



ANTOFAGASTA PLC

# TCFD Progress Report



## TCFD Progress Report

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## Leadership Statement

We recognise climate change as one of the greatest challenges facing society and our business. As a critical mineral in low carbon technologies, copper is playing a part in building a better future. Additionally, changes to the climate will impact not only our business, but society as a whole. At Antofagasta, we acknowledge our role and responsibility as part of the solution and that is why we are working to put climate change at the heart of our business and build in climate resilience. The recent release of Part 1 of the IPCC's Sixth Assessment Report emphasizes the need to accelerate global action to limit global warming to 1.5°C and avoid climate change's most devastating impacts. We will continue to invest in our climate mitigation and adaptation plans to decarbonise and build resilience against potential future physical climate impacts. Our response to tackling climate change is directly aligned with our core business strategy of reducing our risk exposure, fulfilling our commitment as a responsible mining company and, developing mining for a better future.

**Iván Arriagada**  
Chief Executive Officer



# The TCFD Recommendations



## Governance

The organisation's governance around climate-related risks and opportunities



## Strategy

The actual and potential impacts of climate-related risks and opportunities on the organisation's businesses, strategy and financial planning



## Risk Management

The processes used by the organisation to identify, assess and manage climate-related risks



## Metrics and Targets

The metrics and targets used to access and manage relevant climate-related risks and opportunities



# Climate Resilience

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**We are strengthening our climate resilience, adapting to today's climate change impacts, whilst also mitigating against emerging climate risks and seizing opportunities to decarbonise our business. The TCFD recommendations provide a welcome framework for us to share with our stakeholders our journey to combat climate change and manage its impacts.**

# Climate Resilience

Climate change is a reality and we expect copper demand to increase as it plays an essential role as a critical mineral in low-carbon technologies. As one of the world's largest copper producers, Antofagasta plays an important part of the solution. Our aim is to help fulfill demand for copper whilst lowering the carbon intensity of our business. We must also be resilient to the potential changes of our future climate without certainty of their full impact. This has been evidenced by the prolonged drought we have experienced in the Choapa Valley where Los Pelambres is located. As a result we have implemented strict water management protocols and various other actions to mitigate the impact and build resilience from water shortages. We actively seek opportunities that arise in the transition to a lower carbon future and we are motivated to enhance our resilience to potential changes in our climate. These objectives are directly aligned with our business strategy in terms of reducing exposure to risks, ensuring business continuity and consolidating our position as a responsible and sustainable producer of copper in the long term.

The recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) provide a welcome framework through which to disclose our ongoing work around climate change, enabling us to share our identification and assessment of the most material climate-related risks and opportunities for our business and to explain how we plan to manage these now and in the future. We recognise that adopting its recommendations is a journey and involves a conversation with our stakeholders. It is not a box-ticking exercise, but something that will evolve over time and be part of an ongoing dialogue with our stakeholders

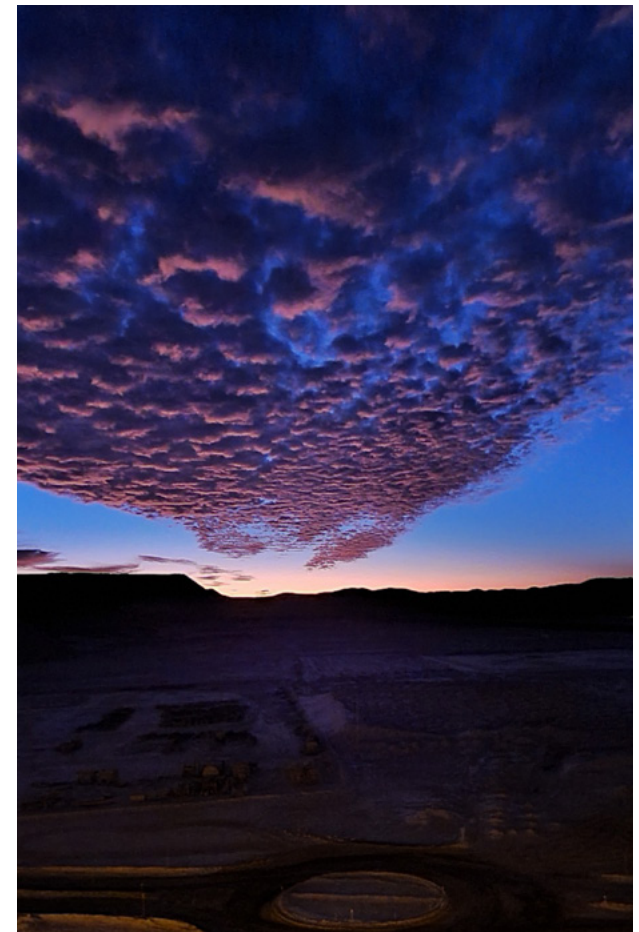
to ensure they have the right information about our business and the impacts of climate change.

In our first disclosure against the TCFD recommendations in our Annual Report 2020, we built on our existing carbon management programme and have a clear understanding of where we must focus next, across both our Mining and Transport divisions. In recent years, we have developed robust systems to measure and manage carbon emissions, giving them and our contributions to climate change greater visibility. We have also undertaken a detailed assessment of our adaptation and mitigation measures, many of which are now incorporated into our near-term financial plans. This includes energy efficiency measures and the replacement of diesel with LNG in our boiler system in order to achieve our target of reducing emissions by 30% by 2025 compared to 2020. We have also worked to incorporate carbon-reduction strategies in all our power supply contracts and are progressing towards obtaining 100% of our electricity consumption from renewable sources by 2022. As part of our strategy to reduce our dependence on continental water we have introduced water efficiency measures and also invested in desalination infrastructure.

In 2020, we carried out a climate scenario analysis, focused on forward-looking climate change scenarios and how these can be used to define where and how climate-related risks and opportunities could impact our business. In parallel to our climate scenario analysis, we have undertaken a review of our governance, performance management and risk management systems to evaluate how our current processes align with TCFD recommendations. This analysis has allowed

us to identify areas that need to be strengthened within the next 12 months and to further embed climate considerations into our core business.

In this TCFD Progress Report, we provide an overview of our TCFD-related work to date, our climate resilience response and our plans to achieve full disclosure against TCFD recommendations in the near future.





# Progress against TCFD Recommendations



## GOVERNANCE

The Board of Directors has ultimate responsibility and oversight, exercised through the Sustainability and Stakeholder Management Committee and the Audit and Risk Committee.

Climate-related responsibilities are assigned to specific management-level positions. The CEO is responsible for approving goals and monitoring the status of emissions-reduction initiatives. Responsibility for the management of specific climate-related risks and opportunities is distributed within the organisation, with some roles defined.

In 2020, we convened an internal, cross-departmental Climate Change Committee that is responsible for monitoring the development and implementation of the Climate Change Strategy.



## STRATEGY

In 2020, we developed our approach and strategy for climate change.

To evaluate the resilience of our business strategy against potential climate risks, we are developing our climate scenario analysis approach. We have selected the International Energy Agency's (IEA) Sustainable Development Scenario (SDS), an aggressive mitigation scenario, to identify climate-related risks associated with the transition to a low-carbon economy. This global narrative is supplemented by mining and Chile-specific adaptation and mitigation measures to contextualise risks for our operations and assets. We are also using a high-warming scenario that is aligned with the Intergovernmental Panel on Climate Change's (IPCC) RCP8.5 scenario in order to understand our risk exposure to potential physical climate impacts that could occur in the absence of climate mitigation targets. These scenarios allow us to capture and consider the broadest range of potential risks and opportunities.



## RISK MANAGEMENT

Climate change risks and opportunities are identified, assessed and managed within our Integrated Risk Management System.

Risk appetite for climate change has been defined as "medium", indicating that the level of risk should be managed in accordance with Antofagasta's risk management framework, which considers, among other factors, costs and benefits associated with climate change.

In assessing climate-related risks and opportunities, we broadly divide them into two categories: those related to the impact of the transition to a low-carbon economy and those related to the physical impacts of climate change.

Existing and short-term physical risks were identified, evaluated and incorporated into the Risk Register for the first time in 2019. However risks related to water scarcity have long been included as a key issue in our Risk Register. Any additional longer-term risks identified through scenario analysis will be incorporated for further assessment.



## METRICS AND TARGETS

Since 2017, we have been implementing a series of projects to reduce our annual GHG emissions by 300,000 tonnes between 2018 and 2022. Following the early achievement of this target in 2020, we have committed to reducing our Scope 1 and 2 GHG emissions by 30% by 2025, relative to 2020. In addition, by 2022, we aim to use 100% renewable electricity at all our mining operations.

In the long term, we have committed to achieving carbon neutrality by 2050. This is aligned with our ambition to replace our consumption of diesel with low-carbon alternatives. Over the next year, we will develop a decarbonisation roadmap that will include details of planned projects as well as a description of possible low-carbon solutions which are not yet commercially available but offer opportunities in the long term.

We continue to monitor and adapt our use of water, which impacts both our operations and local communities. We aim to enhance water security with the desalination plant at Los Pelambres which we expect to come on line in the second half of 2022, thereby reducing our exposure to climate-associated risks.



## Governance

The Board of Directors has ultimate responsibility and oversight for climate-related issues, exercised through several different Committees and management mechanisms. At Board meetings, which take place on average every six weeks, the Vice President of Strategy and Innovation presents the main issues associated with climate change and the adaptations the Group is implementing, such as energy efficiency measures. The Vice President of Finance and Administration (CFO) is leading the Group's response to TCFD recommendations and is ultimately in charge of directing the climate scenarios, risk analysis review process and business planning cycles. The Vice President of Corporate Affairs and Sustainability is in charge of the Group's Climate Change Strategy and managing the interaction between the company and various stakeholders such as investors.

The Board's Sustainability and Stakeholder Management Committee provides guidance to the Board on sustainability matters. This includes reviewing and updating the Group's strategy and policy framework, including climate change as well as other environmental,

health and safety, human rights, communities and other stakeholder issues. The Audit and Risk Committee reviews risks, including climate change, and reports any significant matters to the Board at least three times a year. Climate change and, ultimately, the Group's response to the TCFD recommendations are supervised by these two Board committees on a regular basis, with presentation of matters to the Board on an ad hoc basis.

► [For further information, see our Annual Report 2020, page 118.](#)

Climate-related responsibilities are assigned to specific management-level positions. The CEO is responsible for approving goals and monitoring the status of emissions-reduction initiatives. The Vice President of Corporate Affairs and Sustainability, the Vice President of Finance and Administration (CFO) and the Vice President of Strategy and Innovation are responsible for proposing goals, monitoring and reporting on GHG-reduction initiatives and adaptation and mitigation issues. Responsibility for the management of specific climate-related risks and opportunities is distributed within the organisation, with some roles defined. For example, the Energy Management team is responsible for managing energy supply contracts, energy efficiency initiatives and emissions-reduction targets. In addition, we have convened an internal, multi-disciplinary Climate Change Committee that is responsible for monitoring the development and implementation of the Climate Change Strategy.

Environmental performance, including climate change, is reported monthly to the Executive Committee and half-yearly to the Sustainability and Stakeholder Management

Committee. The Group holds employees and managers accountable through a Performance Agreement, which is set each year and reviewed twice during the year and serves to align employees with certain strategic pillars such as safety and, more recently, climate change. In 2020, the Group incorporated progress towards and achievement of the 2018-2022 emissions-reduction target as a performance measure for managers, particularly at the operations.

We are in the process of formalising communications channels and mechanisms on climate change from operational management to the Executive Committee and Board. This will include outlining specific responsibilities and our approach to reporting against climate-resilience objectives.

We will be reviewing the purpose, scope and authority of the Committees in relation to climate change management to ensure effective assessment and management of climate risks. This will include a review of the Projects Committee to ensure that sufficient processes are in place for it to consider climate-related issues when making recommendations on new projects and investments.

The Environmental Management Model implemented by each of our mining operations and the Transport division will be reassessed to put in place measures to ensure that climate-related issues are sufficiently managed at the operational level.





## Strategy

In 2020, we undertook a climate scenario analysis to evaluate the resilience of our strategy to climate change over time. Firstly, we reviewed a range of globally recognised and publicly available scenarios for two different hypothetical climate futures: one aligned with a global, coordinated transition to a low-carbon economy and, in the other case, a high-warming scenario. These scenarios consider changes in physical, regulatory, market and stakeholder operating conditions over the lifetime of our assets and long-term financial planning forecasts. They cover a range of relevant time periods in order to identify key risks and opportunities in the short, medium and long term.

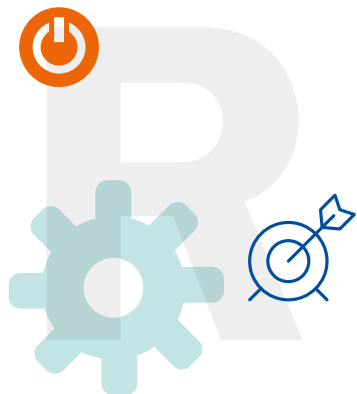
We have considered two scenarios to reflect two extremes of climate change:

- An 'aggressive mitigation' scenario under which significant policy and regulatory action and rapid technological change imply that the rise in temperature remains well below 2 °C. To assess the risks related to this scenario, we have used the SDS of the IEA as the basis of assumptions. The SDS describes a pathway for achieving the temperature goal of keeping its rise to between 1.5 °C and 1.65 °C through a major transformation of the global energy system. The SDS is one of the most ambitious and commonly used scenarios and, therefore, permits comparison with other companies in our industry.

- A 'high-warming' scenario under which there is limited action to address rising emissions and average temperatures rise by around 4 °C by 2100, generating significant disruption of climate and weather systems. To assess the impact of physical risks in this scenario, we are using the IPCC's RCP8.5 scenario. The RCP8.5 scenario represents the most extreme view on plausible climate change and enables us to explore the upper range of potential physical impacts to which our assets and activities may be exposed.

Following the selection of scenarios to assess both transition and physical climate-related issues, we assessed the potential risks and opportunities and associated business impacts. We convened several working groups to understand the relevance and impact of these risks and engage our experts on how these risks could materialise in our operations. These working groups initiated conversations on how we can quantify the associated financial impacts, as well as existing and planned mitigation and adaptation measures. In 2021, we will be seeking to quantify the potential financial impacts of our most material climate-related risks and opportunities, and this will inform our response in terms of strengthening business resilience.

As copper is an important factor in a decarbonised future, we aim to further our understanding of its projected use and the associated price drivers. Through this research, we will assess how this increase in demand will affect our business and supply chains.



## Risk Management

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. The Board defines and regularly reviews the acceptable level of exposure to key risks, taking into consideration the balance between threats and opportunities. Risk appetite for climate change has been defined as “medium”, indicating that the level of risk should be managed in accordance with Antofagasta's risk management framework, which considers costs and benefits associated with climate change, among other factors. This assessment will be reviewed at least annually. Climate change is reported as one of the 19 Principal Risks, along with its corresponding risk classification based on the estimated level of impact and probability. Furthermore, associated environmental risks such as water scarcity have long been identified as a key issue due to the challenging environments in which we operate. For each of our mining operations and the Transport division, existing and short-term physical risks were identified, evaluated and incorporated into the Risk Register for the first time in 2019. Any additional longer-

term risks identified through scenario analysis, will be incorporated for assessment in 2021.

► [For further information, see our Annual Report 2020, page 22.](#)

Our Risk Management Manual defines the corporate process for identifying and evaluating risks and ranking them (according to their level of impact and probability of occurrence). This includes methodologies for assessing the financial materiality of uncontrolled risks in terms of their impact on production, EBITDA and other qualitative aspects. The status of these risks, monitoring process, actions plans and any emerging issues are reported twice a year to the Board's Audit and Risk Committee.

[For further information, see our Annual Report 2020, page 25.](#)

In assessing climate-related risks, we broadly divide them into two categories: those related to the impact of the transition to a low-carbon economy and those related to the physical impacts of climate change. We recognise that transition risks are more prevalent in the short to medium term, due to the need for an ambitious, coordinated climate policy at the national and global levels, while the severity of physical climate impacts is likely to continue to intensify over time, with additional climate hazards emerging. Planning cycles using climate scenario analysis are valuable as we look to identify and manage the short,

medium and long-term risks that may have been missed in our current timeframe for mine planning, asset design and risk assessment.

We recognise that climate change risks will occur over longer and more uncertain timeframes than most other business risks. Therefore, the adaptation of processes and additional guidance will be developed to ensure that climate-related risks are assessed and prioritised in a systematic and comprehensive manner. In the long term, new risks may emerge and the risks that have been identified will evolve, but our aim is to build a lasting framework that enables the business to adapt to, capture and manage these potential risks.

Moving forward, we will be seeking to analyse the financial impact of climate risks. This analysis will help us to further tailor our current risk management processes to permit the effective management of the intricacies of climate risks. It is important that the Monitoring and Review phase incorporate climate change risks, including guidance on “what to measure/review/confirm” and “how to measure/review/confirm”. It is also important to stress that this analysis is based on inputs that may themselves not be accurate. Consequently, it can be used as a guide to the Group's potential future, but does not reflect our long-term forecasts or views on the future.



## Metrics and Targets

Reporting our GHG emissions, environmental footprint, performance and progress helps us understand our contribution to climate change, keeps us accountable for our environmental commitments and maintains our transparency. It has always been important to us to ensure that we contribute to the transition to a low-carbon future through the production of copper, an essential metal in low-carbon technologies, as well as by managing our own environmental impact. This subject has grown in importance in recent years for all our stakeholders as the Group seeks to incorporate climate change metrics into business and investment decisions and strategy planning.

In 2020, we started to review our Scope 3 footprint in addition to the Scope 1 and Scope 2 emissions we have previously been reporting. In 2021, we will complete this analysis to assess emissions across our entire value chain. In the coming years, as our approach to measurement becomes more sophisticated, we will be

able to report our full value-chain emissions with greater certainty and implement appropriate adaptation and mitigation measures.

Under our five-year target, set in 2018, we committed to an absolute reduction of 300,000 tCO<sub>2</sub>e of emissions by 2022 compared to a 2017 baseline. We are pleased to report that the Mining division has achieved this target two years early, reporting a total reduction of 581,353 tCO<sub>2</sub>e. Following the achievement of this target, we have committed to a more ambitious 30% reduction (730,000 tCO<sub>2</sub>e) of our Scope 1 and 2 emissions by 2025, relative to 2020. This target is aligned with climate science to limit temperature rise to 1.5°C. We will begin to report progress against this new target as from next year.

In July 2020, Zaldívar became the first of our operations to procure 100% renewable electricity. Today, some 20% of Antofagasta's electricity consumption comes from renewable energies sources. We aim to use 100% renewable electricity by 2022. We continue to implement energy efficiency projects, and this is reflected in the reduction of Scope 2 emissions across our operations.

We have committed to becoming carbon neutral by 2050, in line with Chile's national target. This target covers our Scope 1 and 2 operational emissions. This commitment is aligned with our long-term ambition to replace our consumption of diesel with low-carbon alternatives. Over the next year, we will develop a decarbonisation roadmap. It will examine potential carbon-reduction measures that could be rolled out over the next 30 years. It will include details of planned projects as well as a description of possible low-carbon solutions that are not yet commercially available but offer opportunities in the long term.

All our mining operations are in water-stressed areas. Care for water is, therefore, a key part of our approach



to mitigating and adapting to climate change. We are working to ensure sufficient water availability for our operations and local communities. In line with this, raw sea water accounts for a large proportion of water consumption at Antucoya and Centinela and we will further increase our use of sea water following the completion of a desalination plant at Los Pelambres by 2022. In addition, all our operations are working to increase their water reuse rates. We have embedded a water efficiency target (m<sup>3</sup>/tonne of copper) into employee performance incentives at Los Pelambres.

► [For details of our full environmental footprint and performance see our Annual Report 2020, page 53.](#)



## CO<sub>2</sub> emissions (tonnes of CO<sub>2</sub> equivalent)<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
<b>Los Pelambres</b>	257,801	251,580	262,355	464,492	544,900	523,942	722,293	796,480	786,297	2.01	2.19	2.20
<b>Centinela</b>	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
<b>Zaldivar</b>	152,340	140,623	141,475	162,688	192,862	180,109	315,028	333,485	321,584	3.27	2.87	3.40
<b>Antucoya</b>	152,577	152,231	168,490	120,087	114,337	123,353	272,664	266,568	291,843	3.44	3.71	4.04
<b>Corporate offices</b>	108	106	1	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>
<b>Transport division</b>	<b>88,936</b>	<b>96,854</b>	<b>99,400</b>	<b>858</b>	<b>1,118</b>	<b>1,224</b>	<b>89,794</b>	<b>97,972</b>	<b>100,642</b>	<b>13.93</b>	<b>15.20</b>	<b>16.59</b>
<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 Zaldivar, 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.

# Our TCFD Journey

Climate  
Scenario  
Analysis

Climate Risk  
and Opportunity  
Identification

Antofagasta's  
Adaptation  
and Mitigation  
Response

Next Steps  
towards  
Enhancing  
Resilience



# Climate Scenario Analysis

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**We use a range of climate scenarios to explore potential climate-related risks and opportunities. At one end of the spectrum, an aggressive mitigation scenario informs the more ‘extreme’ transition risks, whilst, at the other end, a high-warming scenario identifies the worst potential physical risks.**





# Climate Scenario Analysis

## Transition scenario

To aid the transition to a low-carbon future, significant policy interventions are needed. Transition scenarios provide a narrative for political and technological interventions, linked to a changing energy mix, that are compatible with a pathway limiting global temperature rise to less than 1.5°C.

In 2020, following a peer analysis and assessment of several scenario options, the Group selected the International Energy Agency's Sustainable Development Scenario (SDS) to provide a global view and context in a low-carbon transition. The SDS is one of the most ambitious and commonly used transition scenarios, thereby permitting comparison with other companies in our industry. This scenario limits temperature rise to between 1.5°C and 1.65°C by the end of the century. Although current global and national pledges fall short of this ambition, this view of mitigation allows us to consider the complete range of impacts from an aggressive low-carbon transition.

In a transition to a low-carbon economy, beneficial metals such as copper are essential to achieve global decarbonisation targets. The increase in renewable power generation and the electrification of transportation are key aspects for decarbonisation and both require significant input of copper. The metal's unique characteristics such as electrical conductivity and heat transfer capabilities make copper the choice metal for electric motors and wires. For example, in the most ambitious transition scenario by the IEA, the Sustainable Development Scenario sees a rapid increase in solar photovoltaic energy generation capacity.

This research<sup>1</sup> indicates that the adoption of solar photovoltaic energy could alone result in the tripling of copper demand already earmarked for use. Understanding the significant changes in demand for copper in the coming decades will help us to identify risks, impacts and opportunities for our operations and future projects.

### ► Chile's climate policies

While the SDS represents a global view of the mitigation required to aggressively curb GHG emissions, we must also consider how this compares with the ambitions and policies laid out by the Chilean government.

Most mitigation plans in Chile feed into or are defined as part of its Long-term Climate Strategy (Estrategia Climática de Largo Plazo, ECLP), which outlines the country's ambition for the next 30 years. This centres around the goal of achieving GHG neutrality by 2050 as well as setting national carbon budgets and sector-specific mitigation targets. Chile's overarching Climate Action Plan 2017-2022 had served as the main instrument articulating climate change policy across all sectors. However, in April 2020, the Chilean government announced an enhanced national climate commitment under the Paris Agreement, the Nationally Determined Contributions (NDCs) Report, which set out new ambitions. It outlined a carbon neutrality scenario in line with the 2050 carbon neutrality goal included in the Draft Framework Law on Climate Change, currently under consultation. The update also included a peak emission date of 2025 and a target of limiting total annual emissions to 95 MtCO<sub>2</sub>e by 2030. Alongside the NDCs, Chile's Long-term Climate Strategy provides guidelines for achieving the carbon-neutral ambition over the next 30 years.

While Chile now has a 2050 carbon neutrality target and an interim 2030 NDC, the specific policy mechanisms for achieving these objectives have not yet been fully defined. However, by reviewing Chile's current and potential climate policies, we can form a view on how these could impact our business in the future.

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1 IEA, The Role of Critical Minerals in Clean Energy Transitions

<https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions/mineral-requirements-for-clean-energy-transitions>



## Key climate policy developments and their potential impacts on our business

Policy	Potential impacts relevant to our business
<b>Revisions to the threshold of Chile's carbon price, that could in future be applied to our operational emissions</b>	<ul style="list-style-type: none"> <li>▶ Direct increase in operating costs.</li> </ul>
<b>The Cooperation Agreement and Energy Efficiency Law</b>	<ul style="list-style-type: none"> <li>▶ Mandated energy efficiency implementation, consumption reductions and reporting.</li> </ul>
<b>Phase-out of coal and increase in renewables</b>	<ul style="list-style-type: none"> <li>▶ Increased demand for copper in low-carbon technologies.</li> <li>▶ Reduction in green energy prices.</li> <li>▶ Support for the business case for decarbonisation measures.</li> <li>▶ Decarbonisation of the electricity grid.</li> </ul>
<b>National Green Hydrogen Strategy to develop a roadmap for competitive green hydrogen</b>	<ul style="list-style-type: none"> <li>▶ Domestic, economic source of low carbon fuel that has the potential to displace diesel.</li> <li>▶ Industrial policy that may support the development and piloting of necessary technologies for the displacement of diesel.</li> </ul>
<b>Electromobility Strategy in Chile and globally</b>	<ul style="list-style-type: none"> <li>▶ Increased international demand for domestically-produced commodities, including copper.</li> </ul>
<b>Long-term Climate Strategy and sector-specific mitigation and adaptation plans</b>	<ul style="list-style-type: none"> <li>▶ Sector-specific carbon budgets and mandated mitigation measures expected in 2022, including for the mining sector.</li> </ul>



## Review of climate policy developments



By undertaking an in-depth review of climate policy developments, we can begin to assess current and future transition risks.

- **Revision of the threshold of Chile's carbon price:**

Chile's carbon price of US\$5/tCO<sub>2</sub> is applied to operators of boilers and turbines with a thermal capacity of 50 MW or more. Over the past year, the government has increased its ambitions and is holding consultations on a review of green taxes. Chile's carbon tax compliance thresholds are set to change and apply to installations that emit more than 25,000 tCO<sub>2</sub>. Details on further expansions of compliance thresholds to cover our operational emissions and changes in the price of carbon have yet to be determined by the government.

- **The Cooperation Agreement and Energy Efficiency**

**Law:** The mining sector and the Energy Ministry have a Cooperation Agreement on progress in energy efficiency. Under this, the mining sector is accountable for the ongoing implementation of energy efficiency measures for each task in the value chain. In January 2021, Chile also passed an Energy Efficiency Law, aiming to reduce consumption by 10% by 2030, which mandates large energy consumers, such as the mining industry, to actively manage and report energy consumption and other indicators. In line with this, energy efficiency is one of the Group's internal performance metrics. This also mandates implementation of an Energy Management System under ISO 50001 for our Transport division.

- **Phase-out of coal and increase in renewables:** The Chilean government has undertaken to phase out coal by 2040 and increase the share of electricity generated from renewable sources. In both cases, progress is moving at a much faster rate than expected. The increased adoption of renewable energy in the electricity

mix and the resulting reduction in green energy prices support the business case for other social measures such as electric buses for the transportation of people and other similar decarbonisation measures. These measures continue to be supportive of long-term demand for copper.

- **National Green Hydrogen Strategy:** Due to the abundance of renewable energy sources in the Atacama Desert of northern Chile and the Magallanes Region in the south, the country has the opportunity to produce competitive green hydrogen on a large scale for both domestic use and export. Government investment to accelerate the development of this technology - for example, the recently announced funding round of US\$50 million for green hydrogen projects - supports our ambition to replace diesel at our operations with newer, cleaner and greener fuel sources without jeopardising operational reliability.
- **National Electromobility Strategy:** The government's strategy aims to achieve a shift in transportation electrification. This contributes to and supports global projections of increased international demand for domestically-produced commodities, including copper. The first green shoots of this strategy can be seen in the recent introduction of 2,000 new electric buses and the incorporation of charging stations in the Santiago transit network.
- **Long-term Climate Strategy:** The government has signalled the development of sector-specific mitigation (carbon budgets) and adaptation plans. These have not yet been fully defined but early indications are that a mining-sector adaptation plan will be announced during 2022.





## Physical scenario

The risk of disruptions related to changes in weather has long been monitored by our operations using historical weather information and short-term forecasts. This is supplemented by real-time weather monitoring stations across our areas of influence. This data provides a strong base from which to shift analysis to a more forward-looking assessment of the physical impacts of climate change.

In 2020, we began to further develop our understanding of medium and long-term physical risks related to climate change by analysing climate change scenarios. This scenario analysis uses projections of climate and risk variables to explore how our physical operating environment will change over the lifetime of our assets. To explore the upper range of physical changes to which we may eventually be exposed, we selected the high-warming

RCP8.5 scenario.<sup>1</sup> This scenario is commonly used across our industry to assess physical risks so relevant information is readily available. This choice is aligned with the MiCA (Mining Climate Assessment) tool developed by the ICMM, a mining industry platform that provides climate projections under this scenario. It is also the principal scenario analysed by the Chilean government to inform the development of adaptation policies.

The RCP8.5 scenario reflects a baseline scenario that does not include a climate mitigation target. By selecting an upper-range physical change scenario, we are able to consider the magnitude of ‘worst case’ physical impacts, address the inherent uncertainty that can be expected in the long term and ultimately capture the full

range of potential risks to our business. In addition, the results will inform the development of our mitigation and adaptation planning to limit potential adverse effects and implement appropriate measures. Planning will not be directly influenced by the long list of risks and impacts but informed by their potential materiality.

To understand how the climate will change under this scenario, we reviewed several sources of data, including projections from the CMIP-5 (Coupled Model Intercomparison Project Phase 5) set of Global Climate Models (GCMs). We focused on variables for climate and physical hazards that are relevant to our operations, assets and the regions where we operate.

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<sup>1</sup> Fifth Assessment Report, IPCC  
<https://www.ipcc.ch/assessment-report/ar5/>



## Key climate factors and potential climate changes that could affect our operations

Climate factor	Potential climate changes relevant to our operations
<b>Rising air temperatures</b>	<ul style="list-style-type: none"> <li>▶ Shift in average temperatures of around 1.5°C by 2050, rising to as high as 4°C by the end of the century, in the Coquimbo and Antofagasta Regions.</li> <li>▶ More frequent and longer heat-wave events.</li> </ul>
<b>Low or falling annual rainfall</b>	<ul style="list-style-type: none"> <li>▶ More frequent droughts, such as that seen in the Coquimbo Region where our Los Pelambres mine is located, as average annual precipitation drops.</li> <li>▶ Arid conditions expected to continue as cumulative annual precipitation remains low in the Atacama Desert where our Antucoya, Centinela and Zaldívar mines operate.</li> </ul>
<b>Intense rainfall events</b>	<ul style="list-style-type: none"> <li>▶ Potential increase in the frequency of short, intense rainfall events, particularly in northern Chile during the Andean Plateau winter.</li> <li>▶ Potential for flash flooding, which may carry alluvium, and other hazards.</li> </ul>
<b>Extreme wave and sea swells</b>	<ul style="list-style-type: none"> <li>▶ More frequent disruptive wave and swell events along some parts of the coastline.</li> <li>▶ Warmer sea temperatures favouring algal blooms.</li> </ul>





# Climate Risk and Opportunity Identification

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**We have identified and analysed climate-related risks and opportunities across climate change scenarios over the lifetime of our mining and transport operations. This information will help us understand where to allocate resources to ensure future resilience.**



## Transition risks and opportunities

### Transition Risks

### Potential Impacts

#### Risks

#### Policy and Legal

- ▶ Carbon tax on operational emissions: over the past year, the Chilean government has increased its ambitions and a revision of industry coverage is expected. International bodies are also calling for an increase in carbon taxes globally.
- ▶ Stricter legislation and mandates such as the Cooperation Agreement and Energy Efficiency Law.
- ▶ Exposure to litigation on grounds of insufficient response to climate change.

- ▶ High GHG emission costs.
- ▶ Increased costs related to compliance such as meeting GHG reporting requirements as well as responding to investor and stakeholder queries on climate change.
- ▶ Investment in energy efficiency mandates.
- ▶ Increased costs from fines.

#### Market and Technology

- ▶ Increased cost of fuel: annual analysis by Chile's Energy Ministry indicates an increase in the price of diesel over the next 30 years under both its high and average scenarios.
- ▶ Change in price of electricity due to changes in market and demand.
- ▶ Change in the mindset of consumers in favour of low-carbon products.
- ▶ Dependence on development of hydrogen technologies: needed to reduce reliance on diesel and reduce GHG emissions.
- ▶ Increased competition from recycled copper.

- ▶ Higher operating costs associated with increased cost of fossil fuels and pass-through of carbon tax.
- ▶ High upfront costs for low-carbon investments.
- ▶ Early retirement of existing technology to reduce the carbon intensity of our business.
- ▶ Increase in cost of research and development (R&D) and implementation; for example, we are assessing the replacement of diesel mining trucks by electric-assisted trolleys.
- ▶ Reduction in demand as consumers opt for recycled copper or producers with green credentials.

#### Reputational

- ▶ Pressure from stakeholders for responsible mining.
- ▶ Expectations of response to potential climate impacts that could affect local communities.

- ▶ Loss of licence to operate if not seen to respond in line with expectations.
- ▶ Compliance with Copper Mark expected by stakeholders. We are committed to responsible mining and are fully supportive of initiatives that demonstrate responsible production. In July 2021, Centinela became our first operation to achieve Copper Mark certification, followed by Zaldivar, which received this certification in August.
- ▶ Support required for local communities in the face of climate change.
- ▶ Loss of market share as copper producer.



## Transition Opportunities

## Potential Impacts

### Opportunities

#### Resource Efficiency

- ▶ Implementation of energy efficiency and carbon-reduction measures e.g. efficient comminution.

- ▶ Lower carbon intensity and reduced exposure to the potential future cost of carbon.
- ▶ Reduction in operating costs through efficiency gains.

#### Energy Source

- ▶ Replacement of diesel with low-carbon alternatives.
- ▶ Reduction in the price of renewable electricity expected as the proportion of renewables available in Chile increases.
- ▶ Development of new technologies to facilitate mitigation.

- ▶ Reduction in our exposure to GHG emissions and sensitivity to future fossil fuel price increases as a result of replacement of diesel and the implementation of new technologies for mitigation.
- ▶ Reduction in operating costs associated with the switch to 100% renewable power sources.
- ▶ Increased capital availability for further abatement measures and investments in low-carbon solutions achieved from savings through energy efficiency measures.

#### Products

- ▶ Increased demand for copper as a key material in low-carbon technologies e.g. renewable energy and the electrification of transportation systems.
- ▶ Opportunity for reforestation and other nature-based solutions projects.

- ▶ Potential increase in the copper price and the Group's revenues.
- ▶ Reduction in cost of complying with decarbonisation trajectories as a result of emission removal through carbon sinks and sequestration projects.

## Physical risks

Physical Risks		Potential Impacts
Chronic		
Rising air and ocean temperatures	<ul style="list-style-type: none"> <li>▶ Extreme temperatures and heat-wave events.</li> <li>▶ Particulate matter blown into the air, due to the dry conditions prevailing in both northern and central Chile.</li> <li>▶ Melting of glaciers and reduced snowpack with seasonal impact on freshwater supply.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Stress to infrastructure and equipment; additional maintenance required.</li> <li>▶ Health and safety conditions not met for workers.</li> <li>▶ Careful management of particulate matter required to remain within regulatory limits and minimise the concerns of nearby communities.</li> <li>▶ Disruption to sea water capture and port activities; stoppages for cleaning and maintenance required.</li> </ul>
Low or falling annual rainfall	<ul style="list-style-type: none"> <li>▶ Reduced security of water supply due to low precipitation and potential for prolonged drought conditions in central Chile.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Sites reliant on continental water cease operations. Our Centinela and Antucoya operations use primarily sea water, while Los Pelambres is transitioning its water supply from continental to sea water.</li> <li>▶ Investment in desalination plant and other measures to reduce dependence on continental water and enhance water security.</li> <li>▶ Increased need to support local communities and wider social expectations due to prolonged droughts, particularly in the Choapa Valley where the agricultural economy is dependent on rainfall.</li> </ul>
Acute		
Intense rainfall events	<ul style="list-style-type: none"> <li>▶ Flood and alluvium events, most likely to occur in the Northern Region during the Andean Plateau winter.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Damage to assets and suspension of operations.</li> <li>▶ Potential for substantial damage to neighbouring communities and regional infrastructure.</li> </ul>
Extreme wave and sea swells	<ul style="list-style-type: none"> <li>▶ Increased frequency and intensity of wave and storm swell events along the length of the Chilean coastline due to rising sea levels, shifting currents and changes in wind intensity.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Disruption to port activities and delays in the export of products and import of key supplies.</li> <li>▶ Increased maintenance of coastal infrastructure at ports and for sea water capture.</li> </ul>





# Antofagasta's Adaptation and Mitigation Response

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**We have committed to significant steps to both mitigate our climate change impacts and ensure our operations are resilient to expected changes in the climate. This includes setting long-term carbon neutrality targets, replacing diesel in our operations and switching to renewable electricity contracts.**

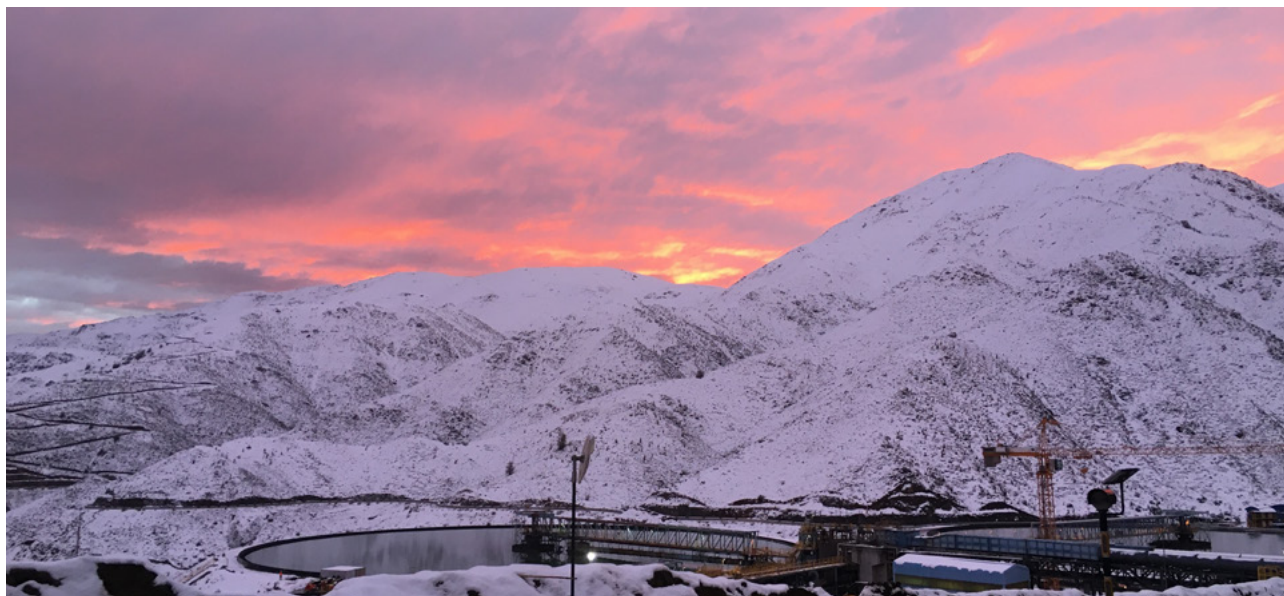


# Antofagasta's Adaptation and Mitigation Response

A key aspect of our climate change approach is to understand the risks so as to implement appropriate adaptation and mitigation 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.

In the short term, we have undertaken to have only renewable electricity contracts at our mining operations by 2022. This transition will reduce our exposure to the incremental increase in indirect costs since we will not be subject to the current carbon tax levied on electricity generators and passed on to us as customers. We also took measures to replace the diesel used in boilers with LNG as well as other energy efficiency measures to reduce our annual GHG emissions by 300,000 tonnes between 2018 and 2020. Through these measures, we have reduced emissions by 581,355 tCO<sub>2</sub>e, achieving the Mining division's target two years early, and have now launched a new target to reduce our Scope 1 and 2 GHG emissions by 30%, or 730,000 tonnes, of CO<sub>2</sub>e, by 2025, relative to 2020. This new target will keep us accountable as we seek to reduce our carbon footprint, help us to strengthen our climate resilience and contribute to global efforts to mitigate the worst impacts of climate change.

All our four mines are in water-stressed areas. We must address mitigation and adaptation measures considering the short and long-term availability of the resource. Our operations at Antucoya and Centinela use primarily sea water. At Centinela, we also use thickened



tailings technology to reduce consumption of water from continental sources. We expect that both sites will be fully reliant on sea water within the next few years. The Choapa Valley, where Los Pelambres is located, has been grappling with a drought for 12 years. To manage water shortages we have invested in a desalination plant, due to be completed in second half of 2022. We actively monitor water scarcity risk, which allows us to build in resilience to future water shortages. In September 2020 we announced that we would double the planned capacity of our desalination plant to produce 800 l/s of industrial water. As a result, we expect that, by 2025, sea and recycled water will cover 95% of Los Pelambres' consumption. Alongside these efforts, Antofagasta is sponsoring a multi-faculty research project on water sustainability at the Catholic University of Chile.

Our long-term target is to achieve operational carbon neutrality by 2050, in line with Chile's national target, or earlier. To achieve this, we will explore options to replace diesel with hydrogen-based alternatives in all our processes

and operations. This coincides with the Electromobility Plan we are currently developing, which aims to replace diesel for transport purposes at our mines. Due to the low maturity of these technologies today, we have conducted analyses to understand how realistic and feasible these options will be in the medium and long term. Based on this, we have begun to examine potential carbon-reduction measures that could be rolled out over the next 30 years. This will help us to understand how we can achieve long-term carbon-reduction targets in line with global climate ambition. Examples of measures include increased use of solar thermal energy instead of conventional sources, the introduction of hybrid mining trucks (CAEX) using diesel and LNG and, eventually, battery and hydrogen replacements for all operations, including mining equipment and trucks, once they become commercially available. To support the transition to green hydrogen solutions, Antofagasta joined the Chilean Hydrogen Association (H2 Chile) at the beginning of the year, becoming the first mining company in the country to do so.



An aerial photograph of a freight train traveling through a vast, arid desert landscape. The train, consisting of several locomotives and numerous flatcars loaded with large, cylindrical metal drums, winds its way across the dry, rocky terrain. In the background, a range of mountains is visible under a clear sky. The entire image is overlaid with a semi-transparent blue filter.

# Next Steps to Enhancing Resilience

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**We have set ourselves ambitious goals for strengthening our resilience to future physical and transition climate impacts, and will achieve full disclosure against TCFD recommendations.**





## Governance

In 2021, we will continue to strengthen climate-change leadership and accountability across our business. Engagement across the company is essential in order to deliver on our environmental commitments and fulfil our role in accelerating a low-carbon transition.

We have identified several key areas to enhance our governance processes:

- 1** Consolidation of communications channels and mechanisms on climate change from operational management to Committees and the Board as well as the formalisation of specific responsibilities;
- 2** Review of the purpose, scope and authority of Committees in relation to climate change management to ensure effective assessment and management of climate risks;
- 3** Further embedment of measures under the Environmental Management Model to ensure that climate-related issues are sufficiently managed within each mining operation and the Transport division.

In 2021, key climate change performance metrics will be linked to the performance scorecards of employees, ranging from senior executives to operation managers. This is a priority for us as we implement measures to incentivise management to progress on climate-related targets and ensure alignment with climate policies.



## Strategy

Our priority in 2021 is to further develop our climate scenario analysis. This will play a vital role in continuously informing our approach to climate resilience. It enables us not only to interpret possible futures that are relevant to our business context, but also to use the outputs to further embed climate considerations into our business planning process.

Following the completion of our qualitative climate scenario analysis, we have now identified climate-related risks and opportunities for both the high global warming and aggressive mitigation scenarios. We have also validated these with all the relevant Group and operations business functions. In 2021, we will select the most material risks and opportunities for quantitative scenario analysis in order to calculate the potential financial impact on our business. This will help us to achieve four key goals:

- 1** Focus mitigation and adaptation actions where climate risk is greatest;
- 2** Further embed climate considerations into decision-making processes by making related commercial risks tangible and comparable;
- 3** Further broaden our range of climate-related risk and performance metrics;
- 4** Enhance disclosure against TCFD recommendations.





## Risk Management

We will continue to review and monitor our risk management processes to ensure rigorous assessment of existing and emerging climate risks.

Through our better understanding of climate risks, we will further our appreciation of the positive impacts on the copper market and enhance our risk management processes. This will ensure that potential climate risks are considered and assessed as part of project feasibility studies.

We will continue monitoring our mitigation controls and short and long-term plans to ensure that we minimise the impacts of climate change on our operations and projects.



## Metrics and Targets

In 2021, we committed to two new GHG targets: the reduction of our Scope 1 and 2 emissions by 30%, or 730,000 tonnes of CO<sub>2</sub>e, by 2025 and carbon neutrality by 2050. We will begin to report progress towards these targets next year.

To achieve these targets, we will continue to implement energy efficiency and carbon-reduction measures in the short term. We will further develop our analyses of mitigation measures that are not yet commercially available but may become feasible in the medium to long term.

# Glossary

<b>CAEX</b>	▶ Mining trucks used for extraction of ore and waste.	<b>NDC</b>	▶ Nationally Determined Contributions. Non binding plans, policies or actions set out by countries to achieve global targets set by the Paris Agreement.
<b>CMIP-5</b>	▶ Coupled Model Intercomparison Project - Phase 5. A collaborative framework designed to improve knowledge of climate change organised by the World Climate Research Programme.	<b>Paris Agreement</b>	▶ A legally binding international treaty on climate change, adopted in December 2015 by 196 parties, which seeks to limit the rise in global temperature to well below 2°C.
<b>EBITDA</b>	▶ Earnings Before Interest, Taxes, Depreciation, and Amortization.	<b>R&amp;D</b>	▶ Research & Development.
<b>ECLP</b>	▶ Estrategia Climática de Largo Plazo (Long-Term Climate Strategy).	<b>RCP</b>	▶ Representative Concentration Pathway – a greenhouse gas concentration trajectory that can be linked to changes in climate.
<b>EMS</b>	▶ Energy Management Systems. Used to monitor, control and optimise the performance of energy generation or transmission systems.	<b>SBT</b>	▶ Science-Based Target, target in line with the latest climate science deemed necessary to meet the goals of the Paris Agreement.
<b>GCMs</b>	▶ Global Climate Models. Models constructed with the aim of describing climate behaviour based on scientific data, understanding or theory.	<b>Scope 1</b>	▶ Direct emissions from the Group's owned and controlled resources e.g. diesel from mining trucks.
<b>GHG</b>	▶ Greenhouse Gases. Anthropogenic gases such as carbon dioxide, methane and nitrous oxide that contribute to the warming of the planet.	<b>Scope 2</b>	▶ Indirect emissions from the generation of purchased energy e.g. electricity generated in and supplied from the power grid.
<b>ICMM</b>	▶ International Council on Mining and Metals.	<b>Scope 3</b>	▶ All other indirect emissions from activities not owned or controlled such as those of suppliers and customers in the Group's value chain.
<b>IEA</b>	▶ International Energy Agency.	<b>SDS</b>	▶ Sustainable Development Scenario – from the International Energy Agency.
<b>IPCC</b>	▶ Intergovernmental Panel on Climate Change.	<b>TCFD</b>	▶ Task Force on Climate-related Financial Disclosures.
<b>LNG</b>	▶ Liquefied natural gas. Methane which has been liquefied through cooling and pressurisation for use as an alternative fuel that is significantly lower in carbon emissions.	<b>tCO<sub>2</sub>e</b>	▶ Tonnes of carbon dioxide equivalent.
<b>MiCA</b>	▶ Mining Climate Assessment Tool developed by ICMM.		
<b>MW</b>	▶ Megawatt – unit of power		



ANTOFAGASTA PLC