

# 2021 Climate Change Report

Producing Copper Responsibly and Sustainably





## 2021 Climate Change Report

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Climate Change Committee

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## Message from the Chief Executive Officer

The urgency of the threat posed by global warming was recently underscored by the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). Emphasising the unprecedented scale of the changes taking place in the climate system, it warned of the extent of the reductions in greenhouse gas emissions that will be required to limit global warming to the target of 1.5°C and avert the most devastating effects of climate change.

As a copper producer, Antofagasta has a twofold contribution to make to addressing this challenge. As well as decarbonising our operations - as we are in the process of doing under our Climate Change Strategy - we can also be part of the solution by responsibly and sustainably supplying an input that is critical for the low-carbon technologies - from electromobility to the generation of renewable energy - that will, in turn, be key for reducing global emissions.

Climate change has long been a key consideration in our risk management and operating decisions and we have now gone on to deploy a broad-ranging Climate Change Strategy. Emissions reduction is, of course, central to it but it also focuses on adaptation and seeks to increase the resilience of our operations and the surrounding environment to changes such as declining rainfall and the resulting drought conditions.

Following the Strategy's approval by the Board of Directors in late 2020, we established a special Climate Change Committee and, through a transversal, collaborative and inter-disciplinary process, have made important progress on the different actions envisaged under the Strategy's five pillars: development of climate resilience, emissions reduction, efficient management of strategic resources, management of the environment and biodiversity, and the integration of stakeholders.

We have also set ourselves new and more ambitious climate-related targets. As well as carbon neutrality by 2050 - in line with Chile's national commitment - they include the intermediate target of a 30% reduction in emissions by 2025, compared to 2020. This is supported by the gradual switch of our operations to electricity generated exclusively from renewable sources, which we will complete in 2022.

Water scarcity is also a key concern in the areas where we operate and we are adjusting our sources of supply accordingly. Provided environmental permitting advances as scheduled, we expect that, by 2025, raw or desalinated seawater and reused or recycled water will account for 90% of our consumption. As well as ensuring supply security for our operations, this will help nearby communities by freeing continental water for human and agricultural consumption.

Looking ahead, we are implementing an important Electromobility Plan, focusing on the mine haulage trucks that are our main source of diesel-generated emissions. Our ultimate aim is to eliminate diesel entirely from our operations, replacing it with cleaner fuels such as hydrogen.

In 2019, we committed to implementing the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) and have recently published our 2021 TCFD Progress Report. The TCFD framework has proved extremely useful in helping us integrate climate change considerations into our core operating and financial planning cycles.

Our Climate Change Strategy has short, medium and long-term measures defined for each of its pillars. However, it is also a dynamic strategy that we will be adapting in line with changing climate scenarios, regulation and scientific and technological advances, always with the aim of boosting the company's resilience and competitiveness. This is, we believe, the way to fulfil our purpose of developing mining for a better future.

**Iván Arriagada**  
Chief Executive Officer

# Position Statement on Climate Change

At Antofagasta plc, we recognise that climate change is one of the greatest challenges facing society and our company today. It will not only affect our company, but also society as a whole. Copper, a key metal in low-carbon technologies, is helping to build a better future.

In line with this, we recognise:

- ▶ Our role and responsibility in contributing actions to address climate change; consequently, we are working to put climate change at the centre of our business and strengthen the climate resilience of both our operations and the environments and communities in our areas of influence;
- ▶ The need to support the goals of the Paris Agreement of reducing GHG emissions in the next decades and reach carbon neutrality by 2050;
- ▶ The urgency of reducing emissions, promoting climate resilience throughout our value chain and supporting multi-sector collaboration to accelerate the development and use of low-emission technologies as part of the necessary action for the transition to carbon-neutral mining;
- ▶ The importance of protecting the environment and biodiversity as key for enhancing the role of nature-based solutions in mitigating climate change and adapting to it.

In addition, as part of the International Council on Mining and Metals (ICMM), we adhere to its principles and the new Position Statement on Climate Change issued in October 2021.

Our Climate Change Strategy, therefore, seeks to:

**Strengthen the Group's capacity to mitigate and adapt to climate change, enabling it to take early action to manage the resulting risks and opportunities in such a way as to mitigate the effects of climate change and have the capacity to adapt to new scenarios.**

The five pillars that underpin the climate action envisaged in our Strategy serve as the framework of our roadmap for “developing climate change resilience, reducing GHG emissions, managing strategic resources, managing the environment and biodiversity, and integrating stakeholders”.

## Milestones

In 2018, we set ourselves the target of reducing our direct (Scope 1) and indirect (Scope 2) greenhouse gas emissions by 300,000 tonnes by 2022. As of end-2020, we had more than met this target, achieving a reduction of over 580,000 tonnes compared to the 2017 baseline.

In 2020, we progressed in our transition to the use of electricity from renewable sources. In July, Zaldívar became our first site to operate exclusively with renewable energy and, by 2022, all our electricity consumption will be renewably generated.

In May 2021, we announced two new emissions targets. In the short term, we aim to reduce our Scope 1 and 2 emissions by 30% by 2025 compared to 2020, equivalent to a reduction of 730,000 tonnes of CO<sub>2</sub>e. In line with Chile's national commitment, we are committed to achieving carbon neutrality by 2050, or sooner if technology permits.

## Key initiatives

Under our Electromobility Plan, we are partnering with the Hydra consortium, an initiative that is exploring the use of hydrogen in mine haulage trucks. The aim of this and other projects is to create the conditions for the use of hydrogen in mining and to understand its real potential as a replacement for diesel.

To address water scarcity, we are working to increase the use of seawater in copper production. Today, this accounts for 43% of our water consumption but, as from 2025, providing the required permitting is in place, seawater and reused or recycled water will supply 90% of our consumption.

We have adopted the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) as a means of strengthening our climate resilience, adapting to the current impacts of climate change whilst also mitigating emerging climate risks and taking advantage of the opportunities to decarbonise our business. The TCFD recommendations serve as an appropriate framework for sharing our efforts to combat climate change with our stakeholders and for managing its impacts.

### Scope 1 emissions

2020 Total

1,144,258 t CO<sub>2</sub>e

### Scope 2 emissions

2020 Total

1,290,748 t CO<sub>2</sub>e

### Scopes 1 and 2 target 30% reduction

by 2025 compared to 2020

**Carbon neutrality**  
by 2050 or sooner if  
technology permits

### Scope 3

In 2022, bring forward  
emissions inventory and  
establish commitments

# Chile and Climate Change

The scientific evidence on the impacts of climate change is conclusive. In its latest report, “Climate Change 2021: The Physical Science Basis”, the Intergovernmental Panel on Climate Change (IPCC) found that:

- ▶ It is unequivocal that human influence has warmed the atmosphere, ocean and land.
- ▶ Human-induced climate change is already affecting many weather and climate extremes in every region across the globe.
- ▶ Global warming of 1.5°C and 2°C will be exceeded during the 21st century unless deep reductions in carbon dioxide (CO<sub>2</sub>) and other greenhouse gas emissions occur in the coming decades.

According to its Fourth National Communication to the UN Framework Convention on Climate Change (UNFCCC), submitted in May 2021, Chile accounts for just 0.24% of global greenhouse gas (GHG) emissions. It reported 112,313 ktCO<sub>2</sub>e<sup>1</sup> of emissions in 2018, a 128% increase on 1990 (albeit only 2% in 2016-18).

Under Article 4, N° 8 of the UNFCCC (1992), Chile is considered highly vulnerable to climate change since it has low-lying coastal areas, arid and semi-arid areas, forested areas and areas liable to forest decay, areas prone to natural disasters, areas liable to drought and desertification, areas of high urban atmospheric pollution and areas with fragile ecosystems.



Given Chile's geography and the resulting different climate zones, ranging from the Atacama Desert in the north through the Mediterranean climate of much of central Chile to the colder, wetter south, the impacts of climate change will vary depending on the particular part of the country. However, they can be summarised as:

- ▶ **Higher temperatures.** Studies suggest that climate change will mean higher minimum and maximum temperatures throughout the country and across all seasons. This would be accompanied by more frequent and longer heatwaves.
- ▶ **Lower average annual rainfall.** Rainfall would continue to decrease significantly in most of the country, with more frequent and longer droughts such as that already seen in the Coquimbo Region of northern-central Chile where our Los Pelambres operation is located.

- ▶ **Extreme events.** Within a context of lower rainfall, there will be a greater likelihood of short intense storms that can cause flooding and landslides. This would be a risk particularly in northern Chile where our Antucoya, Centinela and Zaldívar operations are located as well as in the Coquimbo Region.
- ▶ **Sea swells and tidal surges.** In recent years and, particularly in 2021, events of this type have become far more common, disrupting port activities.

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<sup>1</sup> Thousand tonnes of carbon dioxide equivalent.



## International and national climate policies

After the Kyoto Protocol, the Paris Agreement, adopted by the 21st Conference of the Parties (COP) in December 2015, is currently the legally binding international instrument for limiting global GHG emissions. Chile ratified the Agreement in 2017. Its key objective is to strengthen global response to the threat of climate change and it proposes to limit the increase in the global temperature by the end of the century to less than 2°C, compared to pre-industrial levels, and to heighten efforts to keep the increase to less than 1.5°C.

Chile presented its first Nationally Determined Contribution (NDC) to the UNFCCC in 2015. Under the Paris Agreement, countries were asked to present new or updated NDCs in 2020, with which Chile has complied. It has committed to an emissions budget of no more than 1,100,000 ktCO<sub>2</sub>e in 2020-2030, peaking in 2025 and dropping to 95,000 ktCO<sub>2</sub>e in 2030.

In June 2019, the government announced a national commitment to carbon neutrality by 2050. A proposed Framework Climate Change Law, presented to Congress by the government in January 2020, would give legal force to this target and strengthen the institutional framework for the implementation of mitigation and adaptation measures. In line with one of the bill's provisions, the government has drawn up a Long-Term Climate Strategy. Covering the period to 2050, it establishes a national carbon budget through to 2030 and 2050 as well as sector-specific budgets, with adaptation targets for compliance within ten years.

Supporting these targets, a new Energy Efficiency Law came into force in February 2021. Under it, the Energy Ministry in Chile must draw up a National Energy Efficiency Plan, covering matters that include industrial and residential energy use, transport, building standards and the labelling of electric appliances.

Under the Law, the Plan must aim to reduce the country's energy intensity by 10% by 2030. The Law's associated regulation requires large industrial energy users (annual consumption of over 50 teracalories) to reduce their average energy intensity by at least 4% over a five-year period. Pending the issue of the corresponding decree, this would apply to all our four mining operations.

# Our Business at a Glance

Antofagasta plc is a Chile-based copper mining group. We are listed on the London Stock Exchange and are a constituent of the FTSE 100 index. We participate in sustainability indexes such as the DJSI, FTSE4Good and Stoxx Global ESG Leaders.

Mining is our core business, representing over 97% of our revenue and EBITDA. We operate four copper mines in Chile, two of which produce significant volumes of molybdenum and gold as by-products. We also have a portfolio of growth opportunities located mainly in Chile. In addition to mining, our Transport division provides rail and road cargo services in the Antofagasta Region, predominantly to mining customers, which include some of our own operations.

Our mining assets are divided into the North Operations unit, comprising Antucoya, Centinela and Zaldívar in the Antofagasta Region, and Los Pelambres in the Coquimbo Region.

## 2020 performance

### Copper production

733,900 tonnes

### Revenue

\$5,129m

### EBITDA

\$2,739m

## Antucoya

70% owned

Produces copper cathodes

## Centinela

70% owned

Produces copper cathodes and copper concentrates containing gold and silver and a separate molybdenum concentrate

## Zaldívar

50% owned

Produces copper cathodes

## Los Pelambres

60% owned

Produces copper concentrates containing gold and silver and a separate molybdenum concentrate

## Transport

100% owned

700 km rail network

### Antofagasta Region



Centinela Port

### Coquimbo Region



Punta Chungo Port



Santiago

► For more information, see our [Annual Report, pages 6-7](#).

# Our Climate Change Strategy

As a Group, we recognise climate change as one of the greatest challenges facing the world today and acknowledge our role and responsibility to be part of the solution. As a copper producer, we supply an input that is critical for low-carbon technologies and, at the same time, are working to decarbonise our operations, putting climate change at the heart of how we manage our business.

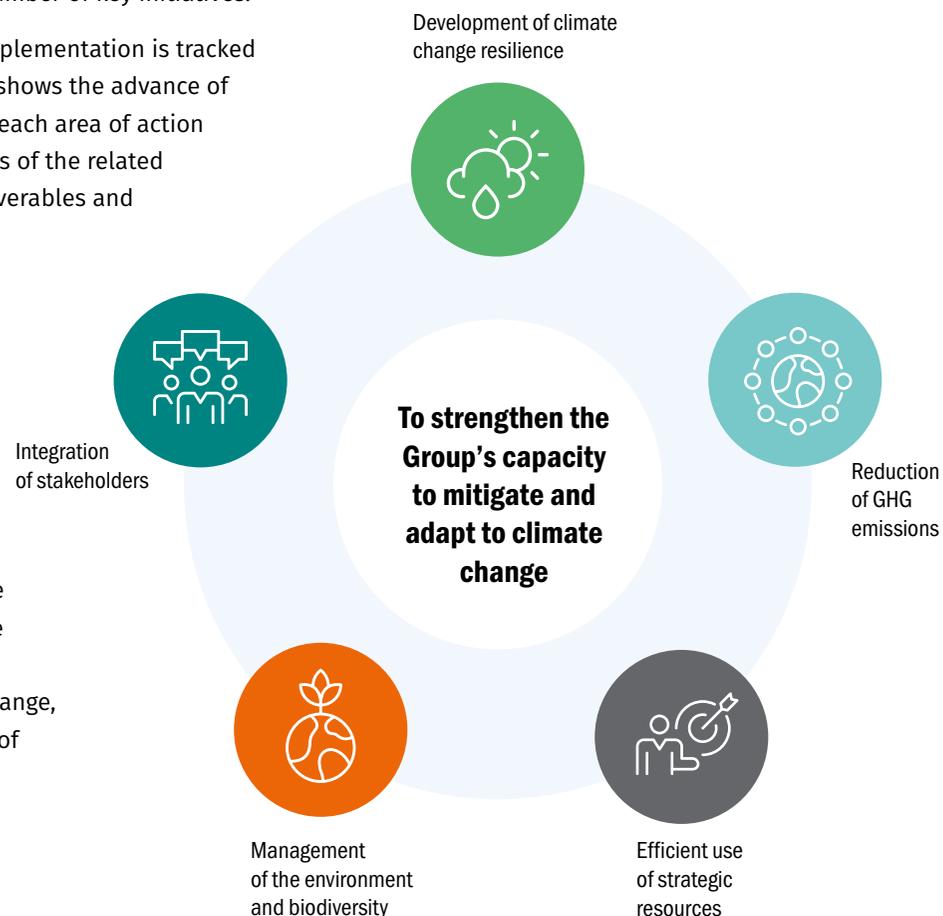
Our Climate Change Strategy, which was approved by the Group's Board of Directors in November 2020, integrates the instruments for managing climate change that we already had in place, thereby strengthening the Group's mitigation and adaptation response. It is designed to facilitate early management of risks and opportunities, mitigating climate change's effects and enabling us to adapt to changing scenarios. Under the Strategy, we have been able to design and implement different initiatives that will allow us to be prepared for the transition to GHG emissions net zero mining.

The Strategy has five pillars: development of resilience to climate change, reduction of greenhouse gas emissions, efficient use of strategic resources, management of the environment and biodiversity, and integration of stakeholders. For each pillar, different areas of action have been identified, accompanied by a plan of short, medium and long-term initiatives.

Different areas of our operations are involved in the Strategy's implementation. Through collaborative work, innovation and capacity building, we are moving towards embedding awareness of climate change more deeply into our decision-making processes and accelerating progress on a number of key initiatives.

Progress on the Strategy's implementation is tracked through a dashboard, which shows the advance of each pillar in general and of each area of action in particular as well as details of the related initiatives, including the deliverables and persons responsible.

To complement and support the Climate Change Strategy, we are currently drawing up an Energy Policy (in line with the requirements of Chile's new Energy Efficiency Law), a Water Policy and an updated Biodiversity Standard. We are also seeking to set ever more specific targets for different aspects related to climate change, such as efficiency in the use of resources.





## Implementation process

Once the Board had approved the Climate Change Strategy, we established a Climate Change Committee, which began work in January 2021 ([page 13](#)). Led by the Environmental team - which had also led the drafting of the Strategy - it includes representatives of all the other related corporate areas as well as the operations.

One of the Climate Change Committee's objectives is to maximise engagement across the different areas and levels of the organisation. This is reflected in an experience of horizontal collaboration that has been both dynamic and enriching.

# Governance

The Company's Board of Directors has ultimate responsibility for the Group's climate-related objectives and strategy. It has recognised climate change as one of the principal risks facing the Group and has approved the associated risk appetite statement.

In its oversight of these issues, the Board is assisted by several Committees:

- ▶ The **Sustainability and Stakeholder Management Committee** is responsible for reviewing and monitoring the Group's strategy, policies and performance on key sustainability issues, including climate change as well as other environmental, health and safety, human rights, communities and stakeholder issues.
- ▶ The **Audit and Risk Committee** supports the Board in monitoring and reviewing the Group's risk management system and internal control system on an ongoing basis, including emerging and principal risks in relation to climate change, and reports any significant matters to the Board at least three times a year.
- ▶ The **Remuneration and Talent Management Committee** assists the Board by, among other activities, ensuring that the Group's remuneration arrangements are conducive to effective implementation of its strategy, including its Climate Change Strategy. In this role, it reviews the short and long-term incentive scorecards of the Group's two employee bonus plans in which, over recent years, KPIs related to climate change have been given greater weight ([page 58](#)).

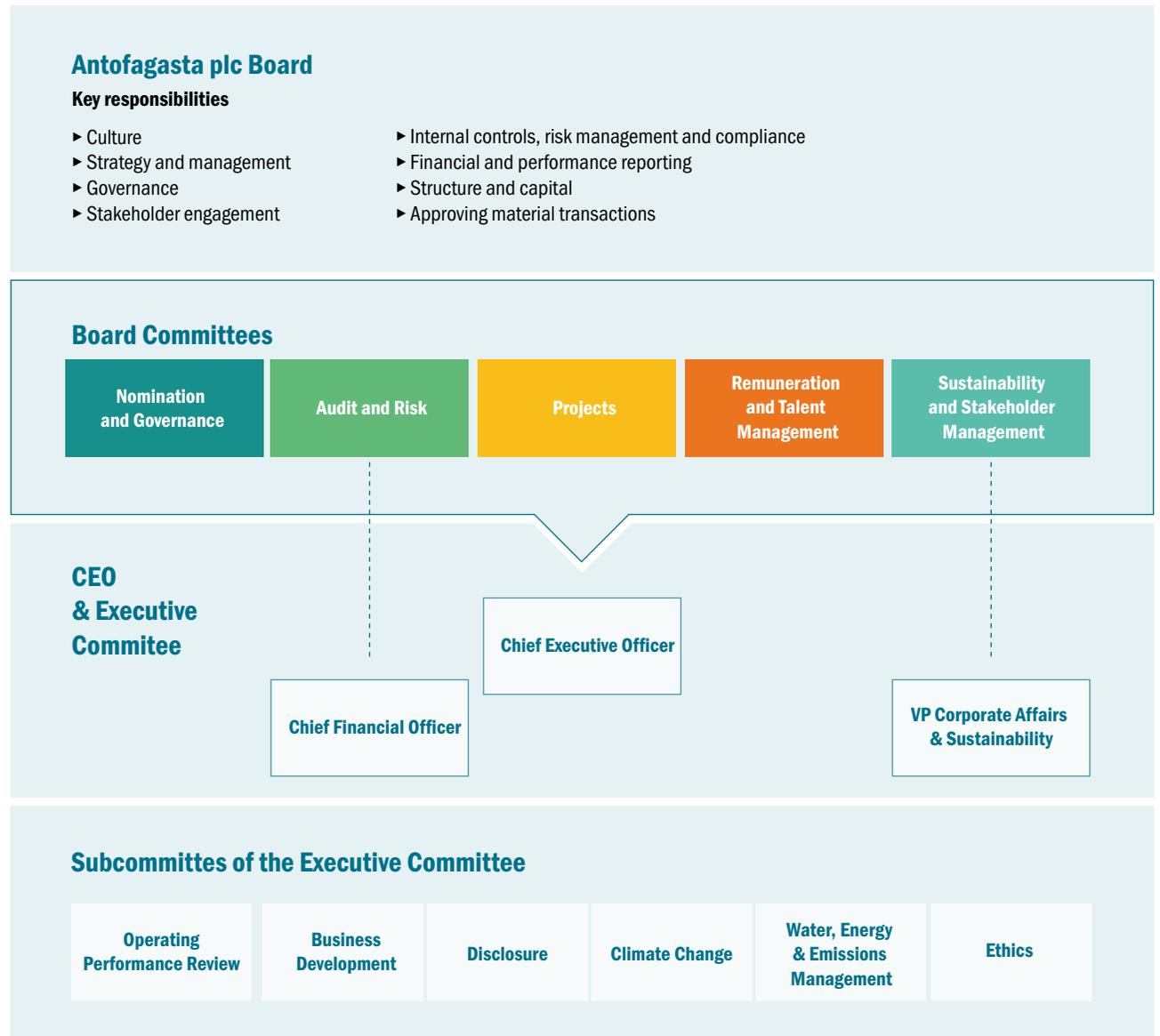


Climate-related responsibilities have been assigned to specific management-level positions. The CEO is responsible for approving targets and monitoring the status of emissions-reduction initiatives. The Vice President of Corporate Affairs and Sustainability, the Chief Financial Officer (CFO) and the Vice President of Strategy and Innovation are responsible for proposing targets and reporting on adaptation and mitigation issues. The CFO and the Vice President of Corporate Affairs and Sustainability work closely with the Audit and Risk Committee and the Sustainability and Stakeholder Management Committee, respectively.

In implementing the Group's strategy, the CEO is assisted by an Executive Committee to which environmental matters, including climate change, are reported monthly. The Executive Committee, in turn, has a number of subcommittees. They include the Climate Change Committee, created in January 2021, to monitor development and implementation of the Climate Change Strategy.

Led by the Environmental team, it is a multidisciplinary committee that brings together representatives of the relevant corporate areas and our different operations. Meetings are held fortnightly to discuss advances in the Group's strategy and also serves as a forum where specialists are invited to present on topics of interest.

### ► Group Climate Governance Model

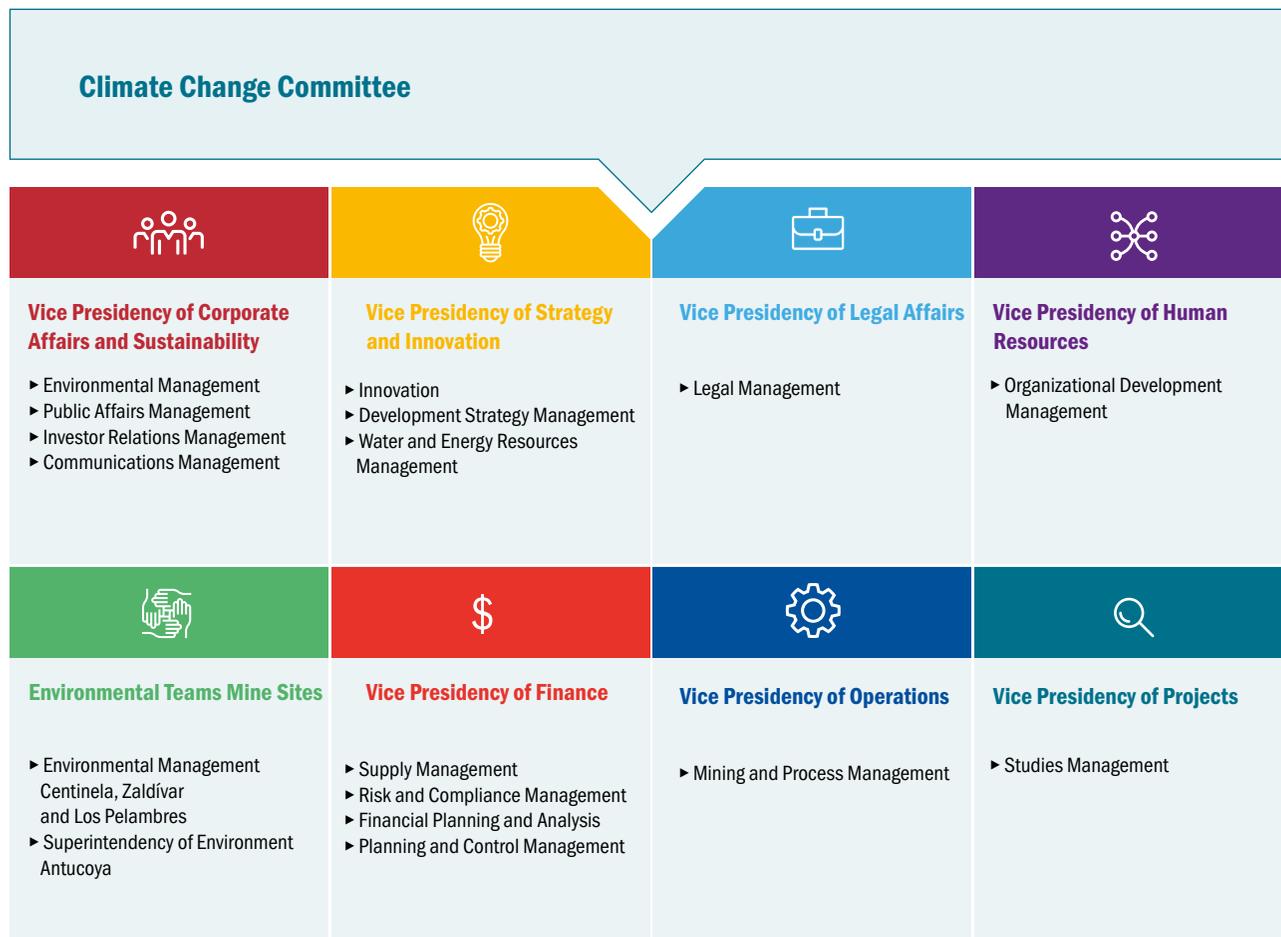


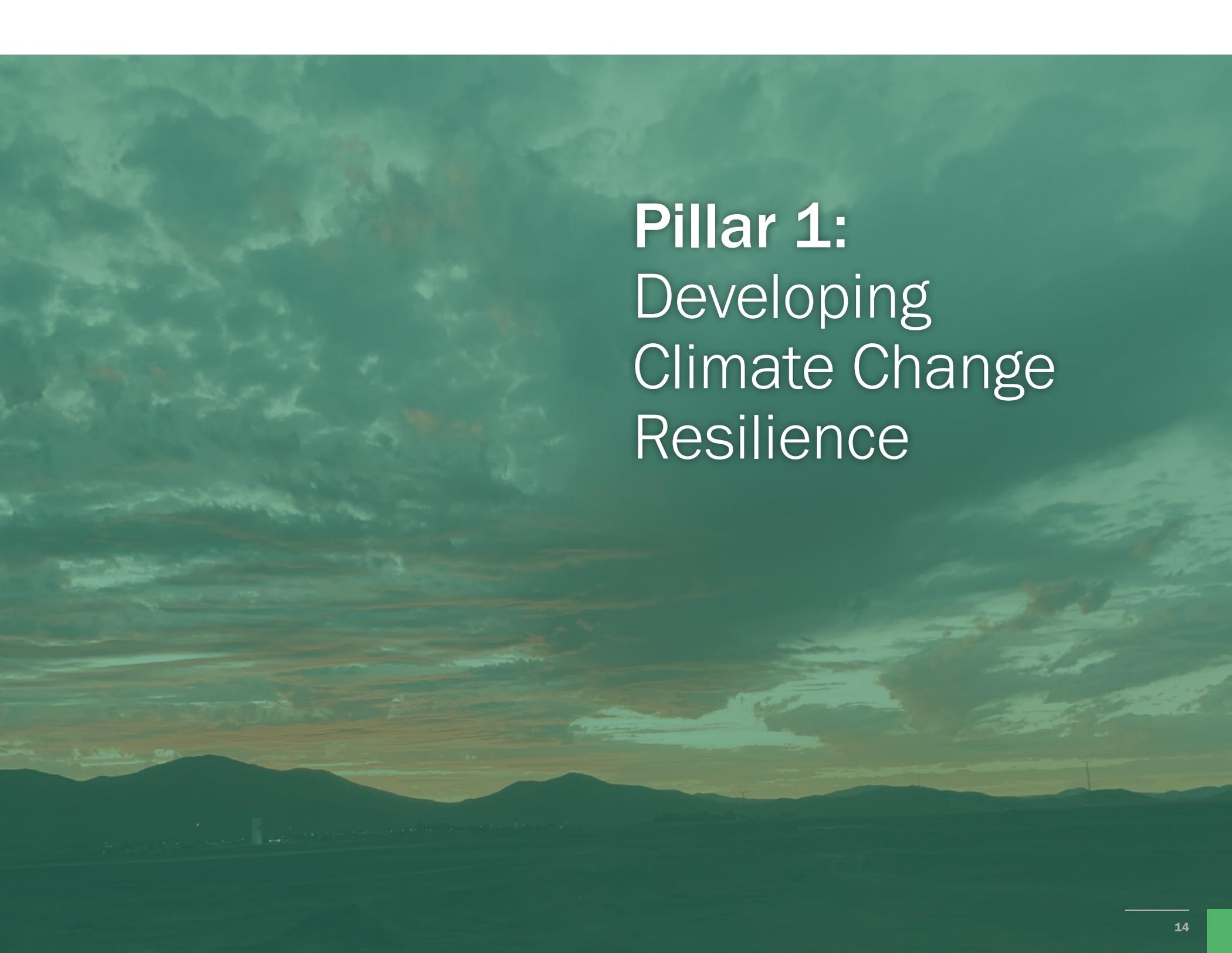
## Functions of the Climate Change Committee

The Climate Change Committee is responsible for supporting line management on the implementation, monitoring and continuous improvement of the Group's Climate Change Strategy, ensuring the proper prioritisation of its pillars, areas of action, activities and tasks and for maintaining a balance of progress as regards mitigation and adaptation. The Committee is led and coordinated by the Environment team and comprises members of the different areas of the organisation, whose main responsibilities include:

1. Promote awareness and understanding of the Climate Change Strategy in the organisation's different areas and departments;
2. Work on the implementation, monitoring and continuous improvement of those activities that are the specific responsibility of the respective member;
3. Complement from an integral and multidisciplinary standpoint those activities and tasks that are the responsibility of other members of the committee;
4. Identify proactively risks and opportunities related to climate change in the member's field of work;
5. Contribute to the design of agendas, development of topics, possible talks and the invitation of guests to the Committee's fortnightly meetings as well as possible extraordinary activities;
6. Attend all Committee meetings (and, in the case of absence, send a replacement) and regularly report the progress, gaps and challenges in the member's respective area of responsibility.

### ► Structure of the Climate Change Committee





# **Pillar 1:** Developing Climate Change Resilience



## OBJECTIVE

To advance measures to identify, analyse and manage the risks and opportunities associated with different climate change scenarios, thereby enhancing the Group's resilience and competitiveness in the face of an uncertain future.

Strengthening climate resilience through decarbonisation, mitigation and adaptation is a core element of our business strategy. Climate resilience is essential for us to be able to fulfil our commitment to develop mining for a better future. Today, we are already experiencing the impacts of climate change and are implementing action plans to develop our understanding of climate impact and adapt critical infrastructure. We are also progressing our mitigation strategy ([page 32](#)) to minimise the potential impact from climate-related changes and bolster our resilience.

Our climate resilience strategy covers three key areas:

- ▶ **Climate scenario modelling.** Study and update climate models and/or projections for different trajectories of CO<sub>2</sub> emissions and temperature scenarios, generating relevant information for the evaluation of risks, opportunities and reportability under national and international standards.
- ▶ **Adaptation of critical infrastructure and processes.** Design, implement and update adaptation plans for infrastructure and critical processes based on physical, acute and chronic risks, detected through the modelling of climate scenarios and/or projections.
- ▶ **Collaboration in the detection of adaptation opportunities.** Generate collaborative and participatory processes with employees, communities and other stakeholders such as contractors, suppliers and local government actors, to identify adaptation opportunities and assess the anticipated impacts of climate change and transition plans.





In 2019, we committed to implement, and disclose against, the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD). Since then, we have made significant advances against the TCFD recommendations, which are disclosed in our 2020 Annual Report and our 2021 TCFD Progress Report. However, the greatest gain to our business is how the TCFD framework has helped us integrate climate change considerations into our core operating and financial planning cycles, which govern the way we manage our business. The analysis we have undertaken helps to demonstrate the resilience of our strategy and portfolio of assets to the potential impacts identified through climate scenario analysis. We are strengthening our climate resilience by ensuring appropriate systems and processes are in place. For example:

- ▶ Updated governance of climate-related issues, and our ability to take advantage of mitigation efforts, through the establishment of two new Committees.
- ▶ Climate change risks are managed as part of our Integrated Risk Management System, with risk appetite and impact defined in relation to other business risks.
- ▶ Building on our climate scenario analysis, we have developed a model that permits the assessment of climate risks and opportunities across future climate scenarios on an ongoing basis.
- ▶ We have built on existing carbon management programmes, to integrate and embed climate risk analysis into forward-looking strategic and financial planning. Selected climate-related impact on cash flows is now fully integrated into our financial planning process.
- ▶ We are in the process of finalising a Long-Term Energy and Carbon Reduction Plan and have introduced an internal carbon price to incentivise the allocation of capital to projects, which will decarbonise our operations ([page 40](#)).
- ▶ We have incorporated various adaptation measures to build resilience to possible future climate change anomalies:
  - Desalination plant at Los Pelambres.
  - Installation of our wave measurement system ([page 17](#)).
  - Increasing storage capacity of our onsite acid and diesel tanks to provide greater operational continuity.

# Adaptation

Climate scenario analysis has challenged business-as-usual thinking when assessing future risks and opportunities. Understanding our exposure and vulnerability to potential changes in the climate is the first step in identifying appropriate control measures. Our long-term vision is to minimise our emissions, enhance water security and have resilient operations that can withstand the effects of climate change and create value over the long term. In recent years we have adopted several adaptation measures such as strict water management controls to build resilience to water shortages, and expanding on-site storage capacity of supplies to mitigate disruption from port closures or interruptions in our supply chains.



## Adapting to Changing Sea Conditions

Our operations in northern Chile rely largely on two ports: Mejillones, through which we import diesel and sulphuric acid and export our finished cathodes, and Centinela Port, from which the Centinela mine ships the copper concentrate it transports down to the coast by pipeline.

In recent years, we have experienced higher and stronger tidal waves that have made the operating conditions of the ports more difficult and led to more frequent stoppages of port activities. In one case in early 2021, Mejillones was closed for almost 30 consecutive days as a result of wave conditions.

As well as our mining operations, this also affects our freight transport operation, the Ferrocarril de Antofagasta a Bolivia (FCAB). We estimate that, a significant portion of FCAB's transport interruptions related to climate change can be attributed to port closures.

To build resilience to these events and safeguard operational continuity, we are taking a number of measures. We have implemented a project to increase the capacity of our onsite acid and diesel tanks to provide greater operational continuity. In the case of copper concentrate, Centinela is evaluating different options such as road

transportation of concentrate and securing capacity at alternative ports if climate conditions make it necessary.

Los Pelambres, located further south, has also been affected by similar climate conditions at its port in Los Vilos, albeit to a lesser extent. Here, we have managed the impact by synchronising concentrate-loading operations with the expected windows of appropriate wave conditions. The installation of our own wave measurement system, rather than relying on that of a larger nearby bay, has played a key role in enabling us to predict upcoming operating conditions at the port. This system, combined with optimising our maintenance practices, makes efficient use of the available transport windows.

# Risk identification

## Risk management

Climate change risks and associated controls are managed as part of our Integrated Risk Management System, with risk appetite and impact defined in relation to other business risks. Climate Change is one of our 18 Principal Risks and is analysed using our risk management methodology, which we apply consistently across all our operations, projects and activities. We continually measure, monitor and report our risks, with our risk assessment, which scores the estimated level of impact and probability, and risk appetite is reviewed annually. As of 2021, our risk appetite for climate change is medium (acceptable exposure to future uncertainties that the organisation is willing to assume to achieve its objectives).

Our aim is to identify and prioritise key risks to the business in terms of financial impact. Given the effect that climate change is already having globally, we recognised that it was vital to integrate climate-related risks into our existing risk management and planning processes. We have analysed these risks considering the level of impact and probability, as well as assessing the impact against three views: 1) with no mitigation or adaptation, 2) with controls already in place, and 3) with future plans and actions. We held multidisciplinary workshops across our business to identify top climate-related risks to each operation and the business.

These risks were assessed using an ISO 31.000 and best practice methodology (Bow Tie which considers cause, consequence and controls) and evaluated the financial impact under the three views listed above. Risk owners were identified for each risk to ensure accountability for the monitoring and management of the risk, controls and action plans. The outcomes of this assessment have propelled us to continue to update and implement measures in our Energy Strategy and Electromobility Plan as well as to invest in adaptation infrastructure to minimise the potential impacts of climate events.

In assessing climate-related risks, we follow the TCFD risk typology, broadly dividing risks into two categories: risks related to the impact of the transition to a low-carbon economy, and risks related to the physical impacts of climate change.

## Transition

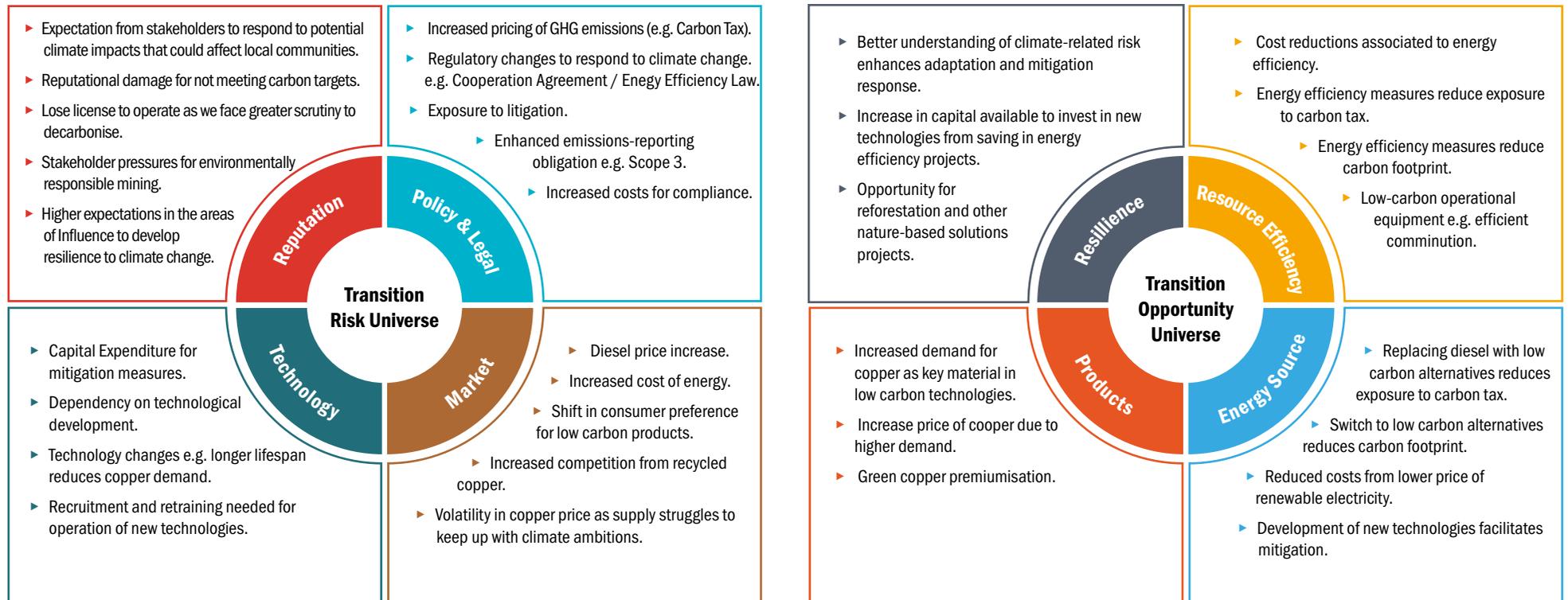
In an aggressive mitigation scenario, policy, technology and market changes will be required to decarbonise society. Higher climate ambitions on the part of the Chilean government may result in increased cost of compliance and operation due to policies such as the revision to carbon taxes, the Energy Efficiency Law and sector-specific carbon budgets. Our ambition to decarbonise will increase costs for R&D and low-carbon technology, but will reduce our exposure to transition risks. Furthermore, we expect to see a global increase in demand for copper as a critical mineral in low-carbon technologies.

## Physical

In a high-warming scenario, gradual changes in weather as well as the increased severity and frequency of climate hazards will impact our operations. Extreme temperatures place stress on employees exposed to these conditions as well as on equipment and infrastructure. Droughts and continued arid conditions mean sites reliant on continental water will face operation constraints as water is critical input. Intense rainfall events and extreme wave storms may damage assets, cause disruptions and suspend operations. These extreme changes in weather may imply an increased need to support local communities.

## Transition risks and opportunities

An extensive risk and opportunity identification and assessment process was undertaken based on a review of sector peers, mining sector research, Chilean government climate policy, international standards and climate scenario pathways. The most material risks were prioritised for further analysis and understanding.

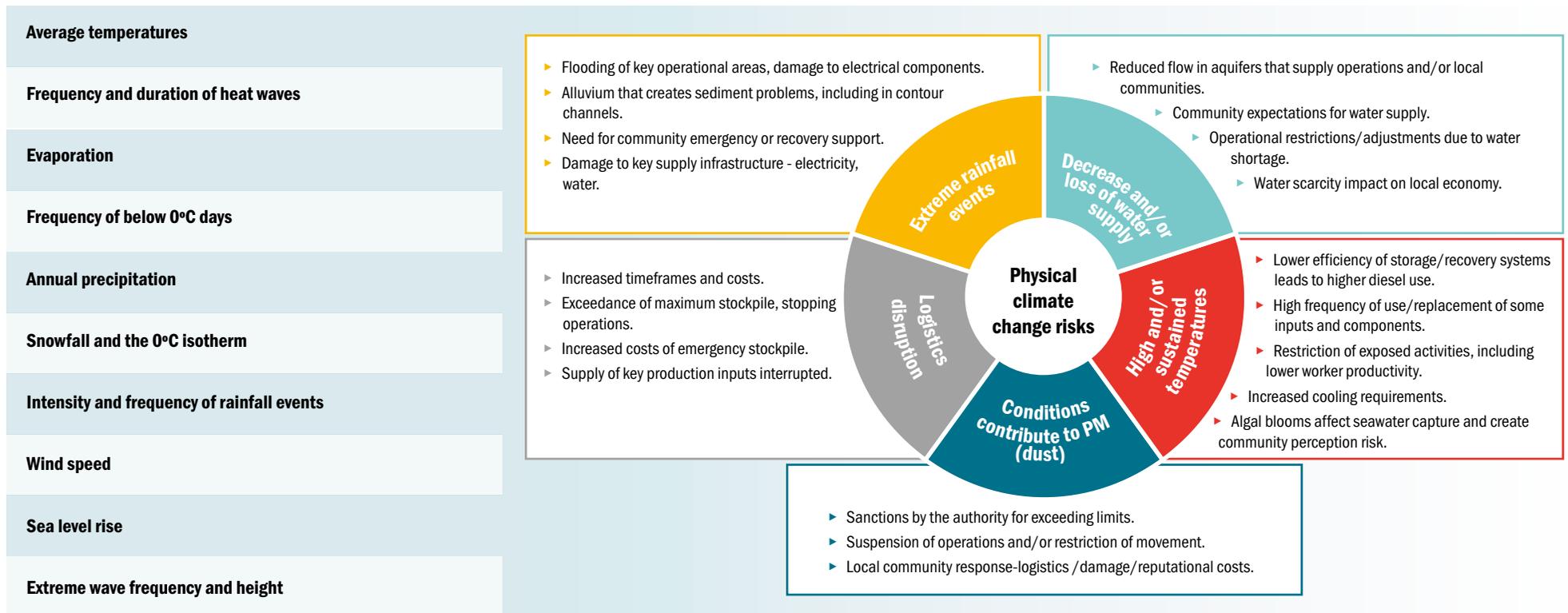


## Physical risks

Climate trends that could affect the Group's assets were identified using open-source, geospatial climate data platforms that provide data from scientifically peer-reviewed Global Climate Models (CMIP-5). This includes the Chilean government's Climate Risk Atlas that presents data on climate trends and impacts for different sectors

under the RCP8.5 scenario<sup>1</sup>. A long list of risks associated with physical climate hazards was compiled based on insights from multidisciplinary workshops with the mining and transport operation teams, which discussed the relevance of each risk and the potential impact. Using a selection of agreed climate change vectors, which

would have the most impact on the risks identified, each operation simulated the potential effect of climate changes on operating conditions that could impact copper production, operating costs and capital costs.



<sup>1</sup> For further information on the Climate Risk Atlas, see its [website](#)

## Priority Risks<sup>1</sup>

Transition and physical priority risks are outlined below. The latter have been used as a framework when assessing the potential positive and negative impacts on assets and activities.

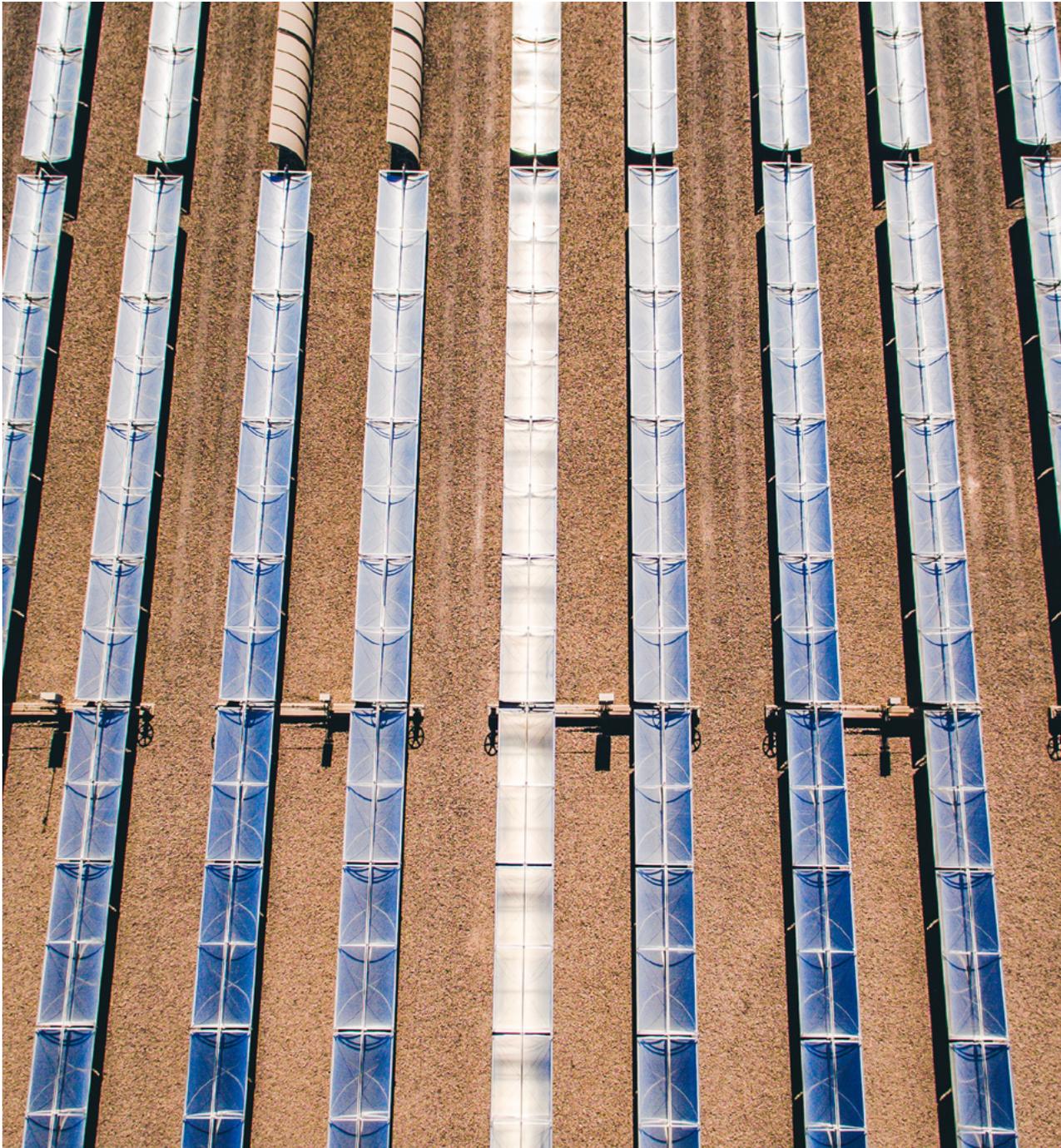
### ► Transition risks

Category	Risk	Potential cause	Potential consequence
<b>Policy &amp; Legal</b>	<ul style="list-style-type: none"> <li>▶ Carbon tax</li> <li>▶ Regulatory changes to respond to climate change</li> </ul>	<ul style="list-style-type: none"> <li>• Introduction of a carbon tax that impacts the mining sector</li> <li>• Changes in the Energy Efficiency Law (Law 21.394) and the Green Tax Law (Law 20.780)</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of competitiveness due to increased operating costs (direct and indirect)</li> <li>• Fines for not complying with legislation</li> </ul>
<b>Market</b>	<ul style="list-style-type: none"> <li>▶ Diesel price increase</li> </ul>	<ul style="list-style-type: none"> <li>• Policies to discourage diesel consumption</li> </ul>	<ul style="list-style-type: none"> <li>• Increase in costs for diesel consumption</li> </ul>
<b>Reputational</b>	<ul style="list-style-type: none"> <li>▶ Stakeholder pressures for environmentally responsible mining</li> <li>▶ Higher expectations in the areas of Influence to develop resilience to climate change</li> </ul>	<ul style="list-style-type: none"> <li>• Carbon-intensive activities increasing over time</li> <li>• Climate event with impact on local communities</li> </ul>	<ul style="list-style-type: none"> <li>• Clients choose suppliers that demonstrate greater climate ambition</li> <li>• Loss of legitimacy in the communities</li> </ul>

### ► Physical risks

Risk	Potential cause	Potential consequence
<b>Decrease and/or loss of water supply</b>	<ul style="list-style-type: none"> <li>▶ Drop in annual accumulated precipitation</li> </ul>	<ul style="list-style-type: none"> <li>• Increased demand for desalinated water/supply costs</li> </ul>
<b>Extreme rainfall events</b>	<ul style="list-style-type: none"> <li>▶ Increased intensity of rainfall events</li> </ul>	<ul style="list-style-type: none"> <li>• Damage to transport and local infrastructure</li> </ul>
<b>High and/or sustained temperatures</b>	<ul style="list-style-type: none"> <li>▶ Increased heatwave frequency</li> </ul>	<ul style="list-style-type: none"> <li>• Higher consumption of inputs or components</li> </ul>
<b>Particulate matter</b>	<ul style="list-style-type: none"> <li>▶ Dry conditions, winds</li> </ul>	<ul style="list-style-type: none"> <li>• Suspension of operations and/or restriction of movement</li> </ul>
<b>Logistics disruption (inbound or outbound)</b>	<ul style="list-style-type: none"> <li>▶ Frequency of swells/ extreme waves</li> </ul>	<ul style="list-style-type: none"> <li>• Impact on shipping deadlines and costs</li> </ul>

<sup>1</sup> The full list of climate-related risks and opportunities identified for physical and transition climate changes can be found in our [2021 TCFD Progress Report](#).



## Opportunities

We are also monitoring and exploring opportunities related to investment in mitigation to decarbonise our operations and achieve our carbon reduction targets. We have identified multiple opportunities for mitigation as part of our Long-Term Energy and Carbon Reduction Plan. Measures related to electromobility significantly reduce our exposure to climate change risks since, as our operations shift away from diesel technologies and become less carbon-intensive, we will reduce our exposure to potential price increases related to fossil fuel consumption. This shift will also allow us to limit any future taxes paid as a result of the introduction of carbon taxes which are being widely discussed today, albeit not implemented. We are also committed to implementing measures as we adapt to changes in our climate. Measures to enhance water security, such as investment in desalination and technology to reduce consumption through efficiency measures, create more resilient operations that can withstand the effects of climate change. This puts us in a better position to ensure sufficient water availability for our operations.

In addition, we are exploring how the transition to a climate-resilient economy could boost demand for copper as a critical mineral in low-carbon technologies. A climate-transition driven increase in the copper price could serve to balance the negative financial impacts of climate change on the Group. As part of this work, we are exploring different price scenarios to understand the potential magnitude of the impact on our business.

# Climate scenario analysis

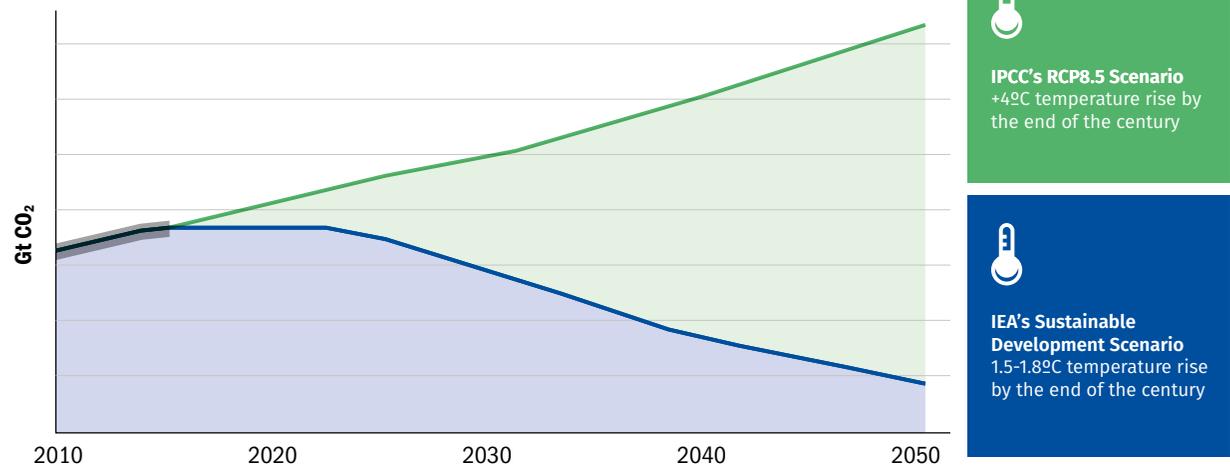
We are using climate scenario analysis to evaluate the resilience of our strategy to climate change over time. The results of the analysis provide timely and useful information on the potential impacts of value drivers for identified climate-related risks and opportunities in order to make decisions today to limit the impacts of climate change.



## Scenario characteristics

We use scenario pathways that reflect the two 'extremes' of climate change to capture the widest range of possible future outcomes.

### ► CO<sub>2</sub> emissions pathways for selected climate scenarios



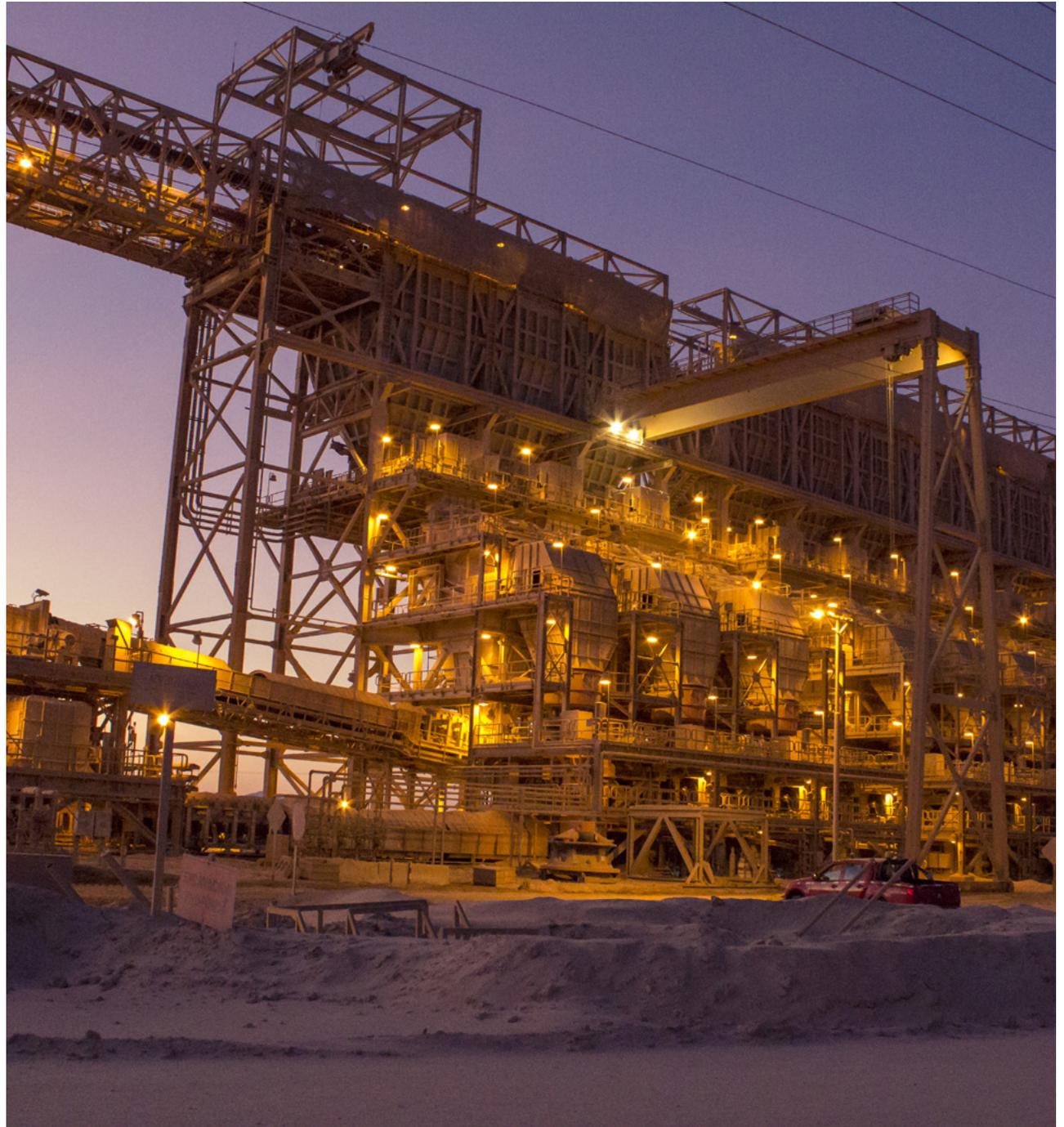
\*Indicative, not to scale.

**Transition:**  
International Energy Agency's (IEA)  
Sustainable Development Scenario (SDS)

We selected this scenario as it is one of those commonly cited by peers in our industry as well as on the FTSE100. It is also one of the most ambitious scenarios, limiting temperature rise to between 1.5°C and 1.8°C by 2100. It provides a global narrative on aggressive mitigation measures related to policy action, technology development and market changes.

In the SDS, fossil fuel prices decline due to low demand as society shifts to low-carbon and renewable energy sources. To counteract a potential rebound in fossil fuel consumption due to low energy costs, carbon taxes are introduced at higher rates and apply to a wider scope of sources.

Internally, we also benchmarked the results against alternative forward-looking scenarios based on regional projections from Chile's Energy Ministry.



## Physical: IPCC's RCP8.5

This scenario reflects a worst-case scenario for physical climate changes and hazards in which insufficient mitigation action results in a temperature increase of more than 4°C by the end of the century. This scenario is commonly used by companies and academics, implying ready availability of climate models and projections. It is also the scenario analysed by the Government of Chile in its Climate Risk Atlas and adaptation planning.

Climate changes that affect the Group's main assets under RCP8.5 include temperature rises of up to 2.3°C by 2050, with heatwaves becoming more frequent. Annual rainfall would decrease by nearly 20% by 2050 in Illapel, a town close to our Los Pelambres operation, while the intensity of heavy rainfall events may increase, particularly in northern Chile. The frequency of disruptive wave and swell events along parts of the Chilean coastline would also increase. However, it is important to acknowledge the uncertainty around these potential climate changes and the resulting effect on our operations.

The infographic on the next page shows the perceived impacts that climate change could have to our operations. The potential likelihood and magnitude of impact varies due to nuances in climate and weather systems as well as the type of activities being carried out at each location.



## Perceived potential impacts of climate change on our operations

### Centinela

Located in a desert area of great geographical breadth



1

#### Centinela Port

Perceived potential impact: Interruption of supply chain and delays on shipments.



2

#### Mine Camp

Perceived potential impact: Change in location of camp and offices due to increase in dust.



3

#### Centinela plants

Perceived potential impact: Increased evaporation from processing ponds due to increase in makeup water to offset loss, damage to infrastructure such as the hydraulic margin of DRE walls due to intense rainfall.



4

#### Centinela Mine (pit)

Perceived potential impact: Deterioration of components of equipment and heavier use of inputs (tyres, diesel).

### Antucoya

Located in a desert area with wide variations in temperature during the day



1

#### Mejillones Port

Perceived potential impact: Interruption of supply chain and delays on shipments.



2

#### Mine Camp

Perceived potential impact: Adverse working conditions for personnel, damage to external roads, high voltage transmission lines and roofs, changes in project lead times and costs.



4

#### Antucoya Mine (pit)

Perceived potential impact: Damage to equipment and quality of roads due to increase in rain and dust.



5

#### Leaching/solvent extraction and electrowinning

Perceived potential impact: Damage to equipment, roof of electrowinning bay and floor of cathodes yard.



3

#### Crushing - agglomeration

Perceived potential impact: Higher water consumption, damage to conveyor belts and equipment due to increase in dust.

### Zaldívar

Located in a desert area, at a high geographical altitude (3,000 meters above sea level), with significant daily temperature range



1

#### Supply of acid

Perceived potential impact: Shortage of acid due to potential impacts on the logistics chain.



3

#### Zaldívar Mine (pit)

Perceived potential impact: Increase in dust, damage to roads.



2

#### Zaldívar plants

Perceived potential impact: Damage to infrastructure due to rain, increase in dust and higher water consumption due to evapotranspiration.

### FCAB

Located in northern Chile with 700 km of railway lines



1

#### Mejillones Port ("Michilla Zone")

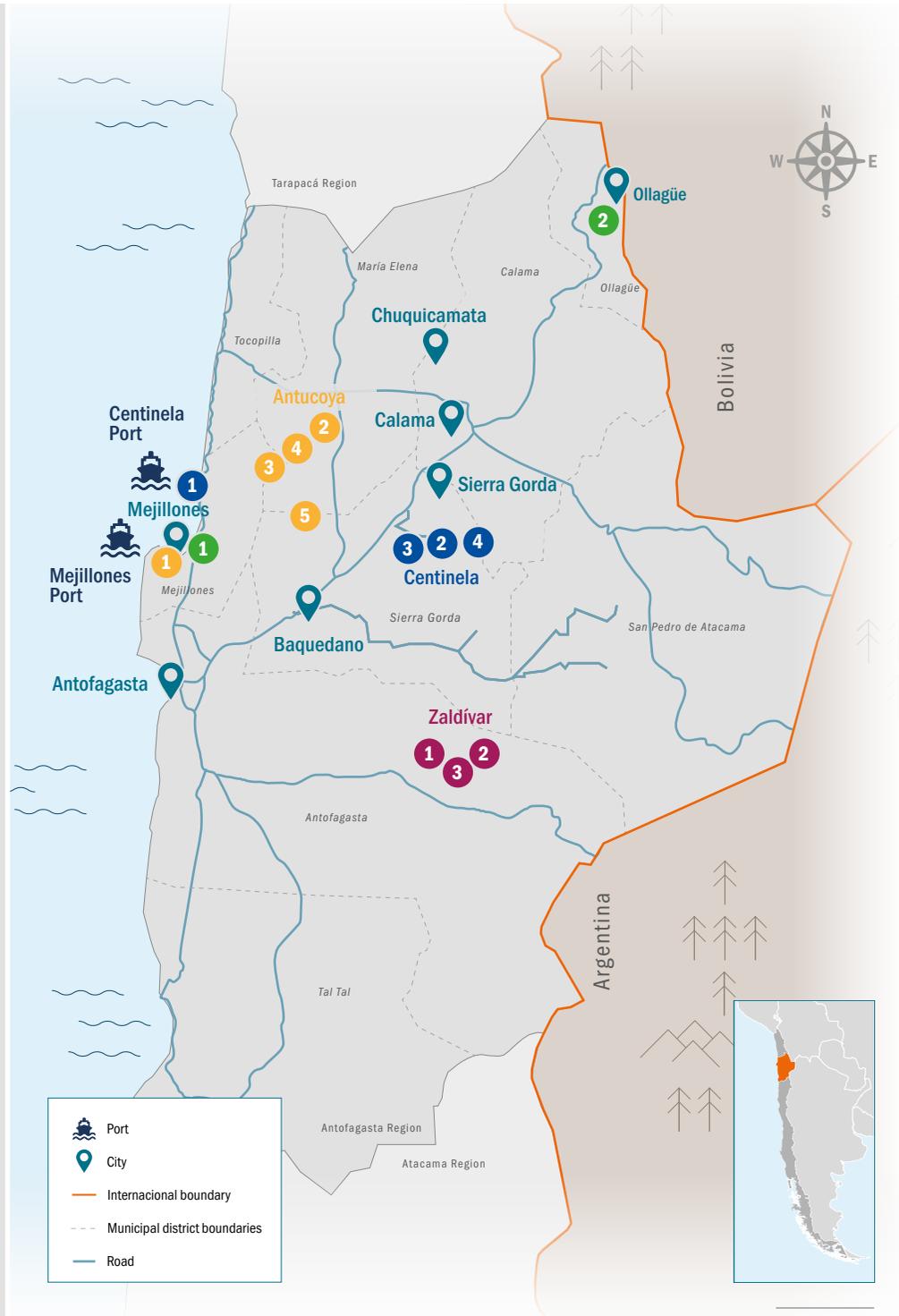
Perceived potential impact: Closure of ports, problems receiving acquisitions at ports, shortage of sulphuric acid at suppliers' terminals, restrictions on reception of freight at ports.



2

#### Ollagüe

Upper part of Ollagüe (2,260-3,660 m.s.l.)  
Perceived potential impact of rain: Impact on railway line/restrictions on traffic and operations.  
Perceived potential impact of wind: Closure and/or restricted operations at ports and terminals of clients and suppliers.



# Los Pelambres

Located in an agricultural valley of the IV region



1

## Punta Chungo Port

Perceived potential impact: Additional costs due to delays in starting loading ships (demurrage), increase in port maintenance costs.



2

## El Mauro Tailings Storage Facility

Perceived potential impact: Lack of water, non-compliance with minimum operating norms, damage to infrastructure due to unusual rain, increase in dust.



3

## Chacay Plant

Perceived potential impact: Lack of water for operation, damage to infrastructure due to unusual rain, increase in dust.



4

## Los Pelambres Mine

Perceived potential impact: Lack of water for operation, increase in dust, deterioration in water quality of Pelambres River.



## Scenario analysis

Our transition and physical climate scenario analysis assesses the financial impact of material value drivers (risk, opportunity, consequence) for each operation. The scenarios were extrapolated to the life of mine for each operation and a 25-year time horizon for the transport division. For each value driver, we calculated the annual change in cost in comparison to the current life of mine model for each operation. These impacts are integrated into our financial models and planning tools, reporting the net impact over the life of mine. Financial impacts are modelled for the following transition and physical drivers of value change:

Value Driver	Detail
<b>Transition</b>	
<b>Diesel price</b>	The overall cost of consumption of diesel will increase in a transition scenario. This affects our operations' profitability, providing an incentive for the continuous application of our Electromobility Plan (part of our Long-Term Energy and Carbon Reduction Plan).
<b>Carbon tax</b>	The carbon tax threshold may be revised to cover our direct emissions and foster reductions in greenhouse gas emissions and low-carbon behaviour. This would increase costs, favouring a technology transition.
<b>Investment in mitigation</b>	We will need to increase investment to reduce the carbon intensity of our operations and achieve our decarbonisation goals. This will result in high upfront costs and the possible early retirement of existing technology.
<b>Change in energy costs due to mitigation</b>	The switch from diesel to alternative energy sources, as laid out in our Long-Term Energy and Carbon Reduction Plan, may be favourable and unfavourable, depending on the new energy source. In general, we expect to see reduced exposure to future price increases associated with fossil fuels.
<b>Avoided carbon tax due to mitigation</b>	Replacement of diesel with low-carbon alternatives in our mining operations will reduce exposure to future price increases associated with the introduction of carbon tax.
<b>Physical</b>	
<b>Water supply</b>	Low levels of precipitation reduce water supply security, resulting in increased demand for desalinated water and higher costs in managing low availability.
<b>Frequent and extreme rainfall</b>	Intense rainfall events can damage transport and local infrastructure. As a result, we may need to temporarily halt operations, reducing our production capacity.
<b>Temperature</b>	Gradually increasing temperatures, as well as more frequent heatwaves, may increase costs related to a higher frequency of use and/or replacement of some inputs and components.
<b>Particulate matter</b>	In hot and arid conditions, there is an increased risk of air-borne particulate matter, implying health and safety concerns for both employees and local communities. As a result, we may need to suspend operations and/or restrict movement.
<b>Logistics disruption</b>	Increased intensity and frequency of wave and storm events at ports may cause disruptions and, as well as delays on imports and exports. We may also face mitigation costs in the form of increased stockpiles and storage capacity.

# Results

We use the results of climate scenario analysis to build our understanding of how climate risks may develop and impact our operations, inform our investment plans and enhance prevention and recovery control measures.

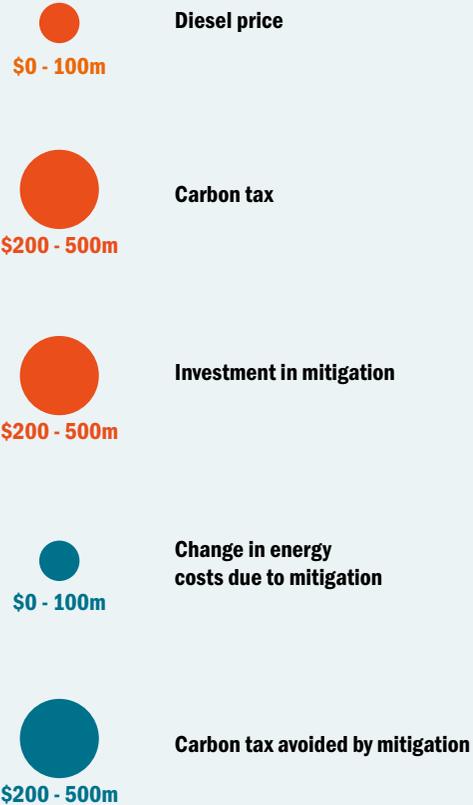
The potential magnitude of our business's exposure is similar under both an extreme physical warming scenario and aggressive mitigation scenario. Although the likelihood of value at risk is uncertain, this provides a useful reference point against which to assess and prioritise mitigation and adaptation measures to reduce our exposure and strengthen our resilience.



# Results of Climate Scenario Analysis Excluding Copper Market Opportunity

Impact calculated over the life of mine (LoM)

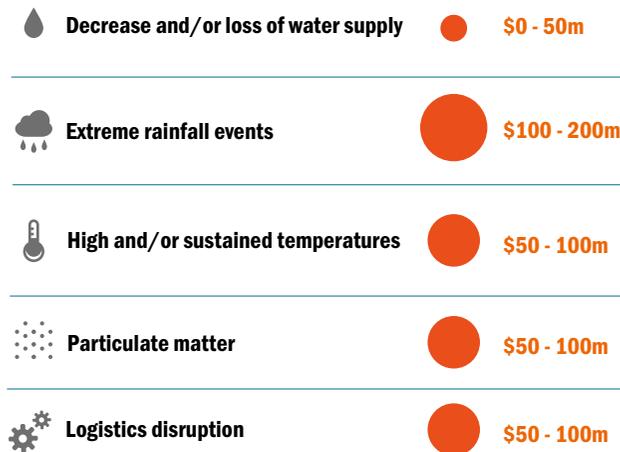
## Transition<sup>1</sup>: IEA's SDS



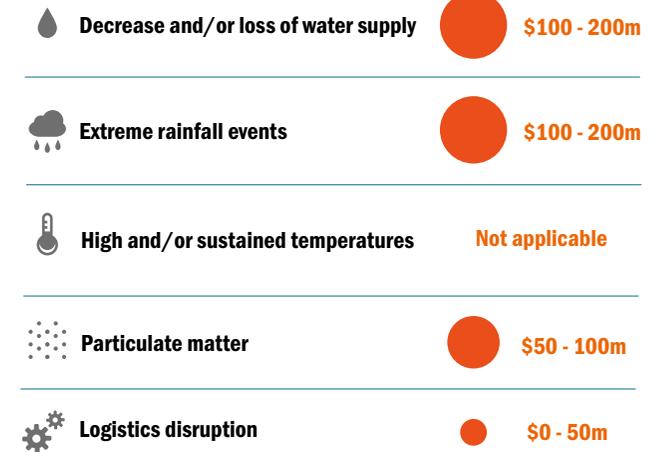
● Net Present Value Positive Exposure  
● Net Present Value Negative Exposure

## Physical<sup>2</sup>: IPCC's RCP8.5

### Northern Zone (Centinela, Antucoya, Zaldivar, FCAB)



### Central Zone (Los Pelambres)

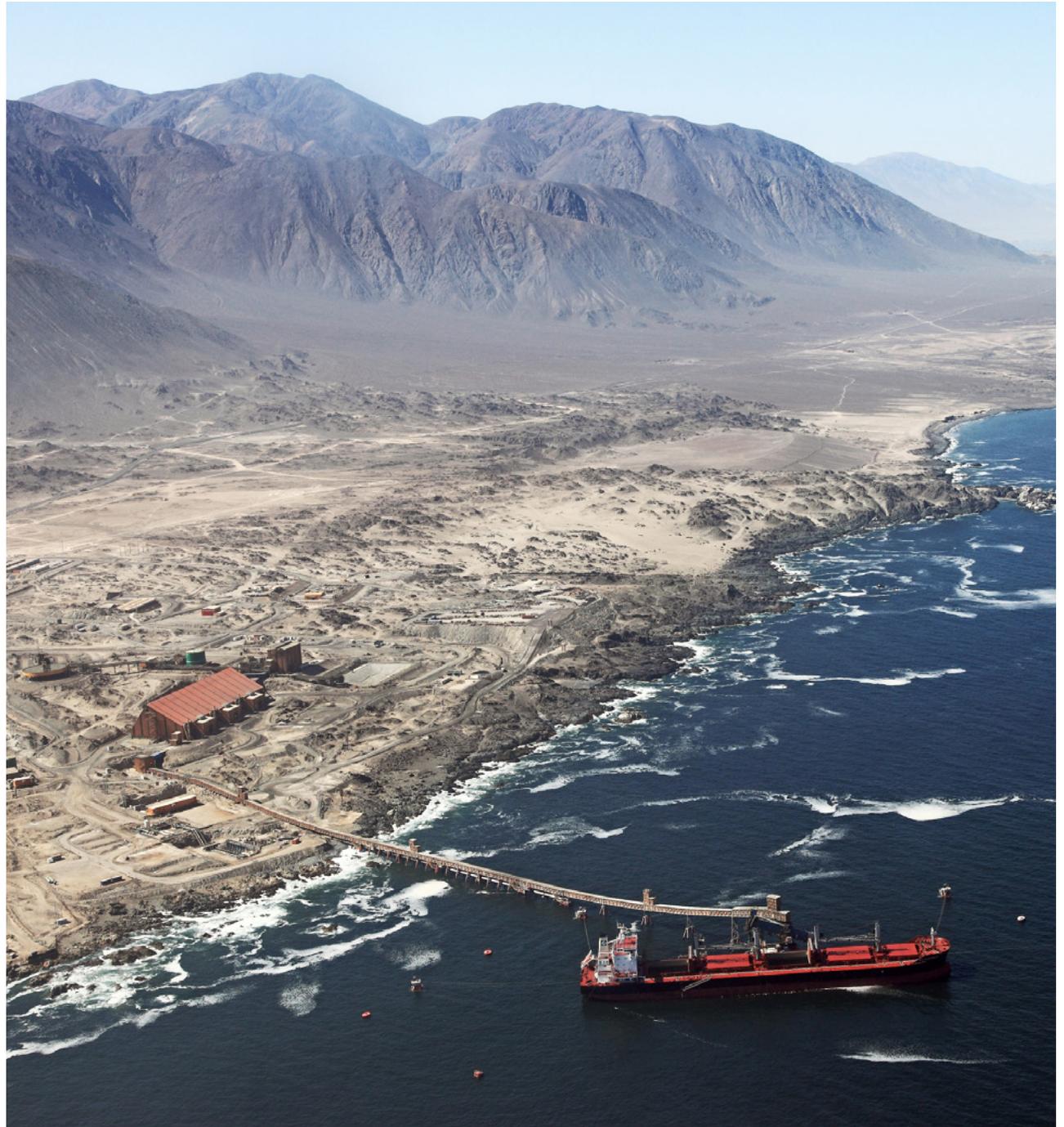


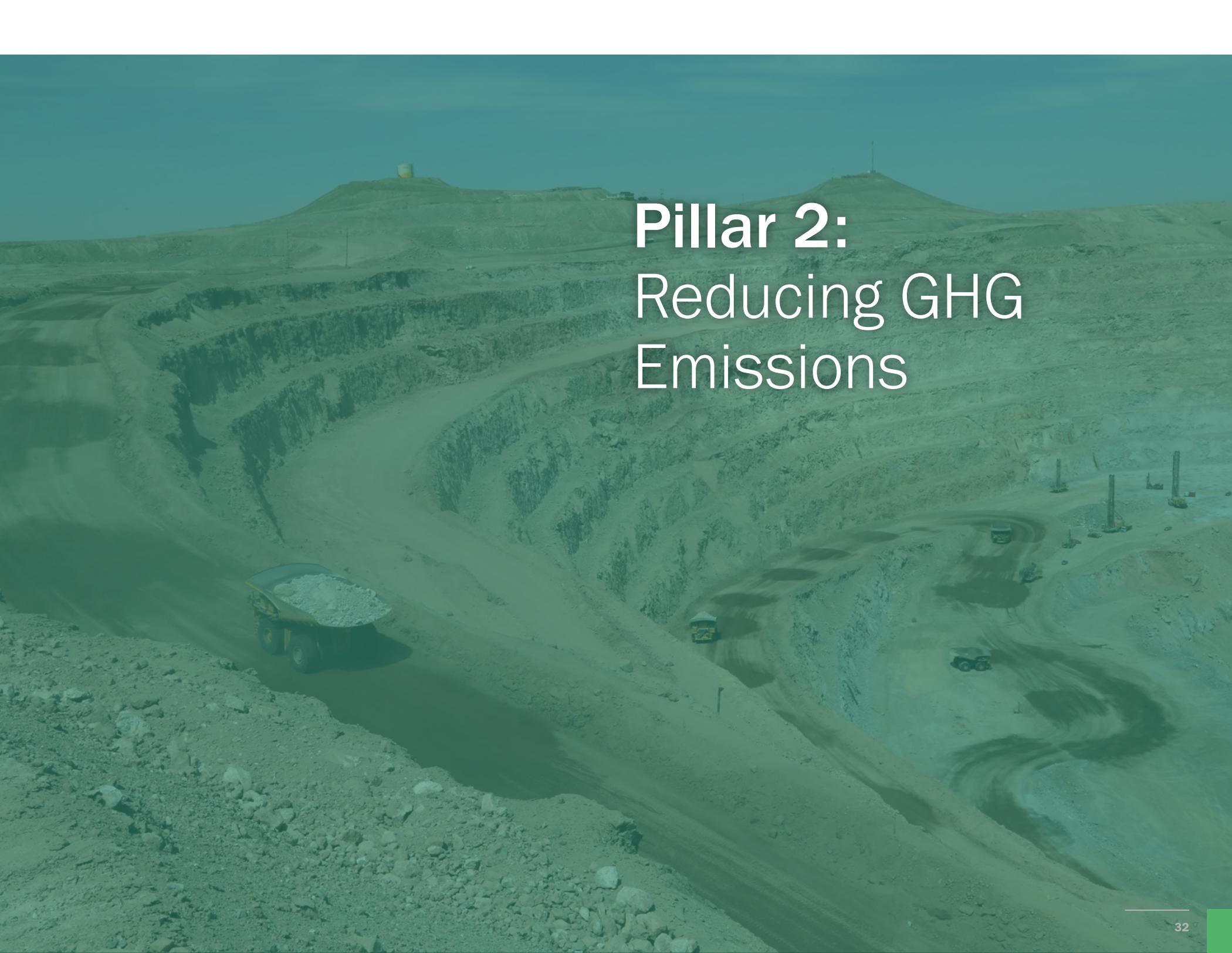
1 The positive impact of climate change on copper demand or the copper price, has not been quantified.

2 Physical changes in climate and the associated impacts vary by geography and will impact Antofagasta's operations in different ways.

## Copper Market Opportunity

Global ambition to transition to a low-carbon economy will require large investments in low-carbon technologies, including renewable energy infrastructure and the electrification of transportation systems. Copper is an excellent thermal and electrical conductor, positioning it as a critical metal for electric motors and wires that are essential in these technologies. Demand for copper is, therefore, expected to increase in the short to medium term, resulting in an increase in the copper price. Although it is difficult to isolate the effect of increased transition-related demand for copper, preliminary analysis suggests that this represents a huge opportunity for our business. In all cases, the potential positive impact greatly outweighs all other negative climate impacts. However, it is also important to stress that decarbonisation is crucial for the future of our business, regardless of any future shifts in market demand.



An aerial photograph of an open-pit mine, showing terraced levels and winding roads. Several large yellow haul trucks are visible on the roads. The entire image is overlaid with a semi-transparent teal color. The text 'Pillar 2: Reducing GHG Emissions' is written in white, bold, sans-serif font in the upper right quadrant.

# Pillar 2: Reducing GHG Emissions



## OBJECTIVE

To establish GHG emissions reduction targets and pathways, progressing towards the development of sustainable mining in line with the objectives of science and Chile’s undertakings in this field.

## Our new targets

In May 2021, we went on to announce new, more ambitious emissions reduction targets for the Group. In the framework of our Climate Change Strategy, we aim to reduce our Scope 1 and 2 emissions by 30% by 2025 compared to 2020, equivalent to the avoidance of 730,000 tCO<sub>2</sub>e. We will begin to report against this new

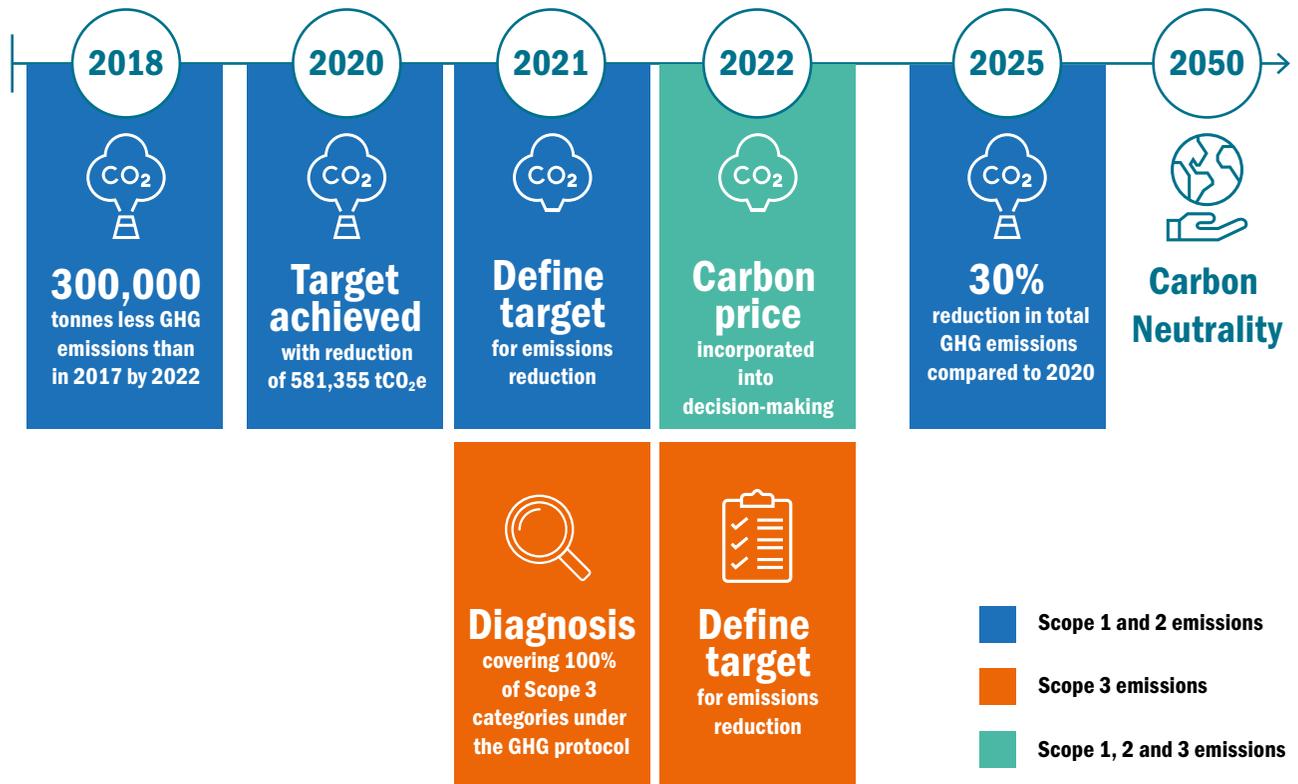
target in 2022. In addition, we have committed to carbon neutrality by 2050, in line with Chile’s national target (page 7), or earlier if the development of technology permits.

In 2017, our Mining division defined a series of emissions reduction projects and, in 2018, went on to set a target of reducing its direct (Scope 1) and indirect (Scope 2) emissions by 300,000 tonnes by 2022 compared to the 2017 baseline. We met this target in 2020, two years early, with emissions that, at 2,345,212 tCO<sub>2</sub>e, in 2020 were down by 581,355 tCO<sub>2</sub>e on 2017.

A sharp drop in the Mining division’s Scope 2 emissions in 2018 was helped by the unification of Chile’s two former separate electricity systems - the Northern Interconnected System (SING) and the Central Interconnected System (SIC) - to form the National Electricity System (SEN). This allowed lower-carbon energy from central and southern Chile to be brought to northern Chile where our Centinela, Antucoya and Zaldívar operations are located.

The further reductions we have achieved since then are the result of the gradual switch of our operations to renewables-based power supply contracts and the suite of energy efficiency measures they have been implementing.

### ► Emission targets, Antofagasta plc





## Classification of Greenhouse Gases

For the purposes of measurement, greenhouse gases (GHG) are divided into three types:

### Scope 1

Direct emissions from sources that are owned or controlled by the company, for example, emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc.

### Scope 2

Indirect emissions from the generation of purchased electricity, consumed by the company. Scope 2 emissions physically occur at the facility where electricity is generated.

### Scope 3

All other indirect emissions that are a consequence of the company's activities, but occur from sources not owned or controlled by it.

**Source:** Greenhouse Gas Protocol.

## Operational CO<sub>2</sub> emissions (tCO<sub>2</sub>e)<sup>1</sup>

	Scope 1 Direct emissions			Scope 2 Indirect emissions <sup>2</sup>			Total emissions			CO <sub>2</sub> emissions intensity tCO <sub>2</sub> e/tCu <sup>3</sup>		
	2020	2019	2018	2020	2019	2018	2020	2019	2018	2020	2019	2018
Los Pelambres	257,801	251,580	262,355	464,492	544,900	523,942	722,293	796,480	786,297	2.01	2.19	2.20
Centinela	492,496	448,890	453,898	542,020	539,300	563,101	1,034,516	988,190	1,016,999	4.19	3.57	4.10
Zaldívar	152,340	140,623	141,475	162,688	192,862	180,109	315,028	333,485	321,584	3.27	2.87	3.40
Antucoya	152,577	152,231	168,490	120,087	114,337	123,353	272,664	266,568	291,843	3.44	3.71	4.04
Corporate offices	108	106	1 <sup>4</sup>	603	825	1,189	711	931	1,191	-	-	-
<b>Mining division</b>	<b>1,055,322</b>	<b>993,430</b>	<b>1,026,219</b>	<b>1,289,890</b>	<b>1,392,224</b>	<b>1,391,694</b>	<b>2,345,212</b>	<b>2,385,654</b>	<b>2,417,914</b>	<b>3.19</b>	<b>3.10</b>	<b>3.33</b>
Transport division	88,936	96,854	99,400	858	1,118	1,224	89,794	97,972	100,624	13.93	15.20	16.59
<b>Total</b>	<b>1,144,258</b>	<b>1,090,284</b>	<b>1,125,619</b>	<b>1,290,748</b>	<b>1,393,342</b>	<b>1,392,918</b>	<b>2,435,006</b>	<b>2,483,626</b>	<b>2,518,538</b>	<b>-</b>	<b>-</b>	<b>-</b>

<sup>1</sup> Further information on our CO<sub>2</sub> emissions can be found on the Carbon Disclosure Project website ([www.cdp.net](http://www.cdp.net)).

<sup>2</sup> Generator certification, associated with the switch to renewably-generated electricity at Zaldívar, has not been validated, pending the necessary local regulation. As a result, we continue to use the average emissions factor of Chile's electricity system to calculate the emissions associated with our power consumption in 2020.

<sup>3</sup> Tonnes of CO<sub>2</sub> equivalent per tonne of copper produced or per tonne transported in the case of the Transport division.

<sup>4</sup> The main category assessed for Scope 1 emissions in our corporate offices did not register activity during 2018.

# Scope 1 emissions

These are principally the result of the use of diesel for mine haulage and to provide the heat required in some mineral treatment processes.

Our ultimate aim is to eliminate diesel consumption at our operations, moving gradually to lower-carbon alternatives. We are focusing on large mine haulage trucks, which represent around 70% of our Scope 1 emissions, using technology based on electric batteries and green hydrogen fuel cells.

Chile's advantageous conditions for the generation of solar and wind energy mean that it has the potential to become a major producer of green hydrogen and we will be looking to support the country's development in this field. In January, we became the first mining company to join H<sub>2</sub> Chile, the Chilean Hydrogen Association, and we have a seat on its board of directors.

## Mine haulage

Out of the emissions generated by the Mining division's use of diesel, mine haulage trucks (CAEX) account for two-thirds as compared, for example, to just 6% in the case of loading equipment. Our studies indicate that the solution we adopt to eliminate the use of diesel in these trucks will vary by operation, depending principally on their topography and mining development. We are studying different technologies, including the use of trolleys, battery-powered trucks and green hydrogen, without ruling out other options such as synthetic fuels.

In 2020, we drew up an Electromobility Roadmap of which haulage trucks were a key focus. Building on this roadmap, we are now preparing an Electromobility Plan, with concrete actions starting in 2022.

In 2022, we expect to be testing a prototype of a fuel cell and battery powertrain propulsion system, developed by the Hydra Consortium, at Centinela ([page 40](#)). The tests will serve to assess its behaviour and performance under real mine conditions (i.e. high altitude and dust).

Other key initiatives include:

- ▶ **CASE project.** In 2022, we will be co-financing a pre-feasibility study on the use of electric trucks in Antucoya, carried out by the Centre for the Sustainable Acceleration of Electromobility (CASE), a technological consortium led by the University of Chile, the Energy Sustainability Agency and the Mario Molina Centre.
- ▶ **Charge On Challenge.** We are one of a group of mining and related companies that has set this innovation challenge for the development of battery-charging solutions for large electric off-road trucks of at least 220 tonnes.
- ▶ **Hydragen and Infinity projects.** These projects at Centinela and Los Pelambres, respectively, are testing the effectiveness of injecting a small amount of hydrogen into the diesel used by the trucks as a way to reduce emissions, expecting to reduce fuel consumption by about 5%.



## Heating

We use diesel to heat water for electrowinning processes. In 2020, as a transitional measure, Antucoya and Centinela switched to liquefied natural gas (LNG) in their boilers. As a result, in the first nine months of the year, Centinela and Antucoya avoided the emission of 1,426 tCO<sub>2</sub>e and 656 tCO<sub>2</sub>e, respectively.

Diesel is also used to generate hot air to accelerate the leaching process. In both this case and in the heating of water for electrowinning, we are currently evaluating cleaner alternatives, including different types of solar energy.

## Small vehicles

Our Electromobility Plan also includes small vehicles. As yet, the market offers few small vehicles able to withstand mine conditions (altitude, temperature and dust). However, we have been testing an electric bus at Centinela since 2020 and have recently also incorporated an electric SUV there. In addition, Antucoya's new contract for the transport of personnel envisages the incorporation of an electric bus during 2022.

In mid-2021, Fundación Minera Los Pelambres, the operation's foundation, incorporated three electric SUVs into the fleet of vehicles it uses for its work. The initiative implies the avoidance of 11.28 tCO<sub>2</sub>e.

## Transport division

Our freight transport operation, Ferrocarril de Antofagasta a Bolivia (FCAB), already contributes to the reduction of transport-generated GHG emissions since it provides primarily railway services. This gives it an advantage and competitive edge that will gain in commercial value as efforts to stem climate change intensify.

The company is also working to reduce the emissions of its railway service. Over the past three years, it has replaced 19 locomotives, equivalent to 25% of its fleet, with more eco-efficient alternatives and, starting in 2025, aims to gradually convert them all to green hydrogen.

The initiative was selected for support from Aceleradora H2V, the accelerator established by the Energy Sustainability Agency, a Chilean foundation, to promote green hydrogen projects in different sectors of the economy. FCAB was the only railway selected for this support. The company has already signed a memorandum of understanding with a potential local green hydrogen supplier.



## Scope 2 emissions

Over the past few years, all our mining operations have renegotiated their power purchase agreements (PPAs), switching from conventional sources - principally coal - to renewables. In July 2020, Zaldívar became the first operation to use 100% renewable energy and, in 2020, 19.4% of the Mining division's electricity was supplied from renewable sources.

In January 2022, Antucoya and Centinela will also switch to 100% renewably-generated electricity and, later in the year, they will be followed by Los Pelambres, with the exact date depending on the ramp-up of a hydroelectric project. As a result, we expect that, by end-2022, our mining operations will be using only electricity from renewable sources.

Zaldívar's switch to renewably-generated electricity in July 2020 meant a reduction of 67,615 tCO<sub>2</sub>e in our Scope 2 emissions in 2020. However, in accordance with the GHG Protocol Standard, this is not reflected in our published emissions figures. For this, the generators' certification must be validated and the necessary local regulation is not yet in place. As a result, we continued to use the electricity system's average emissions factor to calculate the emissions associated with our power consumption in 2020.



## Scope 3 emissions

We are currently in the process of evaluating our Scope 3 emissions. The GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard identifies 15 categories of Scope 3 emissions of which eight correspond to upstream activities, such as the production of the goods and services a company acquires, and seven to downstream activities such as transportation of a company's end product to its clients.

We are in the process of calculating our Scope 3 emissions in 2020, taking into account all the upstream categories and the three applicable downstream categories (downstream transportation and distribution, processing of sold products and investments). In the upstream, we are working with suppliers to learn more about the measures they are implementing with regard to climate change ([page 58](#)). Measurements will continue in 2022 when we also plan to establish an inventory of Scope 3 emissions and a target for their reduction.

In one initiative related to our Scope 3 emissions, we have agreed to participate in evaluating the feasibility of HyEx, a project led by energy multinational Engie and a Chilean explosives company, Enaex, to produce green ammonia in northern Chile. This would, in turn, be used to make ammonium nitrate, which is used for blasting in the mining industry and could also potentially serve as fuel for trains and ships.



# Internal carbon price

Carbon pricing is a key tool for reducing energy use and fostering a shift to clean fuels. As a result, we are introducing an internal carbon price that we will be using not only in procurement but also in planning and project evaluation and for financial purposes.

It is being used in drawing up our budget for 2022 and, as from January 2022, will be a factor, along with other new ESG criteria, in the economic evaluation of bids from suppliers. This is additional to the energy efficiency parameter used in their technical evaluation since mid-2020.

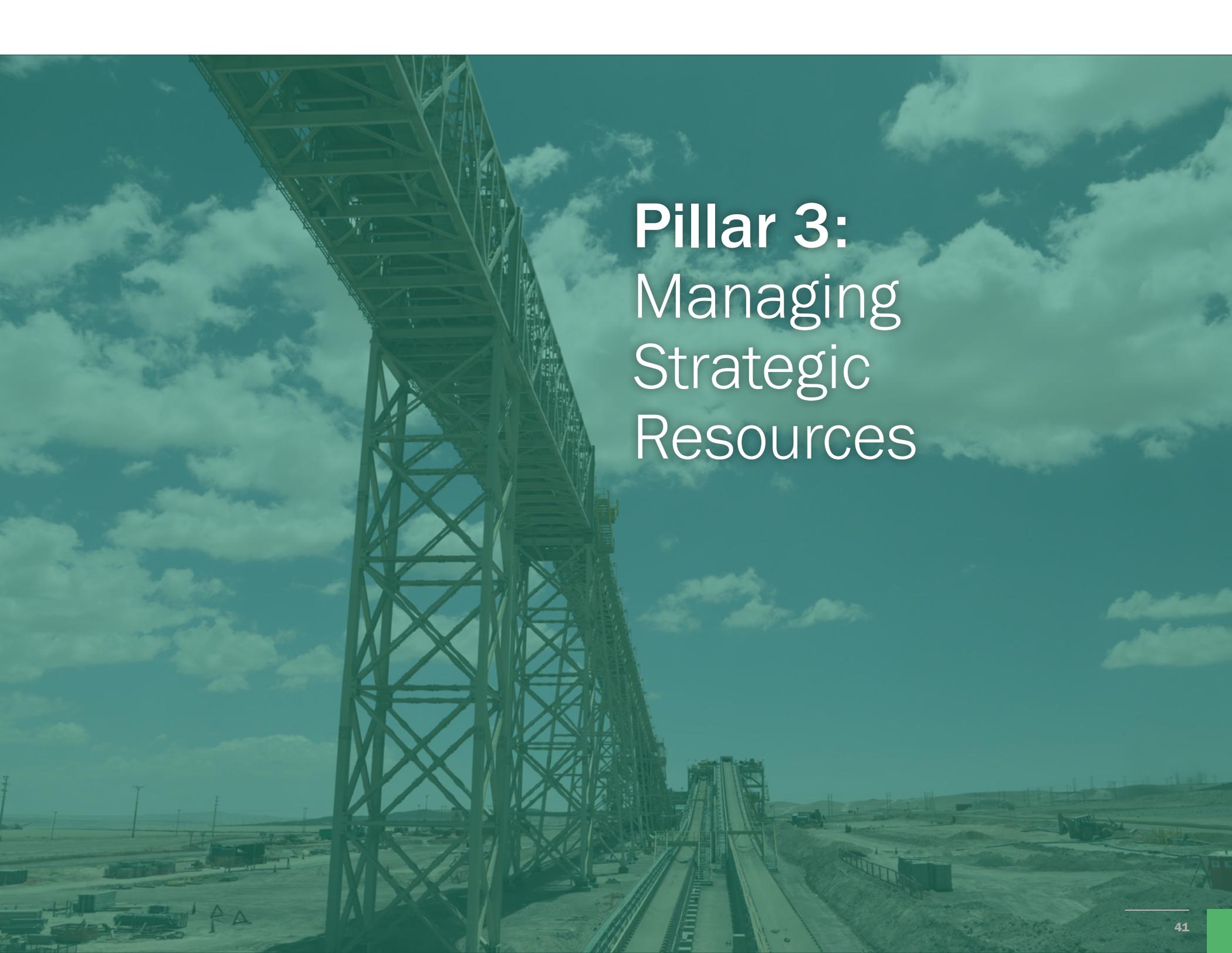
We are aware that some of our SME suppliers may require guidance in adapting to this innovation. However, since they tend to provide us with services, rather than goods, they will be less affected. Moreover, given that they are mostly local, the carbon price will give them an edge over larger, more distant suppliers, with their logistics footprint.

## Centinela to test hydrogen haul truck project

Work to switch mine haulage trucks from diesel to hydrogen will take a major step forward in 2022 when the Hydra Consortium tests a fuel cell and battery powertrain prototype at Centinela. The tests will provide valuable information about the technology's performance under real mining conditions. In addition, they will help to establish safety protocols for hydrogen use at scale in mining, which will be vital for the fuel's successful deployment.

Hydra was formed in mid-2020 when energy multinational Engie joined forces with Mining3, a leading mining industry research organisation, to create hydrogen solutions for the mining industry. They were subsequently joined by other companies - including, most recently, Antofagasta Minerals - and obtained a grant of 252 million Chilean pesos from CORFO, the Chilean government's economic development agency.

In November 2020, the government unveiled a National Green Hydrogen Strategy as a new way of taking advantage of the country's abundant and competitively-priced renewable energy. The Strategy aims to position Chile as the world's cheapest green hydrogen producer by 2030 and one of the world's three main exporters by 2040. The mining industry is expected to play a key role in the new industry's development by providing an important domestic market ahead of scale-up into exports.



# Pillar 3: Managing Strategic Resources



## OBJECTIVE

To ensure the supply and efficient management of strategic resources, such as water and energy, considering opportunities for innovation and the impacts on the environment and communities as well as technological advances and regulatory changes.

In the context of our Climate Change Strategy, we have created a new Strategic Resources area to provide centralised management of the Group's water and energy resources. Officially launched on 1 January 2021, it forms part of our Strategy and Innovation Vice Presidency and its mission is to ensure our supply of water and energy.



# Water

For water, this pillar specifies its objectives as follows:

- ▶ **Evolution of the water matrix.** Strengthen the Group's strategy for reducing its use of continental water in areas where water is scarce, establishing targets and actions that take into account the result of the analysis of climate scenarios.
- ▶ **Efficiency, recirculation and reuse measures.** Strengthen efficiency in the use of water and other strategic resources, improving their recirculation, recovery, reuse and protection in the company's areas of influence.

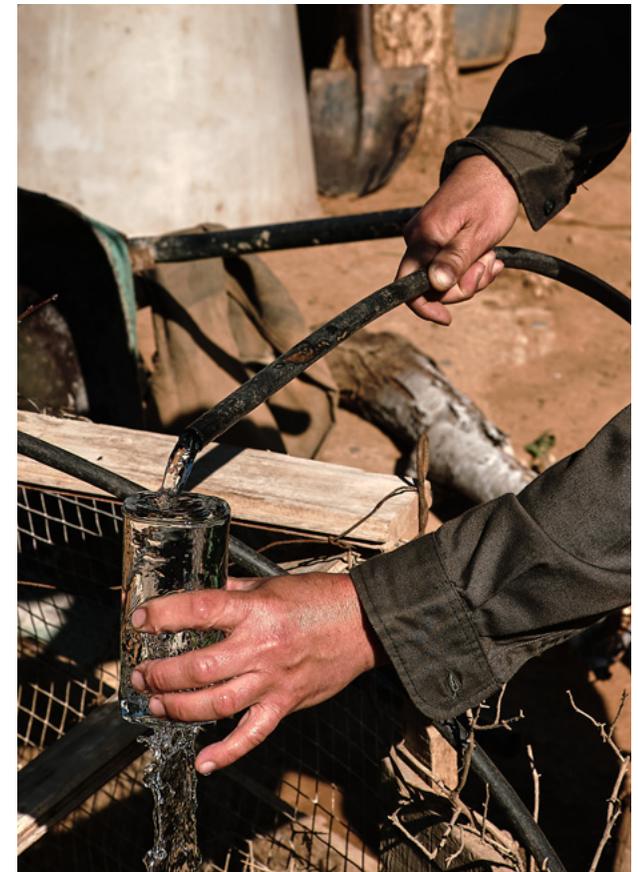
Water consumption and efficiency in the use of this strategic resource have long been at the forefront of the Group's management of its Mining division. Three of its four operations are located in the Atacama Desert and the fourth, Los Pelambres, is in an area suffering a severe drought that now dates back 12 years.

Antofagasta Minerals pioneered the use of raw seawater in the Chilean mining industry, beginning in the 1990s at Minera Michilla of which the Group subsequently divested. It then went on to use seawater at Minera Esperanza, now part of Centinela, and, subsequently, Antucoya.

In 2020, seawater accounted for 43% of the Mining division's water consumption, led by Antucoya (97%) and Centinela (86%) and, provided the required permitting is in place, our target is for seawater and reused or recycled water to supply 90% of the division's consumption by 2025.

- **Los Pelambres desalination plant.** Los Pelambres will begin to switch from continental water to seawater in the second half of 2022 when it expects to complete construction of the first 400 l/s stage of a desalination plant on the coast of the Coquimbo Region to supply the operation with industrial water. The plant's capacity will subsequently be doubled to 800 l/s by 2025. Los Pelambres will then cease withdrawals from the Choapa River and wells in the upper part of the Choapa Valley for operational purposes and desalinated and reused or recycled water will account more than 90% of its total consumption. This will free some 500 l/s of water, the possible uses of which will be addressed through processes of dialogue between Los Pelambres, the authorities and the communities.
- **Centinela wells.** Centinela currently obtains 14% of its water consumption from wells in a nearby area known as Calama Poniente. However, as from December 2022, it will cease to use these wells and, instead, increase the capacity of its seawater pumping system and its reverse osmosis drinking water plant.

Zaldívar obtains water from wells in the Atacama Salt Flat. The corresponding water extraction permits will expire in 2025 and, as part of the Environmental Impact Assessment (EIA) submitted to extend the mine's life, we are seeking to renew them until 2031.



## Water management

We are currently drawing up a specific Water Policy to complement our Climate Change Strategy. This will be supported by a Water Management Standard, which we expect to complete in the first half of 2022.

In reporting our direct water withdrawals, we apply the Practical Guide to Consistent Water Reporting of the International Council on Mining and Metals (ICMM). In addition, we report our water risk exposure in accordance with the requirements of the Water Programme of the Carbon Disclosure Project (CDP) as well as to the corresponding local authorities and other relevant bodies.

### ► Operational water withdrawals by source (ML)

		2020	2019	2018
Los Pelambres	<b>Total</b>	<b>27,847</b>	<b>21,633</b>	<b>25,308</b>
	Surface water	19,481	13,898	16,534
	Groundwater	8,358	7,726	8,766
	Supplied by third parties	9	9	9
Centinela	<b>Total</b>	<b>27,178</b>	<b>26,369</b>	<b>27,036</b>
	Seawater	23,316	22,602	23,039 <sup>1</sup>
	Groundwater	3,862	3,356	3,136
	Supplied by third parties	-	410	861
Antucoya	<b>Total</b>	<b>5,923</b>	<b>5,804</b>	<b>6,129</b>
	Seawater	5,720	5,623	5,910
	Groundwater	204	181	219
Zaldívar	<b>Total</b>	<b>7,015</b>	<b>7,015</b>	<b>7,229</b>
	Groundwater	7,015	7,015	7,229

<sup>1</sup> The figure of 23,039 ML corrects an originally reported figure of 24,538 ML for this year due to double accounting of water withdrawn from this source.

## Water efficiency

Water losses at our operations occur principally because of entrained water in tailings or due to evaporation from the tailings storage facilities (TSFs) and leach pads. Loss through evaporation will, moreover, be aggravated by higher temperatures as a result of climate change.

The measures we are taking to reduce these losses and increase reuse rates include:

- ▶ **Los Pelambres.** This operation is working to increase the percentage of solids in the tailings leaving the concentrator, without significantly affecting their flow through the 60 km pipeline to the TSF. We have successfully raised this percentage of solids from a historical average of around 57% to just over 60%, with each percentage point representing a saving of approximately 30-40 l/s. Los Pelambres also plans to test a MudMaster, a type of tractor that can be used on a TSF to compact the tailings and squeeze out the water. In addition, it is exploring the use of a chemical barrier to reduce evaporation from the surface of the TSF and ponds.
- ▶ **Centinela.** For a decade now, Centinela has been using thickened tailings technology, which saves water by permitting concentrations of solids of up to 66-67%. It is also exploring both physical and chemical barriers to reduce evaporation. In 2020, the replacement of 15 km of the 20-year-old pipe from the Calama Poniente wells to the mine site eliminated losses equivalent to some 4% of annual consumption.



# Energy

For energy, this pillar specifies its objectives as follows:

- **Low-carbon or carbon-neutral energy supply:** Give priority to supply from renewable energy sources and fuels that are low or neutral in emissions, establishing targets aligned with options in the energy market and the GHG emissions pathway.

In the case of energy, this pillar refers not only to the type of energy used but also the efficiency with which it is employed, taking advantage of opportunities created by innovation and the market. This is reflected in our portfolio of energy efficiency projects, covering both electricity and diesel.

Projects due to be implemented in 2022 include the installation of two variable frequency drives (VFD) for water pumps at Los Pelambres. This follows the successful installation of a first VFD in 2020, which represented a saving of 1,548 MWh/year and the avoidance of 592 tCO<sub>2e</sub>/year in emissions in 2020.

## ► Key Energy Efficiency Initiatives

Description	Saving (Jan-Aug 2021)	GHG emissions avoided (Jan-Aug 2021)
Performance improvements in SAG mill, Los Pelambres	25,305 MWh	10,765 tCO <sub>2e</sub> <sup>1</sup>
Reduction in haul truck diesel consumption, Centinela	4,680.8 m <sup>3</sup>	13,996 tCO <sub>2e</sub>
Improvements in crusher use, Antucoya	12,965 MWh	5,556 tCO <sub>2e</sub>
Performance improvements in water pumping to site, Zaldívar	1,898 MWh <sup>1</sup>	835 tCO <sub>2e</sub>
Change to LED lighting, Los Pelambres	1,601 MWh	689 tCO <sub>2e</sub>
Performance improvements in gravel unloading, Zaldívar	1,156 MWh	504 tCO <sub>2e</sub>

<sup>1</sup> Jan-July 2021.

## Energy management

In line with the new Chilean Energy Efficiency Law, we are currently drawing up an Energy Policy, with objectives, targets and action plans. In 2022, we will also be strengthening our energy management system in line with the new requirements.

We are adding new functions to our Energy Portal, which we launched in mid-2020 to improve visualisation of the information used to make management decisions. It shows the energy (electricity and diesel) used by the different processes at our four mining operations and the corresponding Scope 1 and 2 emissions. We are now in the process of incorporating energy intensity indicators, the status of energy efficiency initiatives and our progress towards our 2025 emissions reduction target.

## Public-private alliances for water sustainability

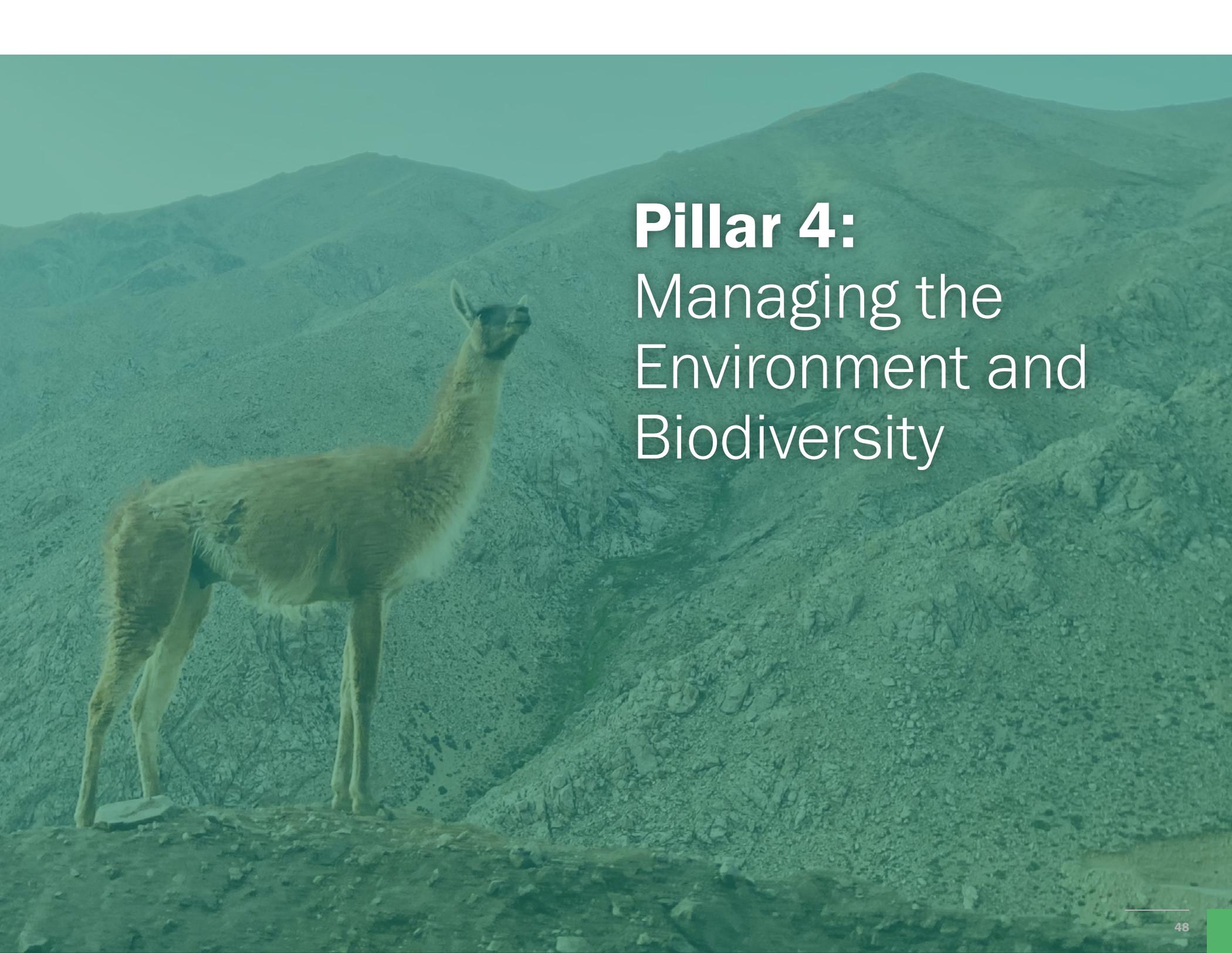
In line with our view that the state, academia, civil society and companies must work together to address the challenges posed by climate change, we are a partner in two major public-private initiatives related to water sustainability. They target both the Coquimbo Region in particular and the country in general.

We are co-financing the Quitai Anko research consortium, which won a bid in 2019 to implement a five-year programme to develop sustainable solutions to water-related challenges. The project, led by the University of La Serena, is initially focusing on solutions for the Choapa Valley, where Los Pelambres is located, but with a view to their subsequent application in the rest of the Coquimbo Region and the neighbouring Atacama and Valparaíso Regions.

The consortium has five main lines of work that include the development of a model to monitor the water balance in the Choapa Valley's aquifer and an integrated information system for the management of rural drinking water. It also envisages a pilot project to assess the feasibility of aquifer recharge.

In late 2020, Antofagasta Minerals joined forces with the Catholic University of Chile (UC) to create the Antofagasta Minerals Chair of Water Sustainability. Established through an innovative use of the endowment system, which is itself still relatively new in Chile, it is designed to build knowledge and human capital in a critical area for Chile's resilience to climate change.

Initially, the topics identified include seawater desalination with its environmental and social implications, models for sustainable basin management and an area known as socio-hydrology, which focuses on the interaction between water resources and communities. Outreach will be another important part of the Chair's activities and a webinar in October 2021, given by an expert in hydrology and environmental analysis from Uppsala University, Sweden, will be followed by a conference on water sustainability in March 2022.



**Pillar 4:**  
Managing the  
Environment and  
Biodiversity



## OBJECTIVE

To maintain environmental management aligned with the operations' undertakings, striving to protect the environment and biodiversity and taking advantage of the opportunities afforded by nature-based solutions (NbS) and other innovations to advance in the reduction of emissions, adaptation to climate change and the Group's overall sustainability.

This pillar of our Climate Change Strategy envisages two key areas of work:

- ▶ **Nature-based solutions for the capture of CO<sub>2</sub>.** Explore and innovate in NbS projects that contribute to the Group's emissions reduction pathway in the medium and long term, improving environmental management and contributing to protection and care for biodiversity.
- ▶ **Nature-based solutions for adaptation to physical risks.** Explore and innovate in NbS initiatives to address adaptation to both acute and chronic physical risks, corresponding to the different climate change scenarios projected by the Group.



We recognise the role of Nature-based solutions in our pathway to carbon neutrality and their importance for climate change adaptation and biodiversity. Our approach to manage NbS is incorporated in our Environmental Management Model and in our Biodiversity Standard.

## Environmental management

Through environmental management, we seek to avoid, control and mitigate environmental impacts and, if they occur, compensate duly. We strive constantly for efficiency in the use of natural resources. We believe that this is the way to achieve the long-term sustainable development of our business and the communities close to our operations.

We have a Sustainability Policy and an Environmental Management Model through which to incorporate environmental considerations into our operations, exploration activities and projects.



## Biodiversity Standard

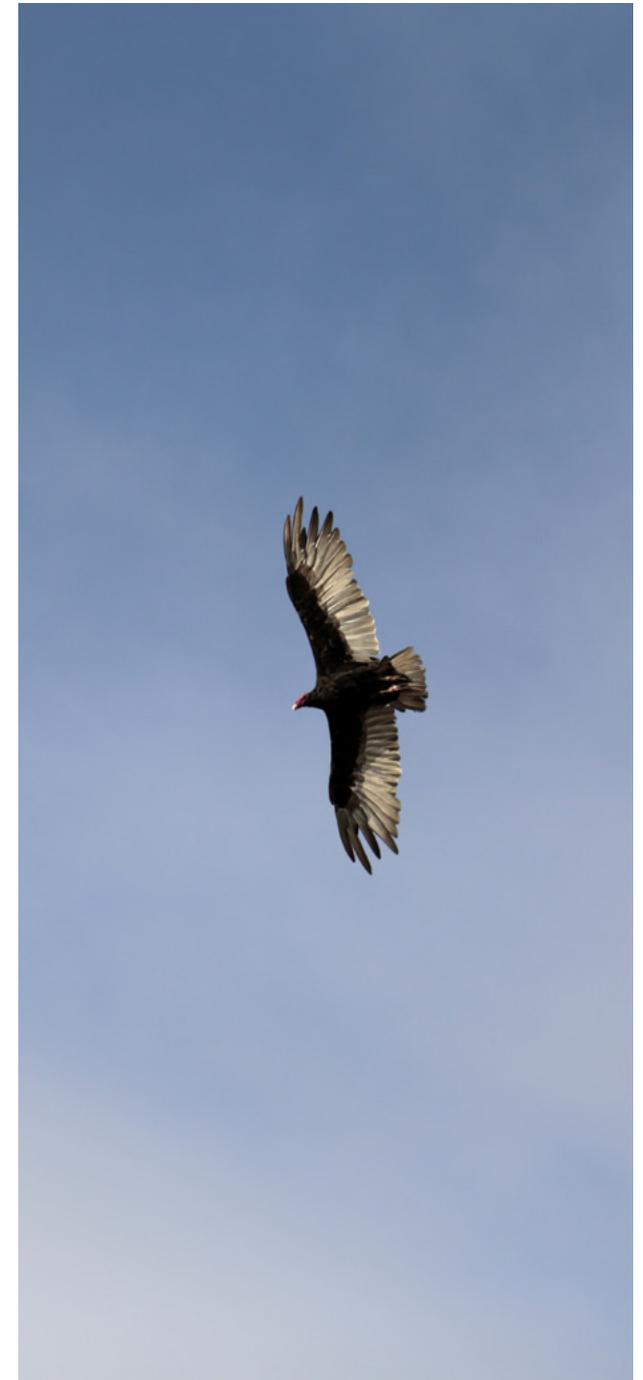
Since 2016, we have applied a Biodiversity Standard that seeks not only to ensure net zero loss of biodiversity but also to generate additional benefits or, in other words, more than compensate for any negative impact. The Standard is aligned with the position statement on Mining and Protected Areas of the International Council on Mining and Metals (ICMM).

We are in the process of updating the Standard, based on best international and Chilean practices, guidelines and standards. One of its guiding principles will be to:

- ▶ Promote adaptation to and mitigation of climate change and seek synergies with biodiversity management measures, aligning this with the Climate Change Strategy.

Antofagasta Minerals participates actively in the work and other activities of the ICMM, including its Biodiversity Working Group.

Our model focuses on achieving leadership in environmental management by the business, based on traceable data, the management of operational risks, including those related to climate change, with environmental consequences and due management of our requirements.



# Nature-based Solutions

## Protected areas

Los Pelambres has four nature sanctuaries: Laguna Conchalí, Monte Aranda, Quebrada de Llau-Llau and Cerro Santa Inés. All are officially recognised by the state of Chile and one - Laguna Conchalí - is recognised under the international Ramsar Convention on Wetlands.

Including its nature sanctuaries and reforested areas, Los Pelambres protects and conserves a total area of more than 27,000 hectares, equivalent to seven times the area occupied by the mine and its related installations.

In 2015, Los Pelambres carried out an initial study of the carbon absorption capacity of part of its protected areas and this was followed by a second study in 2019, providing valuable information about a type of ecosystem that has been little studied as a carbon sink. Further theoretical studies are currently underway.

The management plans that Los Pelambres has in place for its four nature sanctuaries all take climate change into account. In the case of the Laguna Conchalí wetland, climate change is treated as a direct threat, due to the impact on water availability. In response, one of the management plan's conservation priorities is to gather scientific evidence about its vulnerability and likely impacts in order to be prepared to adopt the corresponding measures. Under the plan, the risk to the sanctuary will be evaluated every other year according to different climate scenarios.



## Key Biodiversity Initiatives

In 2020, we drew up a portfolio of biodiversity initiatives that have been implemented or are under implementation by our operations and projects. They include activities to protect species as well as outreach and research initiatives.



### ► Key Biodiversity Initiatives

#### Protection of species

Rumpa de Iquique	In the area known as Devil's Ravine on the coast of the Atacama Desert, Centinela is protecting and seeking to propagate this slow-growing cactus which, depending on the particular area, is classified as vulnerable or endangered.
Chilean palm	Monte Aranda, one of the protected areas managed by Los Pelambres, contains an important population of the Chilean palm, an icon of the landscapes of central Chile, that is classified as vulnerable.
Guayacán	Los Pelambres has established a 40-hectare protection area for this small tree in one of the river basins near the operation in a bid to ensure its ongoing presence in the area.

#### Education and/or research

Environmental Education Trail, Morro Moreno National Park	In alliance with other partners that include the Catholic University of the North (UCN) and CONAF, Chile's national forest service, Antofagasta Minerals is working to develop the educational potential of this national park, located close to the port of Mejillones.
Phytostabilisation of Quillayes tailings storage facility (TSF)	In line with the operation's undertakings on sustainability, the environmental legislation in force and engagement with the communities of the Upper Choapa Valley, the plan for the TSF's sustainable closure includes its phytostabilisation, through trees that, once established, will absorb heavy metals from the deposit. This NbS-based approach is designed not only to ensure the deposit's chemical stability but also to mitigate the risk of air-borne particulate matter, with the resulting detrimental effect on air quality.
Production of native plants	As part of its environmental undertakings, Los Pelambres is reforesting some 1,000 hectares of the Choapa Province with native species and is itself producing seedlings. In 2021, it produced over 270,000 specimens of 51 different species.

#### Protection of ecosystems

Laguna Conchalí	This coastal wetland is a key staging area for migratory birds. Located just north of the town of Los Vilos, it is one of Chile's 16 Ramsar sites and is of high terrestrial and marine ecological value, due to the influence of two important eco-regions: the Atacama Desert and the Chilean Mediterranean scrub.
High Andean grasslands	Los Pelambres is responsible for protecting an area of grassland high in the Andes Mountains, above the mine. One of the challenges is to ensure a balance between its traditional use as pasture by local livestock farmers and its conservation. The flora and fauna are monitored to obtain indicators of the biodiversity found in these ecosystems.



## Greening the Atacama Desert

The High-Altitude Desert Agricultural Centre, located at our Zaldívar mine, studies and is improving the genetics of plants that are not only able to grow in the harsh desert conditions, but can also be used to produce biofuels. Known as the Green Desert project, it is a joint venture with the University of Chile.

It occupies 4 hectares of the mine site, at 3,200 metres above sea level, and the species cultivated include the Chilean algarrobo, the atriplex and the jojoba. They grow as shrubs that are pruned and the biomass transformed into pellets or, as in the case of the jojoba, oil is extracted from their seeds. The initiative also has the added advantage of serving as a carbon sink.

Through selection and modification, the plants' tolerance of desert conditions is also being increased, creating opportunities for their wider cultivation.

Treated wastewater from Zaldívar is used to irrigate the plantation. The mine's innovative treatment system, which uses biofilters, also produces humus for use as fertilizer.

A group of people wearing hard hats and safety vests are gathered at a construction site. The scene is overlaid with a teal tint. In the foreground, a woman with blonde hair, wearing a white hard hat and a high-visibility orange and black safety vest, is smiling and looking towards the right. Next to her, a man in a white hard hat and a high-visibility orange and black safety vest is looking at her. In the background, another man in a white hard hat and a high-visibility orange and black safety vest is smiling. On the right side, a man in a white hard hat with an 'MSA' logo and a grey jacket is shaking hands with the woman in the foreground. The background shows a construction site with a red truck and a large pile of earth.

# Pillar 5: Integrating Stakeholders



## OBJECTIVE

To include the vision of stakeholders in order to identify social trends, develop projects that generate positive externalities and co-benefits in the supply chain, manage reputational risks and contribute to the design of public policies to address challenges and take advantage of opportunities in an integral manner.

This pillar of our Climate Change Strategy has three main areas of focus:

- ▶ **Water management and adaptation from a territorial standpoint:** Engage the different stakeholders in the design and implementation of water management initiatives and adaptation solutions that co-benefit the territory in line with climate scenario actions and analysis.
- ▶ **Co-construction of supply chain measures:** Develop programmes for the supply chain that promote the adoption of practices and technologies that help to reduce and mitigate GHG emissions, in line with the particular realities of local and multinational suppliers.
- ▶ **Education training and activation of stakeholders:** Train employees and other stakeholders about matters related to climate change, increasing awareness and providing continuous incentives so that the Group's strategy permeates all levels, facilitating its management and monitoring.



# Communities

We actively support neighbouring communities in building resilience to climate change and mitigating its effects. This can take the form of specific projects such as the installation of solar panels in the Michilla fishing village or of support in improving processes and capabilities as, for example, in the case of water management in the basin of the Choapa River.

- ▶ **Choapa Valley.** In the drought-hit Choapa Valley, our single most important contribution to water sustainability is the construction of a desalination plant to produce industrial water for Los Pelambres. This will not only ensure the operation's own supply security but, once the second stage of the plant is completed in 2025, will free some 500 l/s of water, the possible uses of which will be addressed through processes of dialogue between Los Pelambres, the authorities and the communities. As from that date, although no longer drawing water from the river or wells for operational purposes, we will continue to play an active role in management of the basin, where we believe we can make a valuable contribution.

Under our Drought Plan for alleviating the Choapa Valley's water shortage, we have been building wells for agricultural water users and financing their operation. In addition, through the *Confluye* (Flow Together) programme, implemented by Fundación Minera Los Pelambres, we work with the area's Water Users' Boards to improve agricultural irrigation.

Among other activities, *Confluye* provides assistance in repairing irrigation canals in order to reduce water losses. In an interesting synergy between the water initiatives in which we are involved, the Quitai Anko research consortium ([page 47](#)) has begun to provide *Confluye* with information about where losses are greatest, thereby increasing the programme's efficiency.

Similarly, through the APXoxima programme, also implemented by Fundación Minera Los Pelambres, we support the local volunteer committees responsible for managing the Rural Water Services (SSR), previously known as Rural Drinking Water (APR) systems. We provide training and assistance for the design, construction and maintenance of infrastructure and, in 2022, will be helping to increase their water use efficiency by installing telemetry systems, powered with solar energy.



- ▶ **Los Vilos.** Los Pelambres ships concentrate from its Punta Chungo port facilities, close to the town of Los Vilos, with which it maintains close relations. In one of many projects in the town, it is seeking to repopulate the nearby coast with the *erizo rojo* (Chilean sea urchin), loco (Chilean abalone), mussels and other shellfish. Their farming is serving local fishermen as an alternative activity in the face of the increasing frequency of sea conditions that impede their more traditional extractive activities.

In a further initiative that seeks to foster economic activities that can strengthen communities' resilience to climate change, Los Pelambres has also joined a programme to restock the town's Conchalí Bay with congrio colorado (red kingclip), a fish. Backed by CORFO, Chile's economic development agency and technological support from Colorado Chile, an aquaculture developer, the programme not only raises smolts for release into the sea but also produces harvest-ready fish in land-based grow-out centres.

In the Los Vilos area and the Choapa Valley in general, Los Pelambres is also providing assistance in fighting wildfires. As well as helicopter support, this includes making available accommodation for employees of CONAF, Chile's national forest service.

- ▶ **María Elena.** Under our *Diálogos para el Desarrollo* (Dialogues for Development) social investment programme, we worked with the municipal government of María Elena, a town located 75 km from Antucoya, to draw up a plan for response to emergencies that include flooding due to intense rain and, given the water scarcity prevailing in the Atacama Desert, a lack of water for fighting the fires

that are unfortunately frequent, due to electrical faults in the town's old houses. We are also working with the town's fire service and a local radio on fire prevention public education initiatives.

- ▶ **Sierra Gorda.** In early 2021, we completed studies for a circular economy project to recycle waste from Centinela and create business opportunities for the nearby town of Sierra Gorda. It would transform wood pallets from Centinela into garden mulch, pellets and wood panels, with a view to creating a business model for implementation by suppliers in Sierra Gorda.
- ▶ **Calama Poniente.** The presence of wells from which Centinela currently draws water (page 43) means that we also work closely with the area's inhabitants to safeguard supply for human consumption by financing the design of a Rural Water Service (SSR), thanks to which it was possible to obtain state funding for the project's construction in 2022.
- ▶ **Michilla.** At facilities close to this fishing village, Centinela and Antucoya extract seawater for use at the mine sites and Centinela has a pier from which it ships concentrate. We are currently working with the community, the municipal government and other government agencies to repair the village's reverse osmosis drinking water plant so that its 300 inhabitants can again have running water, rather than depending on tanker deliveries.

Under the Dialogues for Development programme,

which we implemented in Michilla for the first time in 2021, the community indicated an interest in solar panels as a means of mitigating interruptions in household electricity supply. The project is currently at the pilot stage, starting with 20 families, and the aim is to switch the whole village to solar power within the next few years.





## Suppliers

In 2021, we reviewed our procurement policies to address ESG challenges and included formal ESG criteria in our decision-making model.

In alternate years, we conduct a survey of suppliers to learn about their practices and perceptions and, in 2021, included questions specifically about climate change. They covered matters such as suppliers' measurement of their emissions, their implementation of energy and/or water efficiency initiatives, circular economy processes, supply chain environmental risk and impact identification and the assistance they offer their own suppliers on environmental matters.

The information will be used to construct a baseline that will, in turn, serve as a foundation for working together with our suppliers within the framework of our Climate Change Strategy. This also includes awareness-raising and training activities, with specific actions for our local suppliers.

Today, we are already working collaboratively with key suppliers and external stakeholders to reduce emissions and the carbon footprint of our mine haulage trucks.

## Employees

We seek to ensure that our value proposition for employees supports our long-term sustainability, a task in which the Board's Remuneration and Talent Management Committee plays a key role ([page 11](#)). As a result, parameters related to climate change have gradually acquired greater prominence in the two performance agreement plans through which we seek to foster alignment with our purpose and retain talent.

For example, climate-related KPIs for the Short Term Incentive at the Group level had a weight of 5% in 2021. As well as at least compliance with the Group's Scope 1 and 2 emissions budget for the year, it also required that both Centinela and Zaldívar register with the Copper Mark responsible practices assurance framework by the end of the year (which they achieved in July and August, respectively).

Similarly, our Long-Term Incentive Programme, which is tied to performance over a three-year horizon, has progressively introduced more demanding climate-related targets. The first target to be incorporated, in

2019, was certification of the reduction in Zaldívar's CO<sub>2</sub> emissions (related to its switch to renewably-generated electricity) but, by 2021, it included the Group's new emissions reduction target ([page 33](#)) and compliance with the roadmap for implementation of our Climate Change Strategy.

To further embed our employees' commitment to combatting climate change, a series of six workshops on related subjects were held in May-June 2021. Surveys before and after the workshops found that they produced an increase in the perceived importance of climate change and its relevance for the Group's development of its business.

Following these workshops, we are holding a series of Dialogues about the Future. The first conversation, which took place in July 2021, was attended by almost 500 people and was led by CEO Iván Arriagada. It focused on our progress to date in implementing the Climate Change Strategy, its pillars and key initiatives. This has been accompanied by other presentations and numerous publications in internal media.



## Boosting water efficiency in Choapa Valley

In our social investment programmes, we tend to form alliances for their implementation, often with local foundations. In the case of the Group Technology Transfer Programme we are implementing in the Choapa Valley, Los Pelambres is collaborating with the Ministry of Agriculture and the government's Institute for Agricultural Research (INIA) to foster efficiency gains in agricultural irrigation.

Working with the Upper Valley Water Subcommittee, the programme is implementing a series of workshops for farmers growing walnuts and grapes, the two main crops in the upper reaches of the Choapa Valley. The techniques addressed in the workshops included the use of mulch or different types of synthetic covering

to retain moisture in the ground. The use of hydrogel, a polymer that absorbs and retains water, and the installation of underground irrigation, which reduces water consumption by close to a third, were also discussed as well as options that do not imply an investment outlay.

The programme has a duration of three years during which INIA will monitor the progress of the initiatives implemented. Participants can apply for funding from the Integral Support for Agriculture (AIA) programme of Fundación Minera Los Pelambres.

# Next Steps



# Next Steps

We recognise that strengthening our adaptation to the effects of climate change and their mitigation for our business, the communities in our areas of influence and society in general, is an ongoing concern that we see as a journey of maturity. As our maturity in this area develops, so will our ability to prepare for the future impacts of climate change.

In 2022, we will be seeking to build on our analysis of climate impacts and further embed climate considerations into our business. This will help us to direct capital to enhancing climate resilience as well as improve our performance against specific climate-related metrics and targets.

## Key actions will include:

- ▶ Disclose our performance against TCFD recommendations in our 2021 Annual Report;
- ▶ Deliver a programme to engage with employees and their communities and better understand how to manage social impacts related to both climate change and transition plans;
- ▶ Deploy our sustainable procurement strategy;
- ▶ Continue the implementation of an internal carbon price in a bid to optimise procurement and capital allocation in line with our decarbonisation targets;
- ▶ Establish an inventory of Scope 3 emissions, disclose it, and define a target for reduction;
- ▶ Validate our standards as a responsible copper producer through continued coverage of our operations by the Copper Mark Assurance Framework, including criteria related to energy consumption and GHG emissions management;
- ▶ Renew analysis for decarbonisation and the Long-Term Energy and Carbon Reduction Plan to ensure measures are accurately reflected, supporting the business case for the mitigation needed to achieve our carbon reduction goals;
- ▶ Expand the scope of climate scenario analysis, in terms of the number of scenarios used to assess potential impacts as well as the value drivers which are included in the assessment;
- ▶ Continue to incorporate analysis associated with the management of physical and transition risks and opportunities into our planning cycles, as well as decisions and actions for capital allocation;
- ▶ Review actions related to adaptation of critical infrastructure;
- ▶ Review the purpose, scope and authority of Committees in relation to climate change management to ensure effective assessment and management of climate risks;
- ▶ Reassess the Environmental Management Model implemented by each of our mining operations and the Transport division to ensure that climate-related issues are sufficiently managed at the operational level.

# Glossary

<b>Adaptation</b>	<ul style="list-style-type: none"><li>▶ In human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate and its effects.</li></ul>	<b>ML</b>	<ul style="list-style-type: none"><li>▶ Megaliters</li></ul>
<b>Carbon neutrality</b>	<ul style="list-style-type: none"><li>▶ Carbon neutrality or net zero carbon dioxide (CO<sub>2</sub>) emissions are achieved when anthropogenic CO<sub>2</sub> emissions are balanced globally by anthropogenic CO<sub>2</sub> removals over a specified period.</li></ul>	<b>MWh</b>	<ul style="list-style-type: none"><li>▶ Megawatt hour.</li></ul>
<b>Carbon price</b>	<ul style="list-style-type: none"><li>▶ The price for avoided or released carbon dioxide (CO<sub>2</sub>) or CO<sub>2</sub>-equivalent emissions.</li></ul>	<b>NbS</b>	<ul style="list-style-type: none"><li>▶ Nature-based solutions. Actions to protect, sustainably manage and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits.</li></ul>
<b>Climate model</b>	<ul style="list-style-type: none"><li>▶ A numerical representation of the climate system based on the physical, chemical and biological properties of its components, their interactions and feedback processes, and accounting for some of its known properties.</li></ul>	<b>RCPs</b>	<ul style="list-style-type: none"><li>▶ Representative Concentration Pathways. Scenarios that include time series of emissions and concentrations of the full suite of greenhouse gases and aerosols and chemically active gases, as well as land use/land cover.</li></ul>
<b>Energy intensity</b>	<ul style="list-style-type: none"><li>▶ Quantity of energy required per unit of output or activity.</li></ul>	<b>Recycled/reused water</b>	<ul style="list-style-type: none"><li>▶ Water that has been used in an operational task and is recovered and used again in an operational task, either without (reuse) or with (recycle) treatment.</li></ul>
<b>FTSE100</b>	<ul style="list-style-type: none"><li>▶ The Financial Times Stock Exchange 100 Index.</li></ul>	<b>Resilience</b>	<ul style="list-style-type: none"><li>▶ The capacity of social, economic and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure while also maintaining the capacity for adaptation, learning and transformation.</li></ul>
<b>GHG</b>	<ul style="list-style-type: none"><li>▶ Anthropogenic gases such as carbon dioxide, methane and nitrous oxide that contribute to the warming of the planet.</li></ul>	<b>SMEs</b>	<ul style="list-style-type: none"><li>▶ Small and medium-sized enterprises.</li></ul>
<b>IEA</b>	<ul style="list-style-type: none"><li>▶ International Energy Agency.</li></ul>	<b>tCO<sub>2</sub>e</b>	<ul style="list-style-type: none"><li>▶ Tonnes of carbon dioxide equivalent.</li></ul>
<b>Mitigation</b>	<ul style="list-style-type: none"><li>▶ A human intervention to reduce emissions or enhance the sinks of greenhouse gases.</li></ul>		

For further information on climate-related terms, see [IPCC 2018 Glossary](#).

For further information on nature-based solutions, see the International Union for Conservation of Nature [website](#).



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