

Climate change

In line with our purpose of developing mining for a better future, we are taking decisive steps to manage and mitigate the effects of climate change on our business and areas of influence.

HIGHLIGHTS 2020

- Our new Climate Change Strategy came into force in 2020.
- In July 2020, Zaldívar became our first mine to use only electricity generated from renewable sources.
- We have contributed to the creation of a university chair for research into water sustainability.

At Antofagasta Minerals, we take into account Chile’s particular vulnerability to climate change. Since 2019, our risk matrix has specifically included climate change and we have drawn up a comprehensive Climate Change Strategy, which was approved by the Board in 2020.

Thanks to this strategy, we will be able to take a multi-disciplinary approach to the challenges posed by climate change, improving coordination of the many initiatives, large and small, being implemented by the different areas of our operations. 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 preliminary plan of short, medium and long-term work. For example, resilience to climate change refers to the development of initiatives to adapt to the direct risks that climate change poses for the Group. The short-term actions related to this pillar include:

- Achieving a more in-depth understanding of the physical and transition risks for each operation under different temperature-increase scenarios
- Incorporating the risks into our risk management systems in greater detail
- Evaluating the impacts of climate change from the operational, financial and social standpoints.

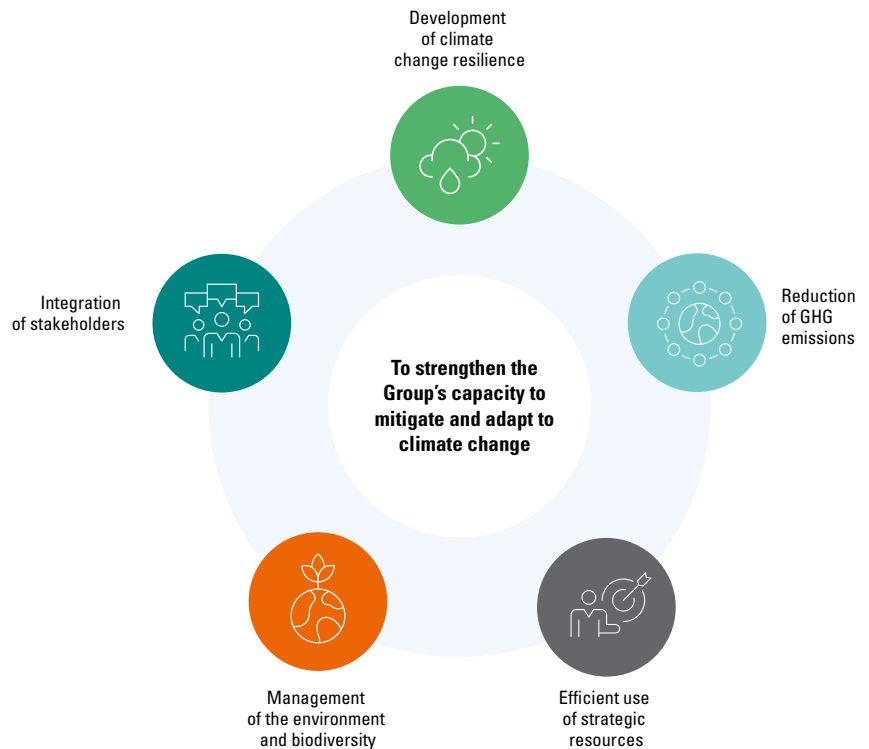
In the medium and long term, we anticipate that, with greater knowledge about the impacts of climate change, we will be able to progress in defining other areas of action under this pillar that will, for example, permit the implementation of measures to adapt the infrastructure and critical processes of our operations.

In 2021, we will publish a report with information about actions in relation to each pillar. It will also include our progress on implementing the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD).¹

In the context of our new Climate Change Strategy, we have created a Strategic Resources area within our Strategy and Innovation area. It will focus on the centralized management of the Group’s water and energy resources. Officially launched on 1 January 2021, its mission is to

provide a long-term vision for our use of water and energy. These two strategic resources are becoming ever more closely related as we replace continental water with sea water, with its energy implications in terms of desalination and the pumping of water to mine sites. This new area will also support the different operations in initiatives to increase their energy and water efficiency.

Climate Change Strategy



¹ Under these recommendations, companies should report the impacts of climate change on their operations and how these are being addressed in order to help financial markets understand if the impacts are correctly reflected in the valuation of their assets.



Photo: Iván Andrés Aguirre Villegas - Antucoya

Switching to renewable energy

In the early 2010s, in what was then a pioneering move in the mining industry, Los Pelambres spearheaded the construction of a wind farm and two solar plants. It has since sold its stake in these projects but they continue to supply it with electricity and, together with the mine's self-generating mineral conveyor belt, make a significant contribution to its energy consumption.

Over the past few years, our mining operations have gone on to renegotiate their power purchase agreements (PPAs) with generators, switching from conventional sources - principally coal - to renewables. In the first outcome of these renegotiations, Zaldívar became the first of the Group's mining operations to use electricity only from renewable energy sources, making the switch in July 2020.

It will be followed by Los Pelambres - with the exact date of its full switch depending on the start-up of a new hydroelectric plant - and by Antucoya and Centinela. As a result, all our mining operations' electricity consumption will be supplied from renewable sources as from 2022.

As part of the renegotiation of Centinela's PPA with energy multinational Engie, we reached an agreement to transfer our 40% stake in the Hornitos coal-fired power plant, located in the port of Mejillones in northern Chile, to Engie, which already owns the other 60%. The transfer will be completed in 2021.

Energy consumption and management

Energy represents some 17% of our mining operations' total operating costs. Out of this, approximately 12% corresponds to electricity and 5% to fuels, principally diesel. In 2020, our

electricity consumption reached 3,490 GWh, down from 3,557 GWh in 2019. This reflected a drop in copper production from its record level in 2019 as well as the implementation of energy efficiency initiatives.

Our Energy Management Strategy has three pillars:

- Supply security
- Competitiveness
- Energy efficiency and emission reduction

In 2020, work on the Strategy's consolidation included the incorporation of an Energy Portal, a platform that brings together data from all our four operations in a single place.

The energy efficiency projects implemented by our operations in 2020 included the installation of a variable frequency drive (VFD) for one of Los Pelambres' water pumps. This represented a saving of 1,548 MWh/year and the avoidance of 587 tCO₂e/year in emissions. Similarly, improvements to a pumping system at Zaldívar resulted in a saving of 1,525 MWh/year and the avoidance of 599 tCO₂e/year in emissions. In addition, Los Pelambres switched its milling and flotation plant from conventional to LED lighting, with its lower energy consumption, saving 745 MWh/year and avoiding the emission of 276 tCO₂e/year.

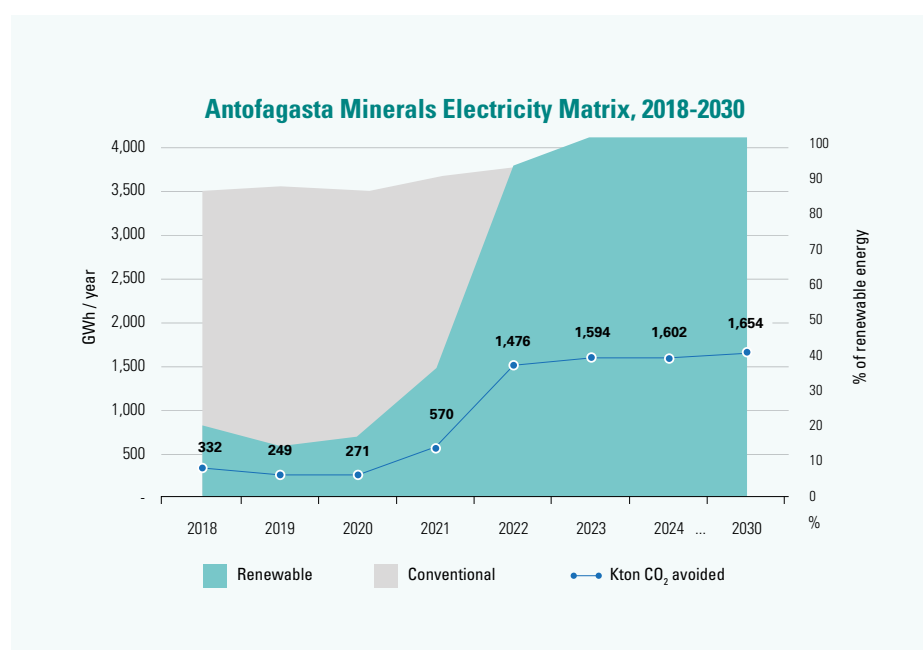




Photo: Roberto Jarpa - Antucoya

Reducing greenhouse gas emissions

Since 2017, we have been implementing a series of projects to reduce our direct and indirect CO₂ emissions (or Scope 1 and Scope 2 emissions)¹ by 300,000 tonnes by 2022. As of the end of 2020, we had reduced emissions by 581,353 tCO₂e, enabling us to meet the target established for the mining division.

The reduction of our Scope 2 emissions reflects the impact of energy efficiency projects implemented by all our mining operations. Another key factor was the integration of Chile's formerly separate electricity systems. This allowed lower-carbon energy from central and southern Chile to be brought to northern Chile where the Centinela, Antucoya and Zaldívar mines are located and significantly reduced their emissions.

The full switch of Zaldívar to renewably-generated electricity in July 2020 meant a reduction of 67,615 tCO₂e in our Scope 2 emissions. However, under the Corporate GHG Protocol Standard, this is not included in the reduction of 581,355 tCO₂e since, 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 average emissions factor of Chile's electricity system to calculate the emissions associated with our power consumption in 2020.

Our next challenge is to reduce our Scope 1 emissions, generated principally by the diesel used in mining vehicles and for heating the water and solutions used in different mineral treatment processes. Centinela and Antucoya have switched their boilers from diesel to liquefied natural gas (LNG) as a cleaner alternative. We are also looking at alternatives such as solar

energy and are closely monitoring the development of new technologies such as green hydrogen.

In 2021, we plan to identify gaps in data about our Scope 3 emissions and define the methodology we will use for their measurement as from 2022. These are the greenhouse gases associated with our inputs and products, but over which we do not have control and correspond to upstream and downstream activities such as the shipping of our products to customers.

CO₂ emissions (tonnes of CO₂ equivalent)¹

	Scope 1 direct emissions			Scope 2 indirect emissions			Total emissions			CO ₂ emissions intensity tCO ₂ e/tCu ²		
	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	603	825	1,189	711	931	1,191	-	-	-
Total	1,055,322	993,430	1,026,219	1,289,890	1,392,224	1,391,694	2,345,212	2,385,654	2,417,914	3.19	3.10	3.33

¹ Further information on our CO₂ emissions can be found on the Carbon Disclosure Project website (www.cdp.net).

² Tonnes of CO₂ equivalent per tonne of copper produced.

Water management and use

All our mining operations are in water-stressed areas. The efficient use of water is, therefore, a core part of our approach to mitigating and adapting to climate change as we seek to ensure sufficient water availability for our operations, local communities and conservation of the environment.

In response, we are increasing our use of sea water. Two of our mines - Centinela and Antucoya - already use raw sea water, extracted on the coast and pumped up to the mine sites. In 2020, this accounted for 86% and 97%¹ of their total consumption, respectively.

Los Pelambres will also begin to use sea water in 2022 when it completes construction of the first 400-l/s stage of a desalination plant on the coast of the Coquimbo Region. In 2020, we decided to double the plant's capacity to 800 l/s by 2025, which will enable Los Pelambres to cease water withdrawals from the Choapa River. As a result, sea water, in either raw or desalinated form, is expected to account for some 90% of our mines' total water consumption in 2025, up from 43% in 2020.

The Choapa Valley, where Los Pelambres is located, has been grappling with a drought for 12 years and the mine is actively participating in a Provincial Water Working Group established by the Regional Government to identify and implement solutions to improve the area's water security in the short, medium and long term. We also work directly with local communities to help them manage their water needs (see page 46).

In addition, Los Pelambres is co-financing a research consortium that, in 2019, won a bid to implement a five-year programme to develop sustainable solutions to water-related challenges, starting with the Choapa Valley but with a view to their subsequent application in the rest of the

Coquimbo Region and the neighbouring Atacama and Valparaíso Regions. In 2020, this public-private Quitai Anko consortium began work on five strategic projects that include the recharge of aquifers, a model for calculating the aquifer's water balance and the development of an integrated water information system to help ensure the supply and quality of rural drinking water. Over the course of the year, it also held a number of technical and outreach webinars on related subjects.

Our Zaldívar operation in northern Chile uses continental water, drawn from wells located some 100 km from the mine. These 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 extend them to 2031. The EIA is currently under evaluation by the environmental authorities.

Water consumption and management

In 2020, our operations consumed a total of 67.9 million m³ of water, up from 60.8 million m³ in 2019. The increase was explained principally by higher withdrawals of continental water at Los Pelambres in response to very low levels of water in the El Mauro tailings storage facility (from which water is recycled to the concentrator), an increase in the volume of mineral treated and the priority given to the use of continental water by local communities.

Water withdrawals from each source are measured in terms of both the rate of flow and volume in order to predict the source's behaviour and provide the authorities with compliance reports.

Water consumption by source (millions of m³)

Source	2020	2019	2018
Surface water	19.5	13.9	16.5
Groundwater	19.4	18.3	19.4
Third-party suppliers	0.009	0.4	0.9
Sea water	29.0	28.2	30.4
Total	67.9	60.8	67.2

We have continued to apply the ICMM's Water Stewardship Framework to reporting our direct water extraction. In addition, we report our water risk exposure in accordance with the requirements of the Water Programme of the Carbon Disclosure Project (CDP).

In 2020, we worked on the preparation of a Water Management Standard, which we expect to complete in 2021. This will form part of our new Climate Change Strategy.

Photo: Erick Francesconi Aravena - Minera Los Pelambres

University chair for water research

In November 2020, Antofagasta Minerals announced an endowment of \$1.5 million for the Antofagasta Minerals Chair of Water Sustainability at the Catholic University of Chile (UC). Through research and outreach activities, this private sector-university alliance seeks to contribute to water management throughout the country. It will enable the University to undertake multi-disciplinary research, bringing together disciplines that include engineering, agronomy and geography as well as the public health area of the UC's Faculty of Medicine.



1 Antucoya uses 100% raw sea water but, in line with the ICMM's Water Reporting Guide, the 3% of raw sea water retained in heaps is considered groundwater.