared by different stakeholders.



**2,312**  
**EMPLOYEES**  
LIVE IN THE REGION  
WHERE THEY WORK



**US\$377**  
**MILLION**  
IN PURCHASES  
FROM SUPPLIERS  
IN THE REGIONS OF  
ANTOFAGASTA AND  
COQUIMBO



**US\$24.3**  
**MILLION**  
IN COMMUNITY  
INVESTMENT  
PROJECTS AND  
PROGRAMMES\*

\* Does not include Zaldívar.



## EMPLOYMENT, SUPPLIERS AND ENTREPRENEURSHIP

Los Pelambres' sales were equivalent to 61% of exports from the Coquimbo Region in 2016 and the value added generated by the company is equivalent to 12% of GDP in the region. In the Antofagasta Region, Centinela and Antucoya together accounted for 9% of the Region's exports.<sup>1</sup>

**More information** on the creation and distribution of economic value can be found on p. 8.

The Group enables local people to find quality jobs, both in its operations and with its contractors. In 2016, the Group directly employed 2,312 residents of the regions of Antofagasta and Coquimbo, which amounts to 51% of its employees in those regions.

### LOCAL EMPLOYABILITY STRATEGY

As part of Somos Choapa, Los Pelambres has adopted a local employment strategy, designed to increase local access to jobs associated with its activities. Its implementation has created around 3,000 jobs for local people in two years. The strategy covers three areas: skills development, employment facilitation (using an employment website) and entrepreneur support.

In 2016, 96 of Los Pelambres' contractors reached the target of hiring a minimum of 30% of workers locally as promoted by the company. Over that period,

42% of the vacancies for jobs lasting more than three months and 51% of jobs for scheduled maintenance work were filled by Choapa Valley residents. In addition, 583 locals participated in vocational courses, enabling them to access employment opportunities created by the company's contractors and subcontractors.

Centinela's Second Concentrator project will recruit locals preferentially for the 9,000 workers required during its construction.

### TRAINING APPRENTICES

During the mine construction phase, the company implements apprenticeship programmes aimed at training mine operators and maintenance workers, preferably recruited locally. For instance, during 2016, Antucoya welcomed 24 apprentices from the Maria Elena and Mejillones communities to train them as mine operators and Centinela trained 60 persons from Antofagasta Region in its Apprenticeship Programme. Meanwhile, Los Pelambres trained 20 persons, all from the Choapa Valley, to operate trucks of high tonnage.

Zaldívar received special recognition from the National Training and Employment Agency for being one of the two companies with most young apprentices in the country. In 2016, 52 apprentices received certification after completing their training programme, which

provides young people with the necessary tools for their professional insertion.

Antofagasta Minerals participates in Mining Council initiatives aimed at improving the qualifications of workers in the industry. It also allocates financial and technical resources to support the development and skills of local people and communities by awarding grants to support their training for professional-technical careers.

### LOCAL SOURCING

In 2016, the mining operations made purchases of some US\$ 377 million from 735 suppliers in the regions of Antofagasta and Coquimbo, equivalent to 14% of total purchases and from 25% of the total number of suppliers.

In mid-2016, Centinela launched a pilot scheme for local sourcing in the Sierra Gorda community. The local services offers were matched to the needs of the operation, which enabled seven local suppliers to sign service agreements with the company and a mentoring programme was set up to foster their development.

**+ see p. 47**

The Group's two main mining operations have the ProPyme Stamp of approval from the Ministry of the Economy, which recognises companies that are committed to paying their SME suppliers within a maximum period of 30 calendar days. Both companies are also involved in the Corfo World-class Supplier

Development Programme aimed at strengthening innovation and supporting the internationalisation of national companies that supply the mining sector.

### SUPPORT FOR FARMERS AND FISHERMEN

The Los Pelambres and its Foundation give technical support to small-scale farmers in the Coquimbo Region in the implementation of modern irrigation programmes. They also encourage collaborative projects aimed at improving the marketability of local products. Los Pelambres also works with artisan fishermen in Los Vilos, supporting the research, protection and development of the areas where they operate.

<sup>1</sup> The value added generated by Los Pelambres in relation to GDP in the Antofagasta region was calculated using 2015 data. Zaldívar was not included, according to IFRS 10 (International Financial Reporting Standards) for Consolidated Financial Statements.

### CONTRIBUTION ARISING FROM DIALOGUE

In 2016, work was done to reinforce the shift of focus in community investment, promoting initiatives arising from dialogue with the community and applying the Somos Choapa principles. Progress was made on the development of indicators for assessing the effectiveness of community projects and programmes, and their contribution to the development of the region. The methodology used is linked to the UN Sustainable Development Goals.

#### SOMOS CHOAPA PROJECT PORTFOLIO

This series of projects and programmes for economic, social and environmental development, funded in conjunction with the public sector, is the result of the first two years of the Somos Choapa process.

In 2016, 11 public works were launched: cultural and sports centres, improved roadworks and playgrounds, as well as sanitation and drinking water projects in Illapel, Salamanca and Canela.

Preliminary studies, invitations to tender and construction work have begun on 16 other projects, and entrepreneur support programmes were developed in Illapel and Canela.

In Los Vilos, five new playgrounds were opened and a citizen participation process launched to identify key community expectations and define ways of addressing them.

**More information** on the details and progress of the project can be found at [www.somoschoapa.cl](http://www.somoschoapa.cl)

## SOMOS CHOAPA: SUSTAINABLE PROVINCE



### CANELA ENTREPRENEURS

The Canela Entrepreneurs programme was implemented to improve the skills and abilities of entrepreneurs and micro-entrepreneurs, to promote their initiatives and businesses and contribute to the economic and social development of the community.

The programme was launched through an outreach initiative with the local council. 166 entrepreneurs from Canela –118 of them women– presented business ideas, 60 of which were selected and awarded funds of between US\$1,000 to US\$1,500 each.



### THE POLÍGONO COMMUNITY SPORTS CENTRE

The Somos Choapa portfolio of projects includes a network of community sports centres whose purpose is to provide local people with spaces for playing sports, encouraging opportunities for community cooperation and for bringing people together.

This portfolio includes the construction and fitting out of the El Polígono CDC, located in Illapel, which is expected to be completed in April 2017.



### OPENING PLAYGROUNDS IN LOS VILOS

In 2016, an open engagement process was launched by Los Pelambres, the community and the local council, to enable the development of a shared vision for Los Vilos.

More than 200 people participated in the initial talks and five new playgrounds were designed and built as a joint effort in vulnerable Los Vilos neighbourhoods.



### INAUGURATION OF CASA VIVA

Casa Viva, located in the main square of Salamanca, acts as the main meeting point for the local Viva Salamanca programme. This centre provides information on the programme and is also used by social organisations, hosted by the programme, for their meetings.

This new space has enabled a cycle of open discussions, which seek to respond to questions and comments that the people of Salamanca may have regarding the programme, in addition to providing a space for round table meetings.

## ANTOFAGASTA PLAN

In 2016, the Group advanced an initiative known as the Antofagasta Plan that was based on the engagement process principles and the common interests of its three operations in the Antofagasta Region. A series of programmes and projects are being developed to strengthen their relationships with the residents of the Region and with the communities in the areas directly influenced by their operations.

Social investment was focused on improving the quality of life of the inhabitants of the city of Antofagasta. Through the Creo Antofagasta public-private

platform, the Group supported the Antofagasta on a Bike initiative by encouraging the use of bicycles as public transport and promoting the interaction of inhabitants with public spaces, and submitting a plan for the creation of 22 kilometres of high-quality urban cycle paths to the regional government.

In terms of higher education, support was given to several initiatives including the creation of a postgraduate course for PhD students in mineral process engineering at the Universidad de Antofagasta and an updated seminar at the Universidad Católica del Norte for regional journalists.

In addition, within the areas of direct influence, dialogue was begun with the communities living in the area of West Calama to listen to their concerns and define community development projects together, reinforcing trust between the parties.

Centinela signed two important collaborative agreements with the Sierra Gorda Regional Council including grants in support of technical and professional education, a transport system for local students attending secondary schools in the city of Calama and a local sourcing programme.



## ANTOFAGASTA ON A BIKE

After a process of collaboration and dialogue, and with the aim of promoting the building of cycle paths in the regional capital, the Group has contributed to the Antofagasta by Bike project through the public-private platform Creo Antofagasta.

The Mining Group has contributed to the development of cycle routes aimed at encouraging the use of bicycles as a means of transport and promoting the interaction of inhabitants with public spaces, in addition to supporting this initiative the Group has submitted a plan to the regional government for the creation of 22 kilometres of high-quality, urban cycle paths.



## DIALOGUE FOR DEVELOPMENT

This initiative is based on the Group's engagement process, whereby the actions and projects to be carried out with the communities are the product of joint efforts. This results from a process of participation and dialogue, which makes the community a key player in determining the initiatives to be implemented in the region.

In the first stage of the talks and agreements, the aim is to seek to enable the members of social organisations to express their needs, interests, strengths and vision of the future, while striving to preserve the identity of each sector.



## LOCAL SOURCING PROGRAMME

In mid-2016, Centinela launched the pilot scheme for the Local Sourcing Programme with the Sierra Gorda community aimed at maximising the opportunities for using suppliers in the Sierra Gorda area.

Suppliers of local services were matched to the needs of the company, which enabled seven local suppliers to sign service agreements with the company. Centinela also put in place a mentoring programme to foster their development.



# COMMITTED TO THE ENVIRONMENT

The Group aims for responsible and balanced management of its operating areas, and is constantly aware that its activities can affect the environment. At all stages of the development of a mine, from exploration to closure, we try and prevent any potential environmental impact and, when this is not possible, we seek to mitigate the impact or provide compensation.

## OUR APPROACH

The Group's environmental management is regulated by the Chilean environmental law and specific mining regulations. In addition, it complies with ICMM principles, international best practice and the guidelines set out in ISO 14001.

The Group's environmental management priorities are:

- ▶ Compliance with all commitments contained in its Environmental Approval Resolution (RCA)<sup>1</sup>.
- ▶ Ensuring that critical controls for key environmental risks are in place.
- ▶ Early identification of the main environmental issues affecting development projects and ensuring the quality of their environmental impact assessments.
- ▶ Defining appropriate strategies to mitigate climate change, protect biodiversity and ensure the correct closure of mines.

The Group has specific standards for managing environmental factors, including climate change, biodiversity and the closure of mining operations..



## 0 INCIDENTS

IN 2016 NONE OF THE GROUP'S OPERATIONS HAD AN OPERATING INCIDENT WITH SIGNIFICANT ENVIRONMENTAL IMPACT. THE LAST SUCH INCIDENT OCCURRED IN 2011.

<sup>1</sup> The Environmental Approval Resolution (RCA) contains specific, legally-enforceable commitments, whose compliance is a condition of the environmental approval of a project granted by the Chilean Environmental Assessment Service.



## ENVIRONMENTAL CONTEXT

The Group's operations are located in two areas with very different geographical characteristics. Los Pelambres is located at the head of the Choapa Valley in the Coquimbo region, traditionally an area of agriculture and raising livestock. Its climate is Mediterranean in the valley and high-altitude climate at the mine site. The main environmental challenges are water scarcity, particulate matter in the air and potential impacts on biodiversity and archaeology. Centinela, Antucoya and Zaldívar are located in the Atacama Desert, one of the driest regions on earth, and face the particular challenges of an extreme and arid climate

### LEGAL FRAMEWORK

The Environmental Framework Law is the key instrument for environmental regulation in Chile.

The main institutions involved are the Ministry of the Environment, which defines public policy on environmental issues, the Environmental Assessment Service, which assesses and rates project impact, the Environmental Superintendence, which conducts audits and imposes sanctions, and the Environmental Courts.

The law stipulates that mining projects must be assessed by the Environmental Assessment Service, which can authorise or reject their construction and operation. As part of this process, they canvass opinions from the relevant government agencies and, where appropriate, from neighbouring communities. Any approved project must comply with a set of commitments aimed at preventing, mitigating or compensating for any environmental impact it may

have. Compliance with these commitments, contained in the Environmental Assessment Resolution (RCA) of each approved project, is monitored by the Environmental Superintendence and is legally binding.

In 2016, new legislations were enacted that directly affect the mining industry, including Law No. 20,920 regarding waste management, extended producer responsibility and recycling. Furthermore, new regulatory standards relate to the storage of hazardous substances and reporting of environmental incidents. Parliamentary debate is under way regarding water ownership, glacier protection and the transport and storage of concentrates.

**COMPLIANCE**

Antofagasta Minerals aims for full implementation of the required critical controls for key environmental risks and for full compliance of its commitments in its RCAs. Regarding the latter, during 2016 the Group developed a new system for monitoring environmental commitments, which includes an early warning system for the detection of potential non-compliance.

**INCIDENTS AND FINES**

There were no spills or any other operational incidents with significant environmental impact in 2016.

In 2016, the Group’s operations were reviewed by the Environmental Superintendence, the Geology and Mining Agency (Sernageomin<sup>1</sup>), the Water Agency (DGA) and the Health Service, among others, for compliance with environmental regulations. Of the 53 audits, none led to fines or penalties in environmental matters. In October 2016, the Superintendence filed charges against Los Pelambres for matters detected in audits carried out in 2014 and 2015. The company presented a compliance programme to correct these findings, which is currently awaiting approval by the authority before it can be implemented.

**PROJECTS’ ENVIRONMENTAL ASPECTS**

During 2016, progress was made on two important projects at Centinela, which

will begin operating in 2017: the Molybdenum Plant and the Encuentro Oxides project. Both projects must comply with commitments in their respective RCAs during the construction phase, as well as meet the Group’s own environmental standards, to align them with the new environmental management programme that is being implemented in 2017.

**PROJECTS UNDER ENVIRONMENTAL REVIEW**

The Los Pelambres Incremental Expansion Project will maintain copper production capacity by increasing milling capacity and ensuring the water supply during drought with the construction of a desalination plant.

The most relevant issues for environmental review are related to water, biodiversity and archaeology. The company has developed a process of engagement with nearby communities through which the main aspects of the project have been presented and the opinions of all stakeholders obtained.

**+ see p. 52**

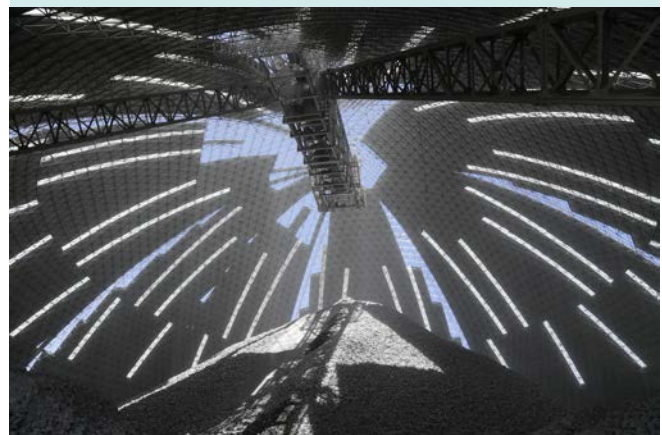
**PROJECTS WITH ENVIRONMENTAL PERMITS**

The Centinela Mining District project obtained environmental approval in 2016 (RCA N° 436/2016). The main environmental issues on this project are related to particulate matter and its impact on the community of Sierra Gorda, and with potential archaeological and paleontological findings.

**INNOVATION IN ENVIRONMENTAL MANAGEMENT**

During 2016, the search continued for innovations to improve the management of tailings, the treatment of acidic water, the control of particulate matter and the recycling of tyres.

**+ see p. 65**



<sup>1</sup> The National Geology and Mining Service is the state agency that regulates geological and mining issues and is responsible for authorising mine closure plans in Chile.

## WATER

# EFFICIENCY AND USE OF SEAWATER

Water scarcity remains a major challenge for mining operations and a key factor in their relationship with local communities. In view of this, the Group uses seawater in two of its operations and prioritises the efficient use of water in all four of them.

## OUR APPROACH

Water management priorities are:

- ▶ Responsible sourcing
- ▶ Efficient usage
- ▶ Pollution prevention

All operations have water management plans based on water balances, as well as water quality and quantity targets.

The Group reports its water footprint –the level of consumption per water source– through the Carbon Disclosure Project (CDP) water programme methodology.

## CONTEXT

Over the last decade, the effects of climate change have caused a structural deficit in water resources in some regions of Chile with water shortages in several areas, which have led to conflicts among users.

## OPERATING CONTEXT

Antofagasta Minerals has been aware of water scarcity since it began operating and has always used this resource carefully. Michilla incorporated the use of seawater into its processes in 1992, followed by Centinela in 2010 and Antucoya in 2015, and the efficient use of water is a constant concern.





### SEAWATER

Centinela's expansion project will also operate with seawater, as will the Los Pelambres Incremental Expansion project, although in this case a desalination plant will be built as backup to allow operations to continue unaffected during periods of drought.

### EFFICIENCY

The Group reuses the water from its processes to reduce the use of make-up water. The reuse rate is between 71% and 94%, depending on the characteristics of each operation.

In 2016, the Group consumed a total of 55 million m<sup>3</sup> of water. This was an increase on the previous year's consumption due to the incorporation of Zaldivar and Antucoya. Seawater made up 48% of the total water consumed,

while the remaining 52% was continental water.

Los Pelambres is the Group's main user of continental water and has environmental authorisation to use 829 l/s. In 2016, efforts were redoubled, in co-operation with local authorities, communities and central government, in the search for long-term solutions to the water challenges in Choapa province. [+ see p. 41](#)

## WATER SOURCING

In thousands of m<sup>3</sup>

	2014	2015	2016 <sup>1</sup>
<b>CONTINENTAL WATER</b>			
Surface water	16,628	14,624	14,034
Groundwater	8,397	8,568	13,481
Water supplied by third parties	1,737	1,482	1,192
<b>SEAWATER</b>			
Seawater	20,682	20,573	26,554
<b>TOTAL</b>	<b>47,444</b>	<b>45,247</b>	<b>55,261</b>



**48%**  
**OF THE WATER**  
**USED IN 2016**  
**THE GROUP CAME**  
**FROM THE SEA**

<sup>1</sup> The 2016 figures include the Antucoya and Zaldívar operations for the first time.

## WATER QUALITY

The Group has zero water discharge, with none of its operations discharging water out of any of their facilities.

Water quality is continuously monitored and inspected by the relevant authorities. Los Pelambres performs checks at 160 points and publishes the results of the most relevant monitoring stations on its website.

The community participates in water monitoring activities (+ see p. 39), and seawater quality is monitored in Los Pelambres' port as well as at the port that serves the Antucoya and Centinela operations.



## NEW SOLUTIONS FOR THE TREATMENT OF ACIDIC WATER

In 2016, an innovative project was carried out in collaboration with the University of Chile to improve the treatment of acidic water at the Los Pelambres mine dumps by analysing the feasibility of different technologies and treatment systems. The role of a natural wetland was studied in the treatment of acidic water, and an adsorbent substrate was synthesised which would remove sulphates and other pollutants present in the water. The aim is to develop a comprehensive acidic water treatment system which is sustainable in the long term.

More information on water management and engagement with the community can be found on p. 41.

# DECOUPLING GROWTH FROM EMISSIONS

Chile is vulnerable to climate change, as can be seen from the higher temperatures and decreased precipitation in the north and centre of the country. In this context, Antofagasta Minerals has created a standard and a climate change strategy, and is sourcing non-conventional renewable energy for its operations.

## OUR APPROACH

In 2016, Antofagasta Minerals approved the Climate Change Standard, with several important aims to:

- ▶ Identify risks and opportunities associated with climate change at each operation.
- ▶ Promote innovation in energy efficiency and the use of clean energy in the Group's operations and projects.
- ▶ Mitigate greenhouse gas emissions.
- ▶ Measure and report results.

The Group has measured and publicly reported its carbon emissions to the Carbon Disclosure Project (CDP)<sup>1</sup> since 2009.

### CONTEXT

Chile contributes 0.2% of global carbon emissions. In 2016, the country ratified the Paris Agreement, launching a sustainable energy strategy<sup>2</sup> that committed the country to achieving a 30% reduction in its carbon dioxide (CO<sub>2</sub>) emissions intensity. As part of this commitment 100% of major consumers, including the mining

industry, must make efficient use of energy by the year 2035 and 70% of electricity will come from renewable sources by 2050.

In 2016, the government defined which companies will be subject to the new tax on the emission of pollutants from stationary sources. This will not directly affect mining companies.

### OPERATING CONTEXT

The Group's energy consumption and CO<sub>2</sub> emissions will continue to increase due to the lower ore grade, the increased hardness of the rock, the ageing of the mine (which means digging to a greater depth and transporting loads further) and the decision to use seawater.<sup>3</sup>

<sup>1</sup> The Carbon Disclosure Project is a leading international organisation that monitors and publishes companies' carbon and water footprints. Find more information at [www.cdp.net](http://www.cdp.net)

<sup>2</sup> [www.energia.gob.cl/sites/default/files/hoja\\_de\\_ruta\\_cc\\_e2050.pdf](http://www.energia.gob.cl/sites/default/files/hoja_de_ruta_cc_e2050.pdf)

<sup>3</sup> Pumping water from the coast to the operations increases the consumption of electricity provided by the Northern Grid (SING)

The main challenge for Antofagasta Minerals is to keep growing without proportionally increasing its emissions. It is therefore focused on looking for opportunities to reduce its emissions, both in electricity supply sources and in its own operations, as well as incorporating energy efficiency criteria from the start of its new mining projects.

**RENEWABLE ENERGY**

72% of the Group’s CO<sub>2</sub> emissions relate to electricity consumption, so its priority is to diversify its electricity supply based on renewable energy sources.

**+ see box**

In 2016, 17% of total energy consumption was generated by renewable sources, up from 5% in the previous year.

All operations have long-term electricity supply contracts, so efforts must be focused on reducing emissions by replacing the use of diesel with more economical and sustainable fuel sources. For instance, some of the Group’s operations are converting to natural gas for heating solutions in the SX-EW plants.

**ALTO MAIPO HYDROELECTRIC POWER PROJECT**

In January 2017, Los Pelambres completed the sale of its 40% interest in the Alto Maipo hydroelectric project. With this sale, the company and Antofagasta Minerals have relinquished all ownership of this project, as it no longer part of the Mining Group’s strategy. An agreement was reached to modify the existing long-term contract for the purchase of energy from Alto Maipo.



**42%**  
**OF THE POWER**  
**CONSUMED**  
**BY LOS**  
**PELAMBRÉS IN**  
**2016**  
**CAME FROM**  
**RENEWABLE**  
**SOURCES**





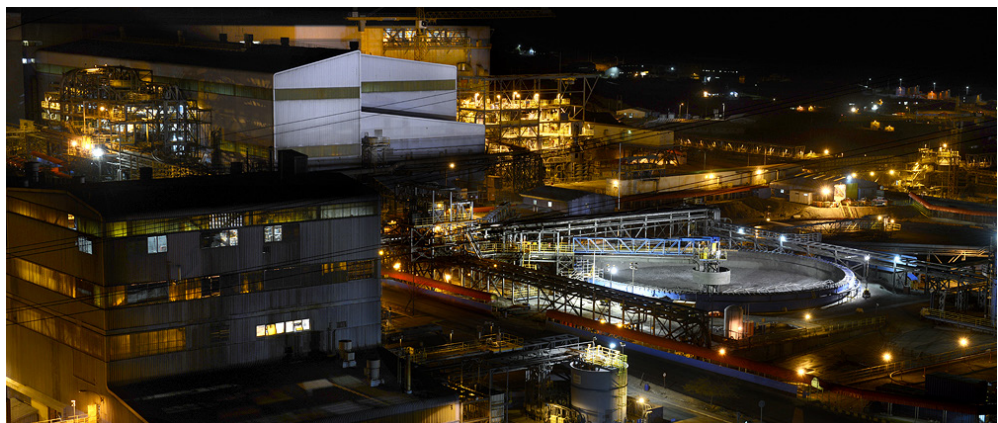


## GENERATION OF ENERGY FROM RENEWABLE SOURCES

Increasing renewable energy use is part of Antofagasta Minerals' climate change strategy. Los Pelambres has set a target of 80% of its total energy consumption to be from renewable sources by the year 2019, and in order to achieve this supply agreements have been signed with:

- ▶ El Arrayán Wind Farm, operating since 2014 (in which the company has a 30% interest).
- ▶ Javiera Photovoltaic Power Station, operating since 2015.
- ▶ Conejo Photovoltaic Power Station, commissioned in October 2016.

Following the commissioning of Conejo in 2016, 42% of the electricity used by Los Pelambres comes from non-conventional renewable energy sources, making it the leading mining company in Chile in this field.



## GREENHOUSE GASES

The Climate Change Standard guides the implementation of initiatives to mitigate emissions from all operations and future mining projects. In order to do this, using the abatement curve methodology, critical activities are identified to devise technically and economically viable reduction projects.

Antofagasta's emissions have been rising steadily, mainly due to two new operations in the Group's portfolio. In 2016, total emissions reached 2.8 million tonnes of CO<sub>2</sub>, a higher figure from previous year. The intensity of emissions increased by 13%. The increase was due to the commissioning of Antucoya and the acquisition of Zaldívar.

### GREENHOUSE GAS EMISSIONS (GHG)<sup>1</sup>

Equivalent tonnes of CO<sub>2</sub>

	2014	2015	2016 <sup>2</sup>
<b>Scope 1</b> Mainly diesel for trucks and mine equipment	593,915	578,118	795,994
<b>Scope 2</b> Mainly mine plant energy consumption and pumping seawater	1,505,997	1,412,760	2,000,010
<b>Total emissions</b>	<b>2,099,912</b>	<b>1,990,878</b>	<b>2,796,004</b>
Intensity of CO <sub>2</sub> emissions (tonne CO <sub>2</sub> e/tonne CuF)	2.98	3.24	3.67

<sup>1</sup> Antofagasta Minerals' GHG emissions inventory for the years 2012 to 2016 was verified by an audit firm recognised by CDP.

<sup>2</sup> The 2016 figures include Antucoya and Zaldívar. Michilla was included up until 2015. These figures include 100% of Zaldívar's emissions, even though Antofagasta plc has only a 50% stake in the company.

# ENERGY EFFICIENCY

The company is constantly striving for greater energy efficiency and to using more renewable energy sources in order to reduce environmental emissions.

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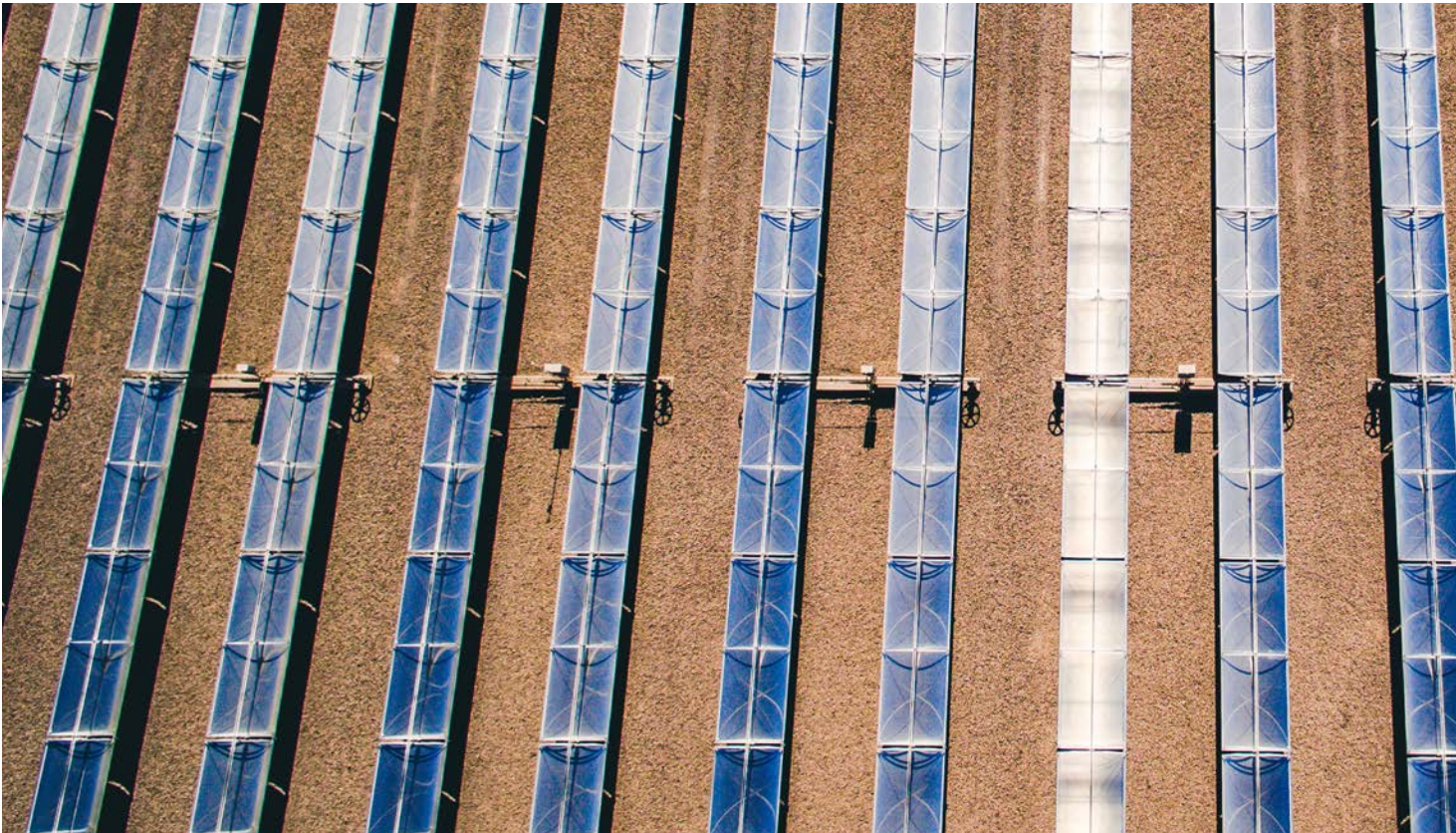
## OUR APPROACH

Energy efficiency at Antofagasta Minerals is a company-wide priority and is a key factor in the Cost and Competitiveness Programme, which encourages innovation and operating excellence.

The Group's Climate Change Standard focuses on the efficient use of energy at all of its operations and projects. It also has an Energy Efficiency Programme, which was rolled out in 2014.

## CONTEXT

One of the main challenges involved in the development of Chile is efficient energy use. In May 2014, the Ministry of Energy published the Government Energy Agenda, a roadmap for the challenges over the following 10-years. In July of the same year, in view of the role of major mining operations in the



country’s energy consumption, the Mining Council –to which Antofagasta Minerals belongs– and the Ministry of Energy agreed to collaborate on promoting the efficient use of energy resources by member companies, conducting audits and submitting specific plans for the implementation of initiatives.

**OPERATING CONTEXT**

Energy efficiency is also highly relevant in terms of costs and therefore the Group’s profitability, as electricity and fuel account for some 15% of the Group’s cash costs.

**ENERGY EFFICIENCY**

Energy efficiency is a key component of the Group’s corporate competitiveness and costs, and innovation and operating excellence programmes.

Antofagasta Minerals’ Energy Efficiency Plan has the following objectives:

- ▶ Conduct external energy audits, to define benchmark KPIs and identify relevant initiatives.
- ▶ Establish a portfolio of initiatives for the short, medium and long term.
- ▶ Incorporate energy efficiency in the assessment and design of mining projects.
- ▶ Establish a corporate energy efficiency management system.

From 2015 to 2016, energy audits were conducted on all of the Group’s operations, which identified energy efficiency initiatives. These were prioritised and execution plans devised for implementation in the short,

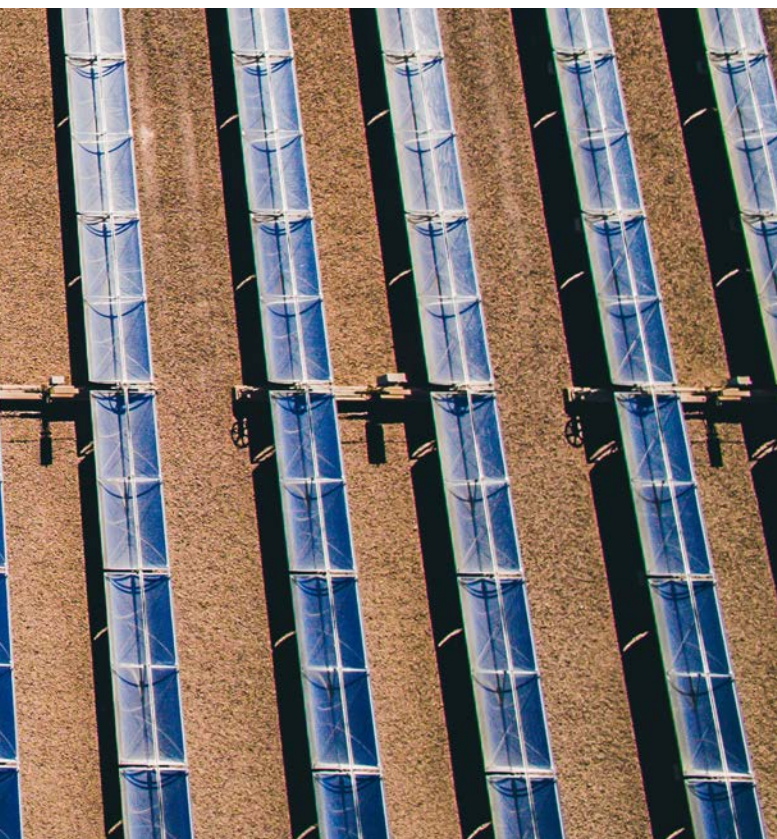
medium and long term. These initiatives will enable savings in the use of electrical energy and fuel, bringing additional benefits in terms of safety, reduction of GHG emissions and production.

The innovation programme was reviewed and redefined in 2016 and an Innovation Committee was appointed to assess potential initiatives, prioritise them and approve the budget for their early development stages. This Committee has identified several initiatives that have fed into the energy efficiency project portfolio, which are currently undergoing technical and economic analysis.

In December 2016, a new energy management system, in line with ISO 50001 on energy efficiency, was approved for the whole Group. An Energy Efficiency Committee was created,

comprising the Vice Presidents of Operations, Projects and Corporate Affairs, and the Group’s Energy Manager. They will supply guidelines, review and validate the plan for implementing the energy management system and approve the identified efficiency initiatives.

In 2016, the Group’s total electricity consumption was 3.2 million MWh and it consumed 253,000 m³ of fuel. Overall consumption increased due to the inclusion of Antucoya and Zaldívar into the Mining Group for the first time.



**GROUP ENERGY CONSUMPTION**

	2014	2015	2016
Energy (MWh)	2,593,118	2,519,940	3,205,126
Fuel (m³)	195,538	197,612	253,142



# AIR QUALITY MANAGEMENT

Mining generates particulate matter emissions that stick to airborne dust generated by natural causes. Maintaining air quality is key to protecting the health of workers and local communities.

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## OUR APPROACH

Antofagasta Minerals takes a preventive approach to particulate matter emissions, using weather forecasts and emissions predictions to help focus operating controls, which range from wetting roads, covering conveyor belts and stockpiles to, when necessary, rescheduling mining activities.

### CONTEXT

All of the operations monitor air quality in their camps and in nearby communities. This is a particular issue for Los Pelambres and Centinela, which are located close to populated areas, and both operations have an early warning system to prevent critical air quality events caused by adverse weather conditions.

Antofagasta Minerals is constantly seeking new solutions for maintaining emissions levels below the limits set in the standard on particulate matter.

### PREVENTION AND WARNING

The operations have adopted various operating measures to reduce their particulate matter emissions. Los Pelambres, for example, uses mist canons and road-wetting to reduce dust levels in the mine area and together with Centinela, it also uses moistening foam and sprinklers in the plant, on stockpiles and on conveyor belts.

Both Los Pelambres and Centinela have developed predictive models to anticipate weather phenomena

that, when combined with certain operating conditions, might affect air quality. Measures can then be taken to prevent higher concentrations of particulate matter in the air, for example, if strong winds are forecast, activities involving explosives at the mine can be rescheduled.



### COLLABORATIVE EFFORT

Due to distance, wind and topography, particulate matter emitted by Centinela does not significantly affect the town of Sierra Gorda. But in response to a gradual deterioration in the community's air quality, a public-private working group was set up to address the problem. This is led by the local council and includes the Health Agency, the Ministry of the Environment and the four mining companies operating in the area.

In 2016, the Sierra Gorda Air Quality Study framework made

progress in identifying emission sources, proposing additional or alternative mitigation techniques, assessing measures to be implemented by the companies to reduce emissions and informing the community of the results.

Air quality is measured in terms of the concentration of particulate matter at monitoring points jointly agreed with the authority. In 2016, emissions remained below the maximum level permitted for air quality in residential areas. At Los Pelambres, the community will continue to participate in monitoring. [+ see p. 39](#)

### AIR QUALITY

Average annual concentration of PM10 micrograms per m<sup>3</sup>N

	2014	2015	2016
Los Pelambres	46	37	35
Centinela	39	40	34
Antucoya*	n/a	n/a	n/a
Zaldívar			97

\* Not available, as Antucoya has no stations that are representative of the population.



# INNOVATION IN TAILINGS MANAGEMENT

Antofagasta Minerals manages its tailing and waste dumps to the highest safety standards and will continue to implement secure, innovative and efficient solutions for disposing of its mining waste, both during mining operations and after closure.

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## OUR APPROACH

The Group's commitment to the responsible management of its mining waste exceeds legal requirements. In 2016, the ICMM issued a new standard for tailing dams and for the prevention of catastrophes,<sup>1</sup> to which the Group adheres and is committed to implementing at its operations.

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<sup>1</sup> The complete document "Position statement on preventing catastrophic failure of tailings storage facilities" can be found at: [https://www.icmm.com/website/publications/pdfs/position-statements/161205\\_icmm-position-statement\\_tailings-governance.pdf](https://www.icmm.com/website/publications/pdfs/position-statements/161205_icmm-position-statement_tailings-governance.pdf)



## CONTEXT

Every process used to separate minerals from rock produces considerable quantities of mining waste, deposited in sterile material dumps, and spent ore and tailings storage facilities. Tailings from copper mines are transported to purpose-built facilities.

Chilean legislation sets specific conditions in which the construction of tailings dams and storage facilities can be undertaken. These regulations determine the facilities' design and apply both during their operation and after closure. Compliance is monitored regularly by the relevant authorities.

Chile has the third largest number of tailings storage facilities in the world, and the volume of tailings produced could double over the next 20 years.<sup>1</sup>

## OPERATING CONTEXT

Because of their mineral extraction processes, Antucoya, Centinela Cathodes and Zaldívar's mining waste is spent ore, while Los Pelambres and Centinela Concentrates have tailings. All require sterile material dumps.

At Los Pelambres, due to the complex geography and size of the operation, the challenge facing the Group is to maintain the physical and chemical stability of the tailings storage facilities. The Quillayes tailings dam is a backup for emergency situations and the Mauro dam, in the Pupío Valley, has a capacity of 1.7 billion tonnes.



<sup>1</sup> Taken from the study: "Mining – A Platform for the Future for Chile".





## TAILINGS STORAGE FACILITIES

Physical and chemical stability are two key concerns when designing and commissioning any tailings storage facility, which will contain water and tailings composed of materials such as fine sand, silt and clay.

### PREVENTING POLLUTION

Ensuring the chemical stability of mining waste involves separating natural water from process water. The tailings facilities at Quillayes, Mauro and thickened tailings at Centinela were designed to divert natural water before it encounters the waste. The water can then be channeled to a point below the dam's retaining wall. The quantity and quality of the water that is returned to the natural watercourse is defined in the dam's operating regulations and is inspected by the Water Agency and is also monitored by the community.

### EMERGENCY PREPAREDNESS

It is absolutely essential for local communities to have contingency plans in place in case of possible emergencies and disasters involving tailings storage facilities.

[+ see p. 40](#)

### INNOVATION IN TAILINGS

The Group pioneered the use of thickened tailings technology on a large scale at Centinela. This uses water more efficiently and creates more stable tailings deposits that require less space. Its implementation posed several challenges, not least of which was achieving the required levels of thickness. The lessons learnt were then incorporated into Centinela's Second Concentrator project, which will increase the capacity of the facility from 700 to 2,600 million tonnes of tailings, extending the life of Centinela until 2056.

## ONLINE MONITORING OF TAILINGS DAMS

Antofagasta Minerals participates in a technology programme for the online monitoring of tailings storage facilities. This is organised by the Chile Foundation and participants include the public and private sectors as well as research bodies.

The programme seeks to develop an online monitoring system to improve the management of tailings dams and reduce the risk perception while improving communication with local communities. It involves the use of innovative technology to measure the facilities' physical and chemical stability, thus providing real-time, quality information to different users. With this in mind, a pilot project is planned for the Mauro dam.

In 2016, the Group generated more mining waste than in 2015, mainly due to the commissioning of Antucoya and the acquisition of Zaldívar.

### NON-MINING WASTE

Mining processes generate hazardous and non-hazardous waste. The former, mainly oil and used batteries, is stored according to regulations for disposal or recycling. Examples of non-hazardous waste include mud, wood, high-density propylene sheets and tyres, all of whose management is standardised.

The recycling of reusable waste such as scrap metal, wood and cardboard is encouraged at all of the operations.

### MINING WASTE

Million of tonnes

	2014	2015	2016
Waste rock	236	196	252
Tailings	92	90	89
Spent ore	19	15	30

### NON-MINING WASTE

Tonnes

	2014	2015	2016
<b>INDUSTRIAL</b>			
Hazardous	6,487	6,643	6,968
Non-Hazardous	32,838	38,930	35,821
<b>DOMESTIC</b>			
	4,542	4,263	4,493

### WASTE MANAGEMENT

Tonnes

	2014	2015	2016
Recycled	22,895	32,155	28,027
Reused	3,156	3,371	3,883
Composted	76	67	67
Incinerated	261	0	0
Recycling rate	60%	71%	68%

# PRESERVING OUR NATURAL WEALTH

Chilean law and international good practice embrace the growing importance of protecting ecosystems, biodiversity and archaeological heritage.

Antofagasta Minerals works to prevent, mitigate and compensate its impact and actively seeks to preserve and promote natural and cultural heritage in its operating areas.

## OUR APPROACH

The Group's efforts to protect biodiversity and heritage are focused on Los Pelambres' area of operation, which contains endemic species and ecosystems requiring special protection.

The 2016 Biodiversity Standard was developed in conjunction with the Wildlife Conservation Society (WCS)<sup>1</sup> and took into account the ICMM's position statement on Protected Areas. It has three goals:

- ▶ To avoid and minimise impact on biodiversity.
- ▶ To appropriately restore or compensate for any impact on biodiversity.
- ▶ To generate additional benefits for the environment.



**WE CONSERVE OVER  
25,000 Ha  
OF ECOSYSTEMS  
OF HIGH ENVIRONMENTAL VALUE**

## CONTEXT

The definition of biodiversity, according to the Convention on Biological Diversity<sup>2</sup>, is the variability of living organisms from all sources, including land, marine and other aquatic ecosystems, and the ecological complexes to which they belong. This includes diversity within species (genetic diversity), diversity among species, and diversity of different ecosystems.

Key values for the management of biodiversity are divided into three categories:

- ▶ Ecological value is indicated by two factors: threat level (vulnerability and/ or irreplaceability) and the importance of a particular component for its habitat.
- ▶ Usage value is related to biodiversity components used by human beings (for

<sup>1</sup> The Wildlife Conservation Society is a worldwide foundation which has been promoting the protection of biodiversity since 1948.

<sup>2</sup> You can find more information about the organisation at [www.cbd.int/](http://www.cbd.int/)



subsistence or commercial purposes, including tourism).

- ▶ Cultural value: the valuation given by a human group with regard to their personal values, traditions and identity, among other things.

## OPERATING CONTEXT

The Coquimbo Region, where Los Pelambres is located, is within the top 25 areas in the world with the greatest plant biodiversity and the Choapa Valley is renowned not only for its flora and fauna but for its blocks of stone with petroglyphs cave paintings described by anthropologists and archaeologists as “an extensive outdoor art gallery”.

The operations located in the desert (Centinela, Antucoya and Zaldívar) face biodiversity challenges related the protection of local fauna, birdlife and vegetation.

The new standard requires all of the Group's operations to review the existence of biodiversity components (species and ecosystems) in order to avoid significant impact, and, where

this is impossible, to minimise or compensate for it.

Progress has been made in collating information in order to set guidelines for implementing the standard at the operations from 2016. At Los Pelambres, work was undertaken to identify biodiversity areas potentially affected by the current operations within the Biodiversity Standard framework. Meanwhile the key values at each operation will be reviewed in 2017.

## BIODIVERSITY IN THE OPERATIONS

High-value protected ecosystems include world heritage sites, threatened or degraded ecosystems, legally-protected areas, biosphere reserves and Ramsar wetlands. Antofagasta Minerals has no operations in areas with ecosystems of high ecological value. However, in the area around Los Pelambres there are a number of sites particularly rich in biodiversity, and which the company has sought to protect:

- ▶ **Conchalí Laguna wetland:** this coastal site was restored by Los Pelambres and

became a nature sanctuary in 2000, and is now included on the world list of Ramsar sites.<sup>3</sup>

- ▶ **Sclerophyll forests:** these contain rare Chilean palm trees and a hydrophilic forest located in Monte Aranda, sclerophyll forests (canelo, chequén) in Llau-Llau ravine and sclerophyll forests in Talca ravine.
- ▶ **High Andean wetlands:** in the Manque Valley, in Los Piuquenes and El Pelado lagoon.

Antofagasta Minerals is also focused on protecting marine biodiversity around the port facilities at Punta Chungo and Los Vilos and by the quay at Caleta Michilla.

## CULTURAL HERITAGE

In some areas, archaeological evidence of the area's first inhabitants and historical mining works have been found, in addition to the cultural heritage and traditions of local people. The Group respects and helps to preserve this heritage.

In 2014, Los Pelambres opened the Rural Culture Exhibition Hall in Monte Aranda, seeking to preserve the customs and stories of traditional rural cultures and share them with the community. In 2015, it opened the Archeological Rock Park, 25 hectares of land criss-crossed by 3,700 metres of trails, where you can see an exhibition on stones with petroglyphs produced by the ancient Diaguita people who once lived in the Mauro Valley.

In the Antofagasta Region, the operations participate in initiatives to conserve and reclaim cultural heritage by supporting organisations such as Gaviotín Chico Foundation, PROA, PROLOA and Chacabuco Saltpetre Office Foundation. They also support initiatives and publications dedicated to preserving regional memories.

<sup>3</sup> The Ramsar Convention protects wetlands around the world. More information can be found at [www.ramsar.org](http://www.ramsar.org)

# PLANNED MINE CLOSURE

Due to its extensive mining history, there is particular concern in Chile about the unplanned abandonment of mining operations. The Group's commitment as owners goes beyond legal compliance, from the exploration phase to mine closure.

## OUR APPROACH

In 2016, the Group adopted a corporate standard for comprehensive mine closure, that ensures legal compliance and the physical and chemical stability of the facilities as well as the management of environmental and social aspects not already covered by Chilean legislation.

### CONTEXT

Since 2012, Chilean law<sup>1</sup> has required mine operators to plan for the closure of their operations and to ensure the availability of the financial resources to do so. These plans must be updated every five years in order to reduce the risks and impact of the closure process on people and the environment. A closure plan may be permanent or temporary, and may apply to the complete operation or only to some of its facilities.

### OPERATING CONTEXT

All the Group's operations have closure plans approved by the National Geology and Mining Service (Sernageomin),<sup>2</sup> the government agency responsible for geological and mining issues.

### OUR CLOSURE PLANS

In 2016, Centinela updated its closure plan to combine the plans it has for its former Esperanza and El Tesoro operations before their integration. The plan outlines measures to ensure the physical and chemical stability of facilities remaining in the area of the mining operation, such as pits, waste dumps and tailings storage facilities, and the safe dismantling of the infrastructure. Approval of the updated plan by the authority is expected in the first quarter of 2017.

The closure of the Cerro Amarillo mine dump has continued its legal course. [+ see p. 69](#)

### MICHILLA

Michilla implemented a temporary

shutdown plan from January 2016 until its sale in November of the same year.<sup>3</sup>

### INTEGRATED MINE CLOSURE STANDARD

The Antofagasta Minerals mine closure standard sets guidelines for identifying key aspects of this stage of an operation and provides the tools for timely and effective planning, approval by the authority and the notification of the community. Among other things it includes risk evaluation, environmental and social impact assessment, and addresses financial and post-closure guarantees.

<sup>1</sup> Law 20,551, which regulates the closure of mining operations in Chile.

<sup>2</sup> National Geology and Mining Service – the state agency responsible for the country's geological and mining matters, including authorising mine closure plans.

<sup>3</sup> Michilla was sold to the Haldeman Mining Company (HMC).

## CERRO AMARILLO DUMP

Los Pelambres was commissioned in 1999 with the necessary permits granted by the Chilean environmental and technical agencies at that time. In 2004, authorisation was granted for the operation of Cerro Amarillo, a mining dump that contains the inert rock removed to gain access to the ore. The existence of these dumps is a common in mining communities worldwide and like all authorised mining dumps this one has an environmental closure plan approved by the relevant Chilean government agency.

According to the information at that time, the dump was located entirely within the perimeter of the Los Pelambres's property and within Chile's borders. A problem arose in 2012 after a joint boundary-marking programme by Chile and Argentina, which left part of the Cerro Amarillo dump on Glencore's property in Argentina.

### THE POSITION OF LOS PELAMBRES

Los Pelambres has always argued that the technically correct solution to the Cerro Amarillo situation is to carry out its closure plan, according international good practice in modern mining. This includes containment and control measures to avoid the risk of leakage over time. Once it was established that Cerro Amarillo straddles the border, Glencore's cooperation and the understanding of both countries is required in order to implement the full closure plan, which involves the transport of equipment and workers across the border. Thus far, Glencore has insisted on the total removal of the rocks, which would have a major impact on the environment.

Los Pelambres has complied with the permits that were granted at the time, but understands the need to find a solution to the problem, taking into account the various interests involved.

In April 2016, the company signed a Framework Agreement with the local authorities of the Argentinian Province of San Juan to facilitate the environmental isolation of the dump, currently located in Argentina. The aim was to ensure that Cerro Amarillo would not cause any environmental damage in the future. However, in October 2016, the authorities of the Province of San Juan terminated the agreement.

In January 2017, as agreed with the Province of San Juan, Los Pelambres completed the work of removing used tyres from the Cerro Amarillo dump. In total, more than 500 tyres were relocated to a storage facility on a company site in Chile. The operation was supervised at all times by personnel from the Argentinian and Chilean police forces, who created a temporary border crossing and ensured that the work was carried out in accordance with the laws of both countries.

As far as Los Pelambres is concerned, the main objective is to prevent potential environmental risk, by implementing the proper controls as set out in Cerro Amarillo's closure plan.





# ABOUT THIS REPORT

Welcome to our tenth annual Sustainability Report, which complements the Group's Annual Report. Here, we summarise our strategy, priorities and performance for the most material social, environmental, ethical and governance issues for our business and stakeholders.

This Report focuses on the topics of material interest to Antofagasta Minerals and its stakeholders in accordance with the Global Reporting Initiative (GRI) Guidelines, version G4, and its Mining and Metals Supplement.

The information presented here addresses the Group's management of sustainability issues during 2016, and includes data from previous years for context, together with the most important events up to April 30, 2017. This Report considers Los Pelambres, Centinela, Antucoya, Zaldívar and the Corporate Centre. This year Zaldívar, which has been operated by the Group since December 2015, is included following the Group's purchase of 50% of the company from Barrick Gold Corporation. Despite acquiring a 50% stake at Zaldívar, this Report considers the performance data in its totality, except for production, in order to give a complete overview of the Company. This Report does not include Michilla, which ceased operations in December 2015 and was subsequently sold in November 2016 to Haldeman Mining Company.

This Report has been verified by PricewaterhouseCoopers, who also verified its compliance with the principles of the International Council on Mining and Metals (ICMM). Information concerning CO<sub>2</sub> emissions was verified by SGS, an international company specialising in emissions testing.

The Report has been prepared by the Antofagasta Minerals Public Affairs Department in consultation with other key departments within the Group and is only available as a pdf file. The Public Affairs team was responsible for collecting and validating the information reported, as well as ensuring compliance with the GRI principles. This Report takes into account the advice of external experts for drafting and verification. This Report is a translation from the original Spanish version which is available on Antofagasta plc's website [www.antofagasta.co.uk](http://www.antofagasta.co.uk)

**THIS REPORT HAS BEEN PREPARED IN ACCORDANCE WITH  
THE GRI-G4 CORE REPORTING OPTION.**



# MATERIALITY ANALYSIS

Antofagasta Minerals conducted a formal process to determine the material issues for the development of this Sustainability Report.

Last year’s materiality matrix was updated to consider the following perspectives:

- 1. Internal view:** interviews with the Group’s senior management, and issues arising from the Business Strategy and Sustainability Policy.
- 2. External view:** topics of greatest relevance under General Rule 385 of the Chilean Corporate Governance regulations and DJSI-Chile, in addition to the main issues raised by the media on Antofagasta Minerals and the mining sector.

The identified issues were analysed by the Group and classified according to their “impact on the business” and “relevance to stakeholders”.

## MATERIAL ISSUES MATRIX – 2016

RELEVANCE FOR STAKEHOLDERS + -		<ul style="list-style-type: none"> <li>▶ Mining waste</li> <li>▶ Contribution to local economy and social development</li> <li>▶ Climate change</li> <li>▶ Energy</li> </ul>	<ul style="list-style-type: none"> <li>▶ Workplace safety and health</li> <li>▶ Water</li> <li>▶ Ethics and integrity</li> <li>▶ Labour relations</li> <li>▶ Environmental and social incidents/conflicts</li> <li>▶ Compliance</li> <li>▶ Business development</li> </ul>
		<ul style="list-style-type: none"> <li>▶ Air quality</li> <li>▶ Stakeholder engagement</li> <li>▶ Mine closure</li> <li>▶ Corporate governance</li> <li>▶ Contractor workers</li> <li>▶ Quality of employment</li> <li>▶ Biodiversity and heritage</li> <li>▶ Social impact</li> <li>▶ Human rights</li> </ul>	<ul style="list-style-type: none"> <li>▶ Risk management</li> <li>▶ Emergency preparedness</li> </ul>
	▶ Product life cycle	<ul style="list-style-type: none"> <li>▶ Attracting and retaining talent</li> <li>▶ Indigenous Peoples</li> </ul>	
	IMPACT ON THE BUSINESS - +		

# VERIFICATION REPORT



(A free translation from the original prepared in Spanish.)

## Independent Professionals Report

Santiago, May 9, 2017

Messrs. Shareholders and Directors  
Antofagasta Minerals S.A.

We have reviewed the 2016 Sustainability Report of Antofagasta Minerals S.A., for the year finalized on December 31, 2016. Antofagasta Minerals S.A. management is responsible for the 2016 Sustainability Report presentation in accordance with the "core" option of the sustainability reporting guidelines G4 of the Global Reporting Initiative. Our responsibility is to express a conclusion on the Sustainability Report based on our review.

Our review was conducted in accordance with attestation standards established by the Chilean Institute of Public Accountants A.G. Those standards require that we plan and perform the review to obtain limited assurance about whether any material modifications should be made to the Sustainability Report in order for it to be in accordance with the "core" option of the sustainability reporting guidelines G4 of the Global Reporting Initiative. A review is substantially less in scope than an examination, the objective of which is to obtain reasonable assurance about whether the Sustainability Report is in accordance with the "core" option of the sustainability reporting guidelines G4 of the Global Reporting Initiative, in all material respects, in order to express an opinion. Accordingly, we do not express such an opinion. We believe that our review provides a reasonable basis for our conclusion.

In addition, we performed the following procedures:

- work planning according to relevance and volume of the information presented in the 2016 Sustainability Report draft;
- understanding of the materiality process conducted by Antofagasta Minerals S.A., the material aspects identified, management approaches and selected indicators, in accordance with the "core" option under the GRI G4, including indicators of the GRI Mining and Metals Sector Supplement developed in conjunction with the International Council on Mining and Metals (ICMM);
- review of the compliance of the Sustainable Development Principles and Positions Statements of the ICMM;
- interviews with different executives responsible for the information in the 2016 Sustainability Report;
- verification, based on testing, that the data included in the 2016 Sustainability Report is consistent with the documentary evidence reviewed and/or comes from verifiable supporting information sources;
- verification that the greenhouse emissions inventory information has been verified by an independent third party;
- verification that the financial information included in the 2016 Sustainability Report is derived from accounting records or from audited financial statements as of December 31, 2016 by another firm of independent auditors.

The verified and the unverified indicators are detailed on pages 74 to 78 of the 2016 Sustainability Report.

Based on our review, we are not aware of any material modifications that should be made to the Sustainability Report of Antofagasta Minerals S.A. for the year ended December 31, 2016, in order for it be in accordance with the "core" option of the sustainability reporting guidelines G4 of the Global Reporting Initiative

Colin Becker

PricewaterhouseCoopers, Av. Andrés Bello 2711 – Pisos 2, 3, 4 y 5, Las Condes – Santiago, Chile  
RUT: 81.513.400-1 – Teléfono: (56) (2) 2940 0000 – [www.pwc.cl](http://www.pwc.cl)

# ICMM'S PRINCIPLES

## CONTENTS INDEX

ICMM PRINCIPLE	PAGE NUMBER
<b>1</b> Apply ethical business practices and sound systems of corporate governance and transparency to support sustainable development	14-21
<b>2</b> Integrate sustainable development in corporate strategy and decision-making processes	10, 12-15, 17, 22
<b>3</b> Respect human rights and the interests, cultures, customs and values of employees and communities affected by our activities	15, 19-21, 23, 30-35
<b>4</b> Implement effective risk-management strategies and systems based on sound science and which account for stakeholder perceptions of risks	18. Annual Report 2016 (pp. 23-27)
<b>5</b> Pursue continual improvement in health and safety performance with the ultimate goal of zero harm	23, 26-29
<b>6</b> Pursue continual improvement in environmental performance issues, such as water stewardship, energy use and climate change	22, 48-69
<b>7</b> Contribute to the conservation of biodiversity and integrated approaches to land-use planning	66, 67
<b>8</b> Facilitate and support the knowledge-base and systems for responsible design, use, re-use, recycling and disposal of products containing metals and minerals	Not applicable <sup>1</sup>
<b>9</b> Pursue continual improvement in social performance and contribute to the social, economic and institutional development of host countries and communities	23, 36-47
<b>10</b> Proactively engage key stakeholders on sustainable development challenges and opportunities in an open and transparent manner. Effectively report and independently verify progress and performance.	24, 25, 36-40

ICMM POSITION STATEMENT	PAGE NUMBER
Mining and Protected Areas	66, 67
Indigenous Peoples and Mining	21. Annual Report 2016 (p. 59)
Principles for Climate Change Policy Design	54-57
Mining Partnerships for Development	24, 25
Mercury Risk Management	Antofagasta Minerals does not use or produce mercury.
Transparency of Mineral Revenues	Not applicable <sup>2</sup>
Water Stewardship	51, 53
Tailings Governance	40

<sup>1</sup> Antofagasta produces raw materials.

<sup>2</sup> Antofagasta Minerals only has operations in Chile, a country which is not a member of the Extractive Industry Transparency Initiative (EITI).

# GRI-G4 CONTENTS INDEX

## CORE OPTION

GENERAL STANDARD DISCLOSURES	PAGE NUMBER	EXTERNAL VERIFICATION
<b>STRATEGY AND ANALYSIS</b>		
G4-1	2, 3	Verified, p. 73
G4-2	2, 3, 18, 22, 23, Annual Report 2016 Antofagasta plc (pp. 23-27)	Verified, p. 73
<b>ORGANISATIONAL PROFILE</b>		
G4-3	1	Verified, p. 73
G4-4	4, 5, Annual Report 2016 Antofagasta plc (pp. 2, 3)	Verified, p. 73
G4-5	Corporate office is located in Santiago, Chile	Verified, p. 73
G4-6	4, 5, 11, Annual Report 2016 Antofagasta plc (pp. 2, 3)	Verified, p. 73
G4-7	Antofagasta Minerals is a public listed company	Verified, p. 73
G4-8	8, Annual Report 2016 Antofagasta plc (pp. 14, 15).	Verified, p. 73
G4-9	4, 5, 8, 9, Annual Report 2016 Antofagasta plc (pp. 1, 2).	Verified, p. 73
G4-10	4, 5, 31, 33	Verified, p. 73
G4-11	33	Verified, p. 73
G4-12	8, 25, 34, 35, Annual Report 2016 Antofagasta plc (pp. 30, 31).	Verified, p. 73
G4-13	2, 5, 12	Verified, p. 73
G4-14	48-50	Verified, p. 73
G4-15	15	Verified, p. 73
G4-16	24, 25	Verified, p. 73
<b>MATERIAL ASPECTS AND BOUNDARIES</b>		
G4-17	Antofagasta plc's Annual Report 2016 covers the parent company of Antofagasta Minerals and Ferrocarriles de Antofagasta. The latter is not covered in this Sustainability Report.	Verified, p. 73
G4-18	72	Verified, p. 73
G4-19	72	Verified, p. 73
G4-20	79	Verified, p. 73
G4-21	79	Verified, p. 73
G4-22	28	Verified, p. 73
G4-23	This Report includes Zaldívar. The Report does not include information from Michilla which was sold in November 2016, having ceased operations in December 2015.	Verified, p. 73
<b>STAKEHOLDER ENGAGEMENT</b>		
G4-24	24, 25	Verified, p. 73
G4-25	24, 25. The Group has identified its main stakeholders as those who are part of its value chain, those who might be impacted by its operations and those who might impact its business.	Verified, p. 73
G4-26	24, 25	Verified, p. 73
G4-27	36, 37, 39-42, 46	Verified, p. 73

GENERAL STANDARD DISCLOSURES	PAGE NUMBER	EXTERNAL VERIFICATION
<b>REPORT PROFILE</b>		
G4-28	71	Verified, p. 73
G4-29	Antofagasta Minerals 2015 Sustainability Report (April 2016).	Verified, p. 73
G4-30	71	Verified, p. 73
G4-31	Back cover	Verified, p. 73
G4-32	71, 75-78	Verified, p. 73
G4-33	71, 73	Verified, p. 73
<b>GOVERNANCE</b>		
G4-34	14. Annual Report 2016 Antofagasta plc (pp. 71, 78, 92, 93)	Verified, p. 73
G4-35	14. Annual Report 2016 Antofagasta plc (p. 92)	Verified, p. 73
G4-36	14. Annual Report 2016 Antofagasta plc (pp. 92, 93)	Verified, p. 73
G4-37	24, 36-38. Annual Report 2016 Antofagasta plc (pp. 92, 93, 115, 116)	Verified, p. 73
G4-38	14. Annual Report 2016 Antofagasta plc (pp. 72, 73)	Verified, p. 73
G4-39	14. Annual Report 2016 Antofagasta plc (p. 72)	Verified, p. 73
G4-40	Annual Report 2016 Antofagasta plc (pp. 85- 87)	Verified, p. 73
G4-41	20. Annual Report 2016 Antofagasta plc (pp. 91, 118)	Verified, p. 73
G4-42	14. Annual Report 2016 Antofagasta plc (p. 71)	Verified, p. 73
G4-43	Annual Report 2016 Antofagasta plc (pp. 78, 79)	Verified, p. 73
G4-44	Annual Report 2016 Antofagasta plc (pp. 82, 83)	Verified, p. 73
G4-45	14, 18. Annual Report 2016 Antofagasta plc (pp. 92, 93)	Verified, p. 73
G4-46	18. Annual Report 2016 Antofagasta plc (pp. 92, 93)	Verified, p. 73
G4-48	Annual Report 2016 Antofagasta plc (p. 92)	Verified, p. 73
G4-51	Annual Report 2016 Antofagasta plc (pp. 96-99)	Verified, p. 73
G4-52	Annual Report 2016 Antofagasta plc (pp. 96-99)	Verified, p. 73
<b>ETHICS AND INTEGRITY</b>		
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G4-57	20, 21	Verified, p. 73
G4-58	20, 21	Verified, p. 73

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<b>ETHICS AND INTEGRITY</b>		
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G4-SO4	21	Verified, p. 73
G4-SO6	25	Verified, p. 73
<b>COMPLIANCE</b>		
DMA	19	Verified, p. 73
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DMA	18	Verified, p. 73
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G4-HR9	21. Annual Report 2016 Antofagasta plc (p. 59)	Verified, p. 73
<b>INDIGENOUS PEOPLES</b>		
DMA	21	Verified, p. 73
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<b>CLIMATE CHANGE</b>		
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G4-SO11	37, 39, 41, 42	Verified, p. 73
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## MATERIAL ISSUES AND BOUNDARIES WITHIN AND BEYOND THE ORGANISATION

DIMENSION	MATERIAL ISSUE	ASPECT BOUNDARY: WHERE DOES THE IMPACT OCCUR?					
		WITHIN THE GROUP					OUTSIDE THE GROUP
		Group	Los Pelambres	Centinela	Antucoya	Zaldívar	
Strategy, Governance and Ethics	Ethics and integrity	x	x	x	x	x	x (contractors)
	Compliance	x	x	x	x	x	x (contractors)
	Risk management	x	x	x	x	x	x (contractors)
	Business development	x	x	x	x	x	
	Corporate governance	x					
	Human rights	x	x	x	x	x	x (contractors)
	Indigenous peoples	x	x	x	x	x	
Environment	Water		x	x	x	x	
	Mining waste		x	x	x	x	
	Climate change	x	x	x	x	x	
	Energy	x	x	x	x	x	
	Air quality		x	x	x	x	
	Mine closure	x	x	x	x	x	
	Biodiversity and cultural heritage	x	x	x	x	x	
Community	Socio-environmental incidents or conflicts	x	x	x	x	x	
	Contribution to local economy and social development		x	x	x	x	
	Stakeholder engagement	x	x	x	x	x	
	Social impact		x	x	x	x	x (contractors)
	Emergency preparedness		x	x	x	x	
Workers and contractors	Safety and health	x	x	x	x	x	x (contractors)
	Labour relations	x	x	x	x	x	x (contractors)
	Job quality	x	x	x	x	x	
	Talent attraction and retention	x	x	x	x	x	
	Contractors	x	x	x	x	x	x (contractors)





ANTOFAGASTA  
MINERALS

## SUSTAINABILITY REPORT 2016

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### **Management**

Public Affairs Division, Antofagasta Minerals

### **Contents**

Kodama & Mex

### **Design and production**

Loreto Cammas Diseño

May, 2017

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## ANTOFAGASTA MINERALS

Apoquindo 4001 - 18th floor  
Santiago, Chile  
Tel: (56-2) 2798 7000

[www.aminerals.cl](http://www.aminerals.cl)



This Report complements Antofagasta plc's Annual Report and Financial Statements 2016, available at [www.antofagasta.co.uk](http://www.antofagasta.co.uk)

### CONTACT

For more comments or questions about this Report please contact [inforeporte@aminerals.cl](mailto:inforeporte@aminerals.cl)