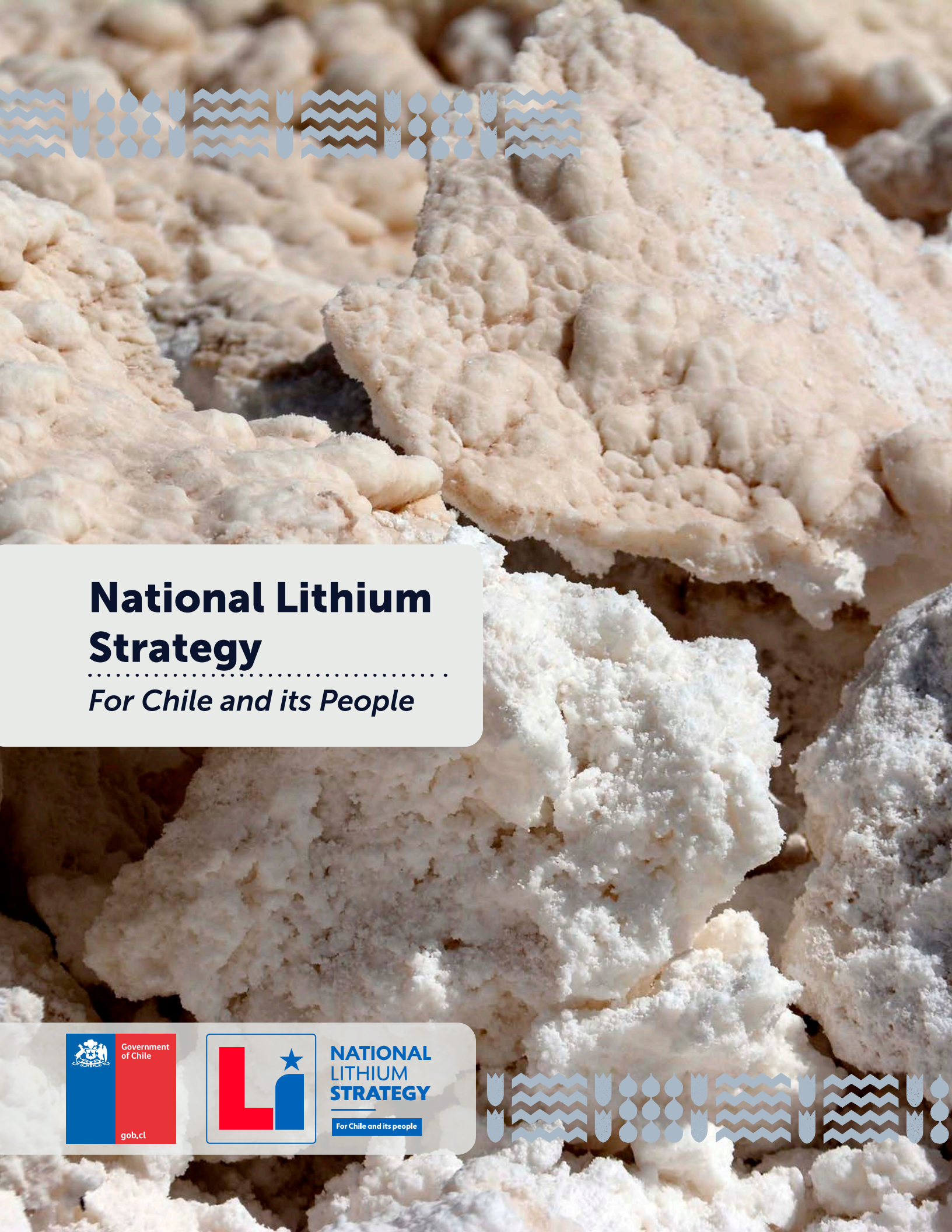

# National Lithium Strategy

*For Chile and its People*

Government of Chile

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NATIONAL LITHIUM STRATEGY

For Chile and its people

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# I. INTRODUCTION

# INTRODUCTION

Lithium has become a high-value strategic mineral due to its relevance in the current global energy transition, which requires energy storage solutions and decisive progress on electromobility. Energy transition goals are not expected to be met unless a sustainable supply of lithium is secured in the medium and long term.

Global lithium reserves and mining operations are currently highly concentrated in a small number of countries, and Chile has one of the world's largest reserves, located primarily in the Atacama Salt Flat.

This represents a major opportunity for the country and offers a roadmap for development in the coming years, as outlined in President Gabriel Boric's Government Manifesto.

Chile's National Lithium Strategy addresses this challenge and assumes responsibility for ensuring economically, environmentally, and socially sustainable progress in the development of the lithium industry. It also acknowledges that the salt flats holding Chile's lithium reserves are complex and unique ecosystems, important desert water reserves, and home to ancient peoples and cultures that must be respected and safeguarded.

Increasing global demand, high prices, and vast lithium reserves in Chile give us reason to be optimistic and in turn require us to act with a sense of urgency, ensuring that the development of this industry is environmentally friendly and respectful of surrounding communities. To achieve this goal, the development of Chile's lithium industry will be led by the State, with the private-sector participating as a strategic partner throughout the production process, ensuring that stringent social, environmental, transparency, and free competition standards are applied.

The creation of a National Lithium Company will coordinate future public-private partnerships, increasing Chile's lithium production, attracting new players, and expanding the industry through joint ventures. In the initial stages, state-owned companies Codelco and Enami will act as representatives of the State in the lithium industry, enabling the sustainable expansion of operations in the Atacama Salt Flat and the development of new projects in other Chilean salt flats.

We will seize this historic opportunity through public-private collaboration. Specifically, the State will provide a long-term strategic vision throughout the production cycle, from exploration to added value, in addition to clear regulations to ensure sustainability and reinvestment in the country's development. Meanwhile, private-sector players will contribute their industry knowledge and experience, capital, technological innovation, and market access.

The development of Chile's lithium industry must be seen as an opportunity to generate diverse goods and services supply chains that will promote the development of technologies and innovation (upstream or downstream), and other added-value activities in the supply chain, including sophisticated business operations and scientific activities. For example, the battery industry value chain may be developed through the production of cathode, anode, and electrolyte materials in Chile.

We are currently experiencing a cycle of high lithium prices. As such, the National Lithium Strategy aims to ensure responsible use of these funds, and will maintain orderly and sustainable public finances in the long term. For that reason, the temporary component of lithium revenue streams will be used to create a savings fund to finance social, technological, and industrial investments that promote Chile's sustainable and inclusive development.

We will use the funds generated by the lithium industry to drive our future development, transitioning toward a more diversified and knowledge-based economy, investing in science, technology, and innovation in this and other industries. The creation of a Public Technology and Research Institute for Lithium and Salt Flats, focused on research and development, will support transformations to foster a stronger, more competitive, and sustainable industry that will give rise to new investment opportunities. Knowledge and science will be the cornerstones that enable us to harness this resource in a responsible way for Chile's development, in line with the most stringent industry standards.

# II.
# BACKGROUND: LITHIUM AS A STRATEGIC RESOURCE

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The legal status of lithium is an exception in Chile's mining concession system. Through Law Decree No. 2,886 of 1979, Chilean legislation reserved lithium for the State, rendering lithium reserves non-concessionable. This regulation is also enshrined in Law No. 18,097 of 1982 and the Mining Code of 1983.

Minerals that cannot be concessioned can only be explored or extracted through one of the mechanisms established by Chile's Constitution in article 19, No. 24, section 10. That is, "directly by the State or state-owned companies, or through administrative concessions or special operation contracts, in line with the requirements and under the conditions established by the President of Chile for each case by supreme decree."

The original reason for which lithium was granted this unique status in Chile's legislation is due to its use in the generation of nuclear energy (Law No. 16,319). Additionally—as noted in the report produced by Chile's National Lithium Commission (2015)—lithium is of vital importance in the current global energy transition, which is based on non-conventional renewable energy generation and the use of electric energy storage solutions and electromobility.

As such, lithium has become a high-value strategic mineral. The consensus among scientists and world leaders is that global decarbonization goals will not be met unless a sustainable supply of lithium is secured in the medium and long term.

Global lithium reserves and mining operations are currently highly concentrated in a small number of countries. Chile has one of the world's largest reserves, and is the leading global lithium producer, after Australia.

As such, lithium is a strategic mineral for Chile for several reasons, including its importance in the global energy transition together with green hydrogen, and its regional and global geopolitical significance. For that reason, the development of this industry is a key priority which offers a unique opportunity for wealth creation in the country.

# III.
# DEVELOPMENT OPPORTUNITIES ARISING FROM PROGRESS TOWARDS A GREEN ECONOMY AND NEW EXTRACTION TECHNOLOGIES

# DEVELOPMENT OPPORTUNITIES ARISING FROM PROGRESS TOWARDS A GREEN ECONOMY AND NEW EXTRACTION TECHNOLOGIES

## I. New strategic uses of lithium and higher global demand

In addition to its traditional uses in the production of lubricating greases, glass, and ceramics, among other products, lithium has become a key raw material for the energy sector due to its unique physicochemical properties. The use of lithium in the following areas has opened significant opportunities for the lithium mining industry:

- Energy storage through its use in electric batteries and solar accumulators.
- Contribution to energy efficiency through its use in lightweight and resistant alloys for airplanes, ships, and automotive vehicles, such as aluminum-lithium alloys.
- Its use as a key component in the production of tritium, a fuel used in nuclear fusion.

The use of lithium in batteries is the main driver of the current high demand. This trend is set to continue as the use of fossil fuels is phased out in urban transport, particularly due to increased production of electric vehicles, and the need to store the power generated by non-conventional renewable energies (solar and wind).

Growing demand for lithium and the challenges experienced in increasing global supply have driven increases in the price of this mineral in recent years. In this scenario, many lithium mining projects are being developed in Australia, Argentina, and China[1] to increase global supply. However, it isn't clear whether this increased supply will be sufficient to meet growth in demand. As such, although the price of lithium is not expected to continue increasing at the same rate as it has in recent years, it will continue to reflect the strategic value of this mineral.

The high demand and increase in price of lithium generates incentives for technological change. Progress has been made on studying other active elements for battery production such as sodium- sulfur batteries. However, the most likely scenario is that lithium batteries will continue to lead the market in the coming decades. Similarly, energy vectors such as green hydrogen are not expected to constitute a threat to electric energy storage through batteries, but rather will act as complementary technologies.

[1] Source: Oferta y demanda de litio hacia 2030. Cochilco. 2020

## II. Abundant reserves

Chile has one of the world's largest lithium reserves, accounting for approximately 40% of the estimated global total. These reserves are in Chile's salt flats in the form of brine, together with other valuable minerals such as potassium, sodium, manganesium, boron, sulfates, and chlorides. In a study conducted in 2013, the National Geology and Mining Service (Sernageomin) found that Chile has exceptional geological potential for lithium mining: 63 saline environments (45 salt flats and 18 salt lakes) with diverse physicochemical and hydrogeological characteristics, located in coastal areas, interior regions between the Chilean Coastal Range and the Andes Mountains close to nitrate fields, and in Andean regions and high planes more than 3,000 meters above sea level.

Chile's largest lithium reserve, accounting for more than 90% of the country's total lithium deposits, is in the Atacama Salt Flat. This area offers the best conditions for lithium mining globally, due to its high concentration (approx. 2,000 ppm), the absence of contaminants, the high evaporation rate due to high solar radiation, low levels of rainfall, and aridity. As such, the Atacama Salt Flat offers ideal conditions for low-cost and efficient lithium mining operations.

Additionally, the study conducted by Sernageomin found that there are 18 other salt flats located in Chile's Antofagasta and Atacama regions that may be of interest to assess their geological potential for future lithium mining projects. In these cases, detailed exploration is required to increase knowledge of these areas.

## III. Development of new extraction technologies:

New requirements for the lithium mining industry, especially sustainability and environmental responsibility standards, constitute a unique opportunity for the country. The increase in global demand requires an expansion in lithium mining capacity, but this cannot continue for much longer with the current brine evaporation technology used, because the environmental impact.

Chile's position as a leading global lithium producer opens opportunities to make progress on upstream technological development with new extraction techniques (such as direct lithium extraction with brine reinjection, or DLE/R), which ensure the lowest possible social and environmental impact. These technologies are being developed and tested in various operations but have yet to be fully implemented on an industrial scale. Promoting such technologies is important for ensuring environmentally sustainable production. As such, their implementation in existing lithium mining operations and new projects should be an obligatory requirement.

These technologies not only open up opportunities in Chile for lithium mining innovation and technological development, but also give rise to the possibility of increasing current production levels while minimizing the impact on the environment. To achieve this, baselines must be established for Chile's salt flats, together with rigorous monitoring of the effects of implementing these technologies, in particular in relation to the biogeochemical composition of the brine reinjection.

In this development, the State—which has exclusive rights over lithium in Chile—can play a role not only in terms of environmental regulations and requirements, but also in terms of developing and pilot testing technologies and generating baselines (for example, hydrogeological models) which enable the performance of these new extraction techniques to be properly assessed.

## IV. Generation of a scientific-technological-industrial ecosystem

In addition to the above, opportunities in the development of knowledge and technology, together with the advancement of supply chains and added value associated with this industry, will enable the generation of a scientific-technological-industrial ecosystem. In principle, this ecosystem will be made up of lithium mining companies, academia, and both public and private science and technology institutes. The State will play a key role both in terms of financing and, in particular, generating public knowledge; early support for the development of technologies, innovations, and new ventures; and focusing research and development on the solution of industrial, environmental, and/or social challenges. For example, the absence of knowledge on microbiological ecosystems and their potential for innovation give rise to the opportunity for scientific discoveries based on saline ecosystems that may form a basis for future technological developments.

## V. Development of supply chains and added value

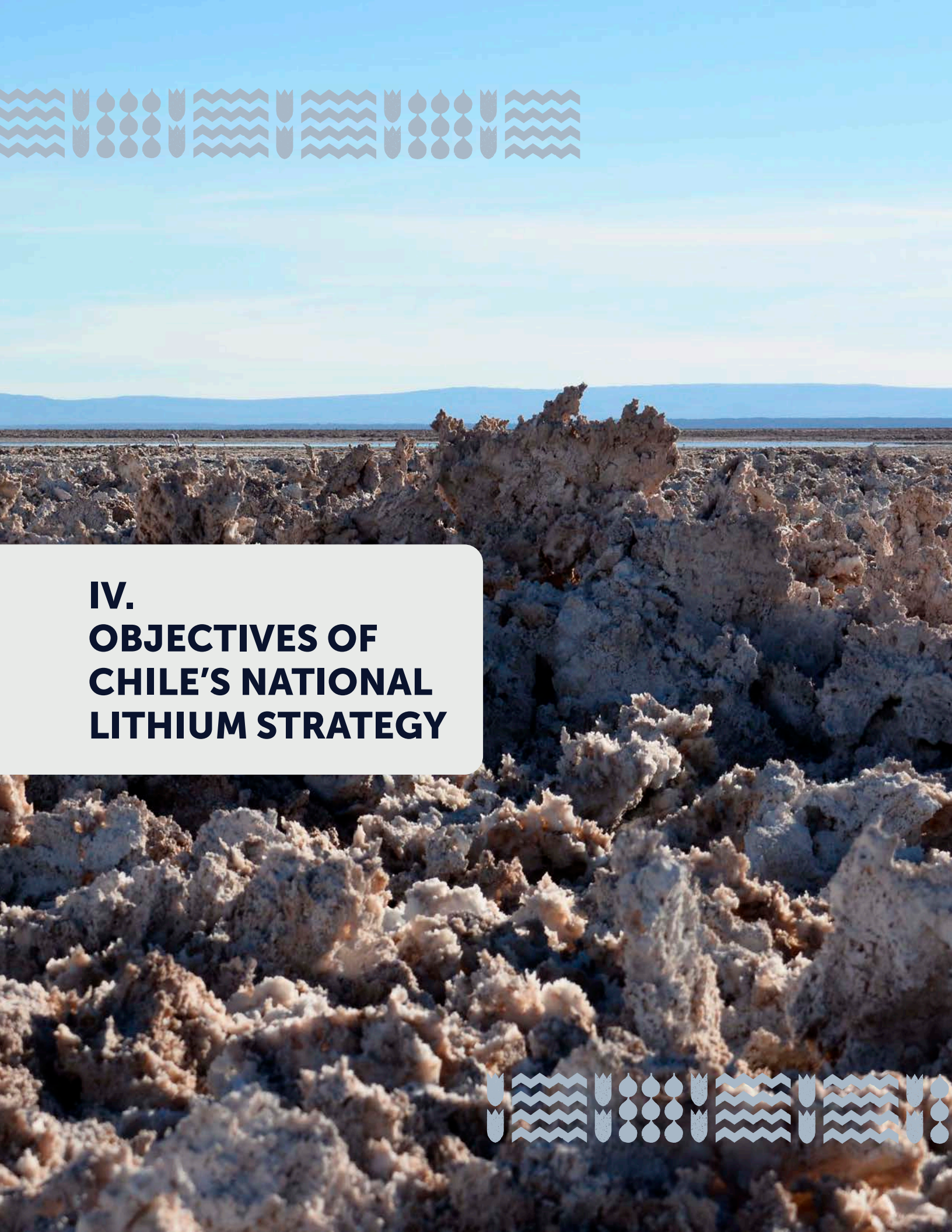
In economic terms, lithium constitutes not only an opportunity to fairly generate public revenue streams through royalties and taxes, but also an opportunity to make progress on industrial development and technological innovation that will enable Chile to consolidate its position as a leading global lithium producer.

The development of Chile's lithium industry must be seen as an opportunity to generate diverse goods and services supply chains that will promote the development of technologies and innovation (upstream or downstream), and other value-added activities in the supply chain, including sophisticated business operations and/or scientific activities. For example, the battery industry value chain may be developed through the production of cathode, anode, electrolyte metallic lithium and other materials in Chile. The positive results of Chilean economic development agency Corfo's call to use part of the reserved quotas[2] for value-added projects (awarded to private-sector Chinese company BYD) demonstrate that it is possible to develop the lithium value chain in Chile through a profitable business venture.

Major multinational companies in the battery manufacturing and electromobility sectors require a reliable long-term supply of lithium. This supply can be provided by the Chilean State through public-private partnerships with these companies for them to establish operations in Chile and collaborate in the development of the country's scientific-technological and industrial ecosystem.

These high-value-added supply chain opportunities or business activities may be developed in the areas where lithium mining operations are conducted, thus generating new opportunities for local development, productive employment, and infrastructure, in addition to the benefits provided by the investments themselves for local communities.

[2]Corfo's contracts with SQM and Albemarle reserve a portion of lithium production for sale at preferential prices to companies that establish operations in Chile in order to develop added-value projects in the lithium value chain.



# IV.
# OBJECTIVES OF CHILE'S NATIONAL LITHIUM STRATEGY

# OBJECTIVES OF CHILE'S NATIONAL LITHIUM STRATEGY

The urgent need to address the challenges posed by climate change and the energy transition has become a strategic opportunity for Chile, which has the potential to generate a major impact on the country's future economic and social development. Chile offers optimal conditions for the development of solar and wind energy, and is the world's leading producer of copper and lithium, two essential minerals for advancing the global energy transition. Specifically, the development of the lithium industry requires a comprehensive strategy that promotes harmonious, sustainable, and shared development.

The main objectives of Chile's National Lithium Strategy are outlined below.

### a. Sustainable development of lithium production potential

To harness the opportunities that lithium offers for Chile in a responsible way, it is essential to increase lithium production potential, ensuring maximum recovery, minimal environmental impact, and engagement and participation with local communities and indigenous peoples within the area of influence of each project. This requires investment in production capabilities, attracting new players, and introducing new extraction technologies that address the environmental and social challenges faced by the industry in Chile for current and future contracts or projects.

The increase of lithium production must make progress on two fronts simultaneously:

I. Generating the necessary conditions to increase production in the Atacama Salt Flat while also safeguarding the area's hydrogeological equilibrium.

II. Establishing the necessary conditions for the development of lithium mining projects in other salt flats, starting with the exploration of salt flats for which preliminary studies have already been conducted. These projects—which will require an in-depth study of potential environmental impact and the participation of regional governments and local communities—are expected to take between 6-8 years to initiate production.

It is especially important that this increase in lithium production potential is based on the use of technologies that minimize environmental impact.

To achieve this objective, producers in Chile can leverage more than 40 years of experience with lithium mining operations in salt flats, during which time the State has created and accumulated extensive knowledge and experience in the formulation and monitoring of contracts.

### b. Social and environmental sustainability

All mining activities require social and environmental impacts to be minimized and the participation of local communities to be ensured, and this is an essential condition for the development of the lithium industry. In Chile, lithium is extracted from the brine in salt flats, which has high levels of biodiversity and a delicate hydrogeological equilibrium that must be safeguarded. Communities and indigenous peoples also inhabit areas close to these salt flats.

As such, a new institutional framework for salt flats and lithium will be developed to update current standards and regulations. This framework will place special emphasis on sustainability aspects such as minimizing local freshwater consumption and guaranteeing the use of renewable energy such as solar and wind.

Salt flats are ecosystems whose intrinsic value goes beyond the minerals contained in brine. For that reason, the National Lithium Strategy specifies that biodiversity and hydrogeology baselines must be established prior to lithium mining operations. This will enable us to understand the potential impacts of lithium production, as well as develop biotechnology and innovation based on the extensive biological diversity that exists in salt flats and salt lakes, thus strengthening environmental conservation and cutting-edge scientific, cultural, and technological development for the Chilean people and future generations.

Of the total salt flat surface area in Chile, only 7.5% currently has official protected status. Similarly, a very low percentage of salt flats are considered priority sites by Chile's Environmental Impact Assessment System (SEIA).

In order to safeguard the long-term environmental sustainability of these ecosystems, a significant percentage of them will be protected, in line with the Convention on Biological Diversity's Global Biodiversity Framework. Additionally, the exclusion on developing lithium mining projects in protected areas or priority sites for biodiversity conservation will be maintained. To complement these safeguards, salt flat classification criteria will be proposed to ensure effective and comprehensive protection, including a systemic analysis of salt flats and measures to prevent their fragmentation.

### c. Technological and supply chain development

As outlined in President+ Gabriel Boric's Government Manifesto, the National Lithium Strategy must overcome the extractivist mentality, promoting technological and supply chain development with local companies, as well as more sophisticated business activities that generate productive employment. This will prevent the lithium industry from becoming an enclave economy.

Upstream supply chains involve the implementation of exploration and extraction tasks to develop knowledge and technologies associated with these activities in Chile, such as hydrogeological and physicochemical models of salt flats, with all the on-site work and instruments that this requires; the development and implementation of extraction methods that minimizes the environmental impact; renewable energy sources for operations; and water treatment (including desalination plants). Possible uses of other mineral elements in brine should also be considered, and the economic feasibility of their production explored.

In the case of downstream supply chains, Chile's lithium policy should consider the promotion of refining processes and obtaining chemicals from lithium, including lithium hydroxide and metallic lithium; the development of battery precursor materials; and even the initial stages of the battery value chain. The strategy should incentivize the mining and metals sectors that are necessary for battery production, such as cobalt, manganese, and rare earths, among others. Less traditional activities, such as new uses of lithium (lightweight aluminum-lithium alloys or isotopic separation of Li6, for example), as well as lithium recycling, should also be considered.

### d. Chile's participation in lithium revenue streams

An indispensable objective of the strategy is to maximize lithium revenue streams for the State in a sustainable way, and to achieve the highest possible amount of public revenue in the current lithium price cycle.

Promoting the growth of this industry and implementing a new public-private partnership model will enable an increase in public revenue, which can be used to finance social, technological, and industrial investments, while safeguarding macroeconomic equilibriums. Specifically, this will enable an increase in public spending on science, technology, and innovation, promoting sustainable and inclusive development in the future.

### e. Fiscal sustainability

In accordance with the established commitment to maintain orderly and sustainable public finances in the long term, the Chilean Government will make an adjustment in the calculation of public revenue from lithium. This adjustment is necessary, as the current methodology for calculating the cyclically adjusted balance recognizes all this revenue as structural, even though it contains a clearly temporary component. Failing to make this adjustment to public revenue from lithium would put fiscal sustainability at risk.

For that reason, this revenue will be reasonably adjusted through a simple rule to avoid spending of lithium revenue streams above a certain threshold, defined as the average revenue of the previous four years. In this way, the temporary component of lithium revenue streams will be placed in a savings fund to finance social, scientific-technological, and industrial investments.

### f. Diversification of industry players

The incorporation of new players in Chile's lithium industry, either from the private sector or via partnerships with the State, is fundamental to stimulate a more competitive, open, and transparent market that enables the development of a more efficient industry strongly committed to complying with the most stringent environmental and social standards.

Increased competition also offers better revenue prospects for the Chilean State, as companies or consortiums must offer the best possible conditions to participate in lithium mining operations. This could include not only technological or process improvements that are directly associated with lithium mining operations, but also the generation of supply chains, added value, local/regional development, and commitments with local communities.

The fact that each salt flat is different and unique—and as such tailored industry knowledge and developments are required for lithium mining operations—is also a motivation for the State to seek various private-sector partners for each project.

Furthermore, the presence of various industry players will also give rise to more partnership opportunities with different companies, supply chains, and global markets, especially for activities related to lithium battery manufacturing.

Finally, the diversification of industry players will ensure a better distribution of risks in the public-private partnerships undertaken by the State, with the appropriate geopolitical balance, as Chile's different trading partners will have opportunities to participate in this industry locally.

### g. Contribution to economic diversification and growth potential

The lithium industry's contribution to economic diversification and consequent increases in economic growth is also a priority objective of this strategy.

This objective complements the goal of generating supply chains to ensure that the development of this industry does not become an enclave economy, and poses an additional challenge: attempting to position Chile as a country on a more advanced level of the global lithium value chain.[3]

Breaking down the value chain into five stages—mining, refining, electrochemical processes, battery components, and battery assembly—Chile has a relevant market share in the first stage, participates in the second stage, and does not currently have any role in subsequent stages.[4]

Chile has a favorable position to progress in adding value. The country is home to one of the world's largest lithium reserves, which enables us to enter into negotiations with leading multinational technology companies and develop partnerships with them in order to offer lithium supply security in exchange for local industry development in Chile.

[3] A global value chain is a set of activities carried out in different geographic locations (regions, countries, etc.) that is necessary to produce a good or service. In the case of lithium-ion batteries for the automotive industry, for example, the value chain starts with the extraction of lithium from brine or hard rock. In Chile, lithium is extracted from brine and exported primarily as lithium carbonate (Li2CO3) or lithium hydroxide (LiOH). Subsequently, together with other minerals (copper, cobalt, nickel, and graphite, among others), components are manufactured (anodes, cathodes, separators) which are subsequently joined together to make a battery cell. The set of packaged cells are assembled to form an electric battery which stores the energy required by vehicles. Battery manufacturing involves three main production processes: battery cell manufacturing, battery module manufacturing, and battery assembly. Each of these stages can be conducted at a single site or in different geographic locations. However, battery assembly tends to be carried out near vehicle manufacturing facilities in order to reduce the cost of transporting the battery packs, as they are much bigger and heavier than the cells and modules. Source: Poveda Bonilla, R. (2021). Public policies for lithium innovation and added value in Chile.

[4] As a basis of comparison regarding the impact of this, the lithium mining industry (SQM, Albemarle, Livent, Tianqi, and Ganfeng, among others) is valued at between US$10 and US$15 billion, while the battery industry (CATL, LC Chemical, Samsung SDI, and Panasonic, among others) is valued at between US$45 and US$55 billion, and the automotive industry (Tesla, BYD, Volvo, and Volkswagen, among others) is valued at over US$400 billion.

# V. STRATEGIC PILLARS

# STRATEGIC PILLARS

The strategic pillars that will enable us to achieve the objectives posed are outlined below.

### a. Involvement of the State throughout the industrial cycle

The objectives stated in the National Lithium Strategy aim to boost the industry's dynamism, involving the State in the entire production cycle (exploration, operation, and manufacturing) through public-private partnerships and the development of associated value chains. To achieve this, the State must participate in lithium mining operations in the Atacama Salt Flat in the short term and promote the development of projects in other salt flats, in accordance with industry player diversification and environmental sustainability criteria.

The reasons which justify the State's participation in the production cycle are outlined below:

- In the exploration phase, an active role the State will enable knowledge to be generated regarding the quantity and quality of lithium reserves and environmental conditions, as well as the various challenges associated with each project. This will contribute to designing not only better contracts to ensure the highest possible profitability from lithium mining operations for the State and public participation strategies in the supply chain, but also the specification of scientific-technological, innovation, and industrial policies, as well as social and environmental regulations and requirements, and other functions of public institutions.
- State participation in the operation phase will enable it to better address the set of strategic decisions required to mitigate environmental and social risks, as well as the risk of the lithium industry becoming an enclave economy and increase the chance of success in terms of supply chains and harnessing opportunities for industrial development. It will also facilitate knowledge accumulation; the maximization of revenue for the State; access to accurate and reliable information on mining operations' profits and public revenue generated; understanding of associated costs, raw materials required, and sales; and the refining process. Additionally, it will give the State a strong position to enter into public-private partnerships with companies operating in the added-value phase.

The preferred way for the State to participate in the lithium industry is via the creation of a National Lithium Company. Prior to its creation, the State will participate in lithium exploration and operation in salt flats through state-owned mining companies Codelco and Enami. In both cases, these companies will create subsidiaries that are exclusively dedicated to the lithium industry with all necessary administrative, operational, and financial safeguards to undertake this task and facilitate the development of public-private partnerships.

Additionally, the discussion, drafting, and implementation of measures related to the industrial aspects of this strategy will be articulate by a Corfo Committee.

This committee will be responsible for proposing policies for scientific-technological and industrial development that facilitate new upstream and downstream lithium production activities, and identifying and harnessing of emerging opportunities.

### b. Capacity building

The harmonious and economically, socially, and environmentally sustainable development of the lithium industry requires the strengthening of a range of capacities. Some of these capacities may be considered to be public assets, in the extent that their development offers benefits for all industry players. As such they should be developed by an institution that is not involved in the production cycle to disseminate this knowledge publicly among all competitors and State institutions, including those responsible for assessment and decision-making and those responsible for regulation and oversight.

Knowledge and science hold the keys to understanding salt flats and conducting lithium mining operations in accordance with the highest standards. Through science and technology, we can develop and continuously improve these standards. Existing knowledge on lithium and salt flats in Chile is currently scarce and scattered among different specialized bodies, including the private sector, universities, technology and research institutes, and other public institutions such as the Chilean Nuclear Energy Commission (CCHEN), Sernageomin, and the General Water Department (DGA), in addition to Corfo, without any strategic coordination regarding their objectives and duties. The knowledge generated on lithium and salt flats is largely thanks to individual efforts, with scarce and temporary funding.

In this context, the creation of a public technology and research institute is recommended to generate and internalize knowledge on lithium and salt flats, including the lithium value chain. The main objective of this institute will be the generation of knowledge and technologies that enable, for example, improvements in extraction, production, and added-value processes; applications and recycling; better understanding of salt flats through the generation of robust models on their hydrogeology, biodiversity, and minimizing the impact associated with lithium extraction and processing. As such, the public technology and research institute will combine technological development efforts with research capabilities in ecology, geology, and social sciences related to salt flats, their biodiversity, and the communities that live near them.

This will contribute both to proper oversight and regulation of the sector, and efficient and informed decision-making where the State and its authorities require expert knowledge on these topics.

The institute will also collaborate with the lithium resource registration process that will be carried out by private and state-owned companies to provide both a general overview and detailed information on each salt flat. This knowledge will serve as an input for the adequate design of lithium mining contracts, including the creation of a list of salt flats and salt lakes that should be included in a Network of Protected Salt Flats. Furthermore, it will be responsible for collecting and making available information on lithium resources and exploration and operation projects, both in their formulation and design as well as implementation phases, in accordance with the provisions on access to information contained in the Escazú Agreement.

### c. Public-private partnerships

Since the Mining Concessions Law and Mining Code took effect, in 1983, lithium has been designated as a substance that is not eligible to be concessioned (except for the concessions managed by Corfo in the Atacama Salt Flat and Codelco in the Pedernales Salt Flat, which were granted prior to 1979). Therefore, lithium exploration and/or operation can only be carried out by the State directly; by state-owned companies; through administrative concessions; and through special lithium operation contracts in accordance with the requirements and under the conditions set by the President of the Republic in each case by supreme decree.

Although lithium in Chile is owned by the State, the private sector can contribute to lithium mining and added-value operations through their industry knowledge, commercial technology, and capital investments.

As such, while the creation of the National Lithium Company aims to develop some of these capacities for the State, the private sector's capacity must also be harnessed through the development of public-private partnerships that, by maximizing the financial and social returns of lithium mining, can align the objectives of private-sector players and the State.

The high profitability of lithium mining and the fact that lithium resources are not eligible to be concessioned in Chile give rise to a mutually beneficial relationship between public and private-sector interests, including in the exploration phase. Private-sector players that want to participate in the industry may be willing to enter into partnerships with the State, ceding a share of the operation and paying the corresponding royalties, given the industry's potential. In addition to participating in lithium mining operations, the State will contribute a long-term vision regarding the country's development, promoting the enhancement of technological capabilities, supply chains, and added value, while ensuring the protection of ecosystems and local communities.

- Types of public-private partnerships

There are many possible types of public-private partnerships and mechanisms for selecting private-sector partners, depending on the characteristics of each salt flat, the activities to be carried out (exploration versus operation), and the presence of incumbents. Nevertheless, all these partnerships must promote the objectives set out in this strategy, and public interest will be a decisive factor in the decisions made. To ensure the State's involvement throughout the lithium production cycle, this strategy recommends the formation of public-private partnerships through joint-ventures.

The various salt flats with potential for lithium mining are outlined below, together with the recommended type of public-private partnership and a mechanism for selecting partners.

As indicated above, there are two salt flats with lithium reserves that were concessioned prior to 1979, and the holders of these concessions can conduct mining operations without requiring a special State permit or lithium operation contract. These reserves are managed by Codelco in the Pedernales Salt Flat and Corfo in the Atacama Salt Flat.

- Salt flats with lithium reserves concessioned prior to 1979: Pedernales and Atacama

In the Pedernales Salt Flat, a subsidiary of Codelco could develop a lithium mining project on its own or through a public-private partnership to initiate exploration and operation.

The case of the Atacama Salt Flat is especially relevant for Chile, not only because it is home to the largest identified lithium reserves in the country, but it is also the only salt flat with ongoing lithium mining operations, constituting an important source of public revenue.

Against this backdrop, it is important to note that the lithium reserves in the Atacama Salt Flat are managed by the State through Corfo, and are extracted through lease agreements with SQM Salar and Albemarle S.A, which expire in 2030 and 2043, respectively.

As such, the following urgent actions must be undertaken in relation to these agreements, especially in light of one contract due to expire in 2030: (I) ensuring continuity of lithium mining operations in the Atacama Salt Flat; (II) increasing lithium production in a sustainable way; and (III) ensuring State participation in lithium production.

As such, while fully respecting the contracts in force between Corfo and both companies, negotiations must be initiated with these parties, considering the specific situation of each.

- Salt flats without lithium mining concessions

No lithium mining concessions have been granted for the remaining salt flats in Chile, and as such any exploration or extraction operation with the participation of private-sector players will require a special lithium operation contract.

The State has asked Codelco to find an optimal solution for the development of projects in the Maricunga Salt Flat with interested parties.

In the Aguilar, Infieles, La Isla, Las Parinas, and Grande salt flats, Enami has requested Chile's Ministry of Mining to be granted a special lithium operation contract to develop the "Cinco Salares Project".

Notwithstanding any future decisions regarding the Network of Protected Salt Flats, the State will tender projects to identify lithium resources in those salt flats where preliminary studies on their potential have already been conducted, granting special lithium exploration contracts to private-sector companies. This tender will be public, competitive, and transparent, and technical bids must include, among other requirements: reports and instruments to provide updates on the information collected to the State, a proposal for a local and supply chain value creation plan, and an estimation of the environmental impacts associated with each project. Finally, public-private partnerships may also compete in tenders for exploration contracts that will enable them to conduct lithium extraction in the future.

The granting of exploration contracts is due to the need to make swift progress on the identification of available resources in order to develop lithium mining operations. If the results of this exploration indicate potential for lithium extraction, the private-sector player that was awarded the exploration contract will have the option of first refusal for future lithium mining projects in that specific salar in partnership with a state-owned company (the National Lithium Company or subsidiaries of Codelco or Enami). In those salt flats that subsequently defined as strategic, the State will maintain a majority share in any such partnerships.

### d. Institutional framework

A key aspect of the strategy involves making progress on structuring the institutional framework for lithium and salt flats to enable the development and growth of the industry with a minimum environmental impact and fully respecting local communities and indigenous peoples. This undertaking was initiated between May and October 2022 by an Interministerial Task Force, which identified the main gaps in this area. This task force concluded that a review is required of regulatory aspects, the operation of regulatory bodies, and the relationship between decisions made by the central government and regional and local governments.

Chile has extensive and robust experience in underground hard-rock mining, which is governed by the Mining Code and associated regulations, as well as specific bodies and procedures that have been created for this purpose. However, in the case of lithium, which is obtained from brines in salt flats, many of the regulations that are in place for underground hard-rock mining do not apply. This matter must be addressed urgently.

The public bodies whose roles and duties are related to lithium and salt flats also require review. These institutions have a range of duties (oversight, regulation, or advisory) which have been incorporated over time. For this reason, the institutional framework must be restructured to address the complexity and importance of salt flats and activities related to brine extraction and lithium mining.

### e. Social sustainability: Community engagement

To ensure the sustainability of lithium mining in Chile, the State must establish and promote adoption of the most stringent social and environmental standards. This requires opportunities for engagement and participation with all stakeholders interested in submitting their opinions for the discussion of this strategy, especially indigenous communities related to salt flats.

This engagement and participation process will aim to identify the concerns and expectations of various stakeholders regarding the development of the lithium industry, which will contribute to the recommendations for modernization of the institution framework to ensure the sector's sustainable development, including the creation of the National Lithium Company and the specific activities to be carried out by the Public Technology and Research Institute for Lithium and Salt Flats.

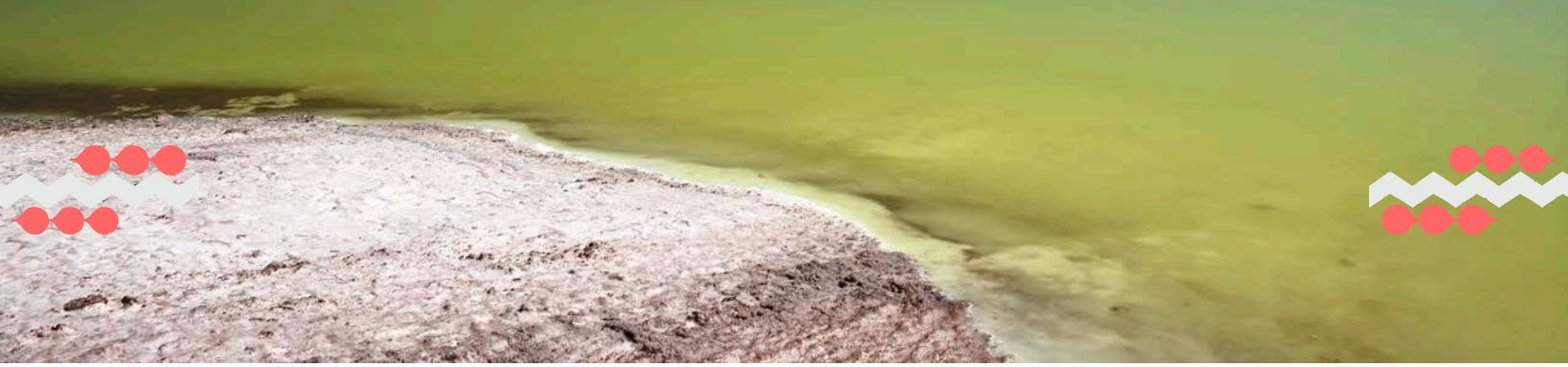
As such, the implementation of this strategy will be accompanied by an engagement process with all stakeholders, including indigenous communities, academia and scientific institutions, civil society organizations, companies, and grassroots organizations. This engagement process will be implemented under the framework of international agreements ratified by Chile (ILO Convention 169 and the Escazú Agreement); international standards for stakeholder engagement in the mining industry; Chilean regulations on the implementation of public participation processes with the plans, policies, and programs developed by the Ministry of Mining; and human rights plans.

The application of these principles will provide legitimacy in discussions with local communities, offering greater legal certainty in future regulatory and legislative efforts. This participation process will be led by the Ministry of Mining, with the support of the Ministry of the Environment and Ministry of Social Development in its design and implementation.

The executive branch will be responsible for:

- Generating a new institutional framework which incorporates these guidelines and provides coherence to the objectives of this strategy. The reports prepared by the National Lithium Commission in 2015 and the Interministerial Task Force led by the Ministry of Mining in 2022 will also be considered.
- Generating the necessary conditions to transfer this knowledge organically to State institutions, given the long-term nature of this strategy.

# VI.
# IMPLEMENTATION: STRATEGIC MILESTONES 2023-2024



# IMPLEMENTATION: STRATEGIC MILESTONES 2023-2024

The strategic pillars outlined above, in line with the objectives of this strategy, must be implemented through a range of specific actions.

**The main actions to be implemented include:**

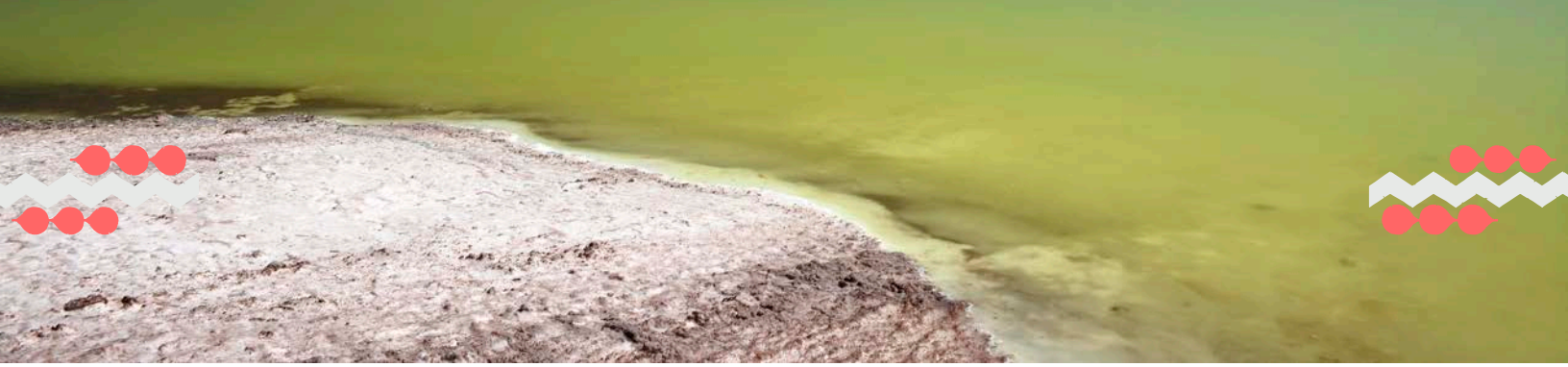
**1. The creation of a Strategic Committee for Lithium and Salt Flats,** led by the Ministry of Mining with the participation of several other ministries (Finance, Economy, Foreign Affairs, Environment, and Science) and Corfo, in order to oversee the implementation of the various actions contained in the strategy. This committee will also establish the means of coordination with other ministries, public institutions, regional governments, and the private sector.

For this purpose, this committee will hold the status of a Corfo committee, enabling the promotion of policies for scientific-technological and industrial development that facilitate the advancement of new upstream and downstream lithium production activities, and the identification and harnessing of local supply chain and added-value opportunities in the industry.

**2. Initiation of a stakeholder engagement and participation process with stakeholders,** including representatives of local communities and indigenous peoples, regional governments, academia and scientific institutions, private-sector companies, and civil society, as well as the central government and other public agencies. This process will enable us to better understand the expectations and proposals of different stakeholders, including indigenous communities, regarding the industry's development. The results of this process will contribute to decisions that must be made in relation to institutional modernization to ensure the sustainable development of the lithium industry, including the creation of the National Lithium Company and the specific activities to be undertaken by the Public Technology and Research Institute for Lithium and Salt Flats.

International agreements ratified by Chile (ILO Convention 169, Escazú Agreement), international standards for stakeholder engagement in the mining industry, and the Ministry of Mining and Ministry of the Environment's regulations on public participation processes and human rights plans will be used as a framework for designing this process.

**3. Creation of the National Lithium Company,** which will be able to participate in the entire lithium production cycle, from exploration and operation to processing and downstream industrial stages such as battery cell assembly and recycling. The National Lithium Company will be a state-owned company that will seek private-sector partners for the sustainable development of exploration, operation, and added-value projects. It will also promote technological development in all areas of the value chain.



**4. Creation of a Network of Protected Salt Flats** and, in salt flats with current lithium mining operations, guaranteeing the use of technologies that have a low environmental impact. Salt flats are complex, unique, and highly biodiverse ecosystems that are suffering from significant degradation, both globally and in Chile, highlighting our obligation to ensure the long-term environmental sustainability of these ecosystems.

For that reason, the strategy includes the creation of a Network of Protected Salt Flats composed of at least 30% of these ecosystems by 2030, in line with the international obligations established in the Convention on Biological Diversity's Global Biodiversity Framework.

To achieve this goal, the Strategic Committee for Lithium and Salt Flats, will commission studies on the ecosystem potential of each salt flat and salt lake to determine whether they should be authorized for industrial activity or preserved. These studies will be conducted by the competent State agencies, including the recently created Natural Capital Committee. The Public Technology and Research Institute for Lithium and Salt Flats will be responsible for centralizing the information contained in these records.

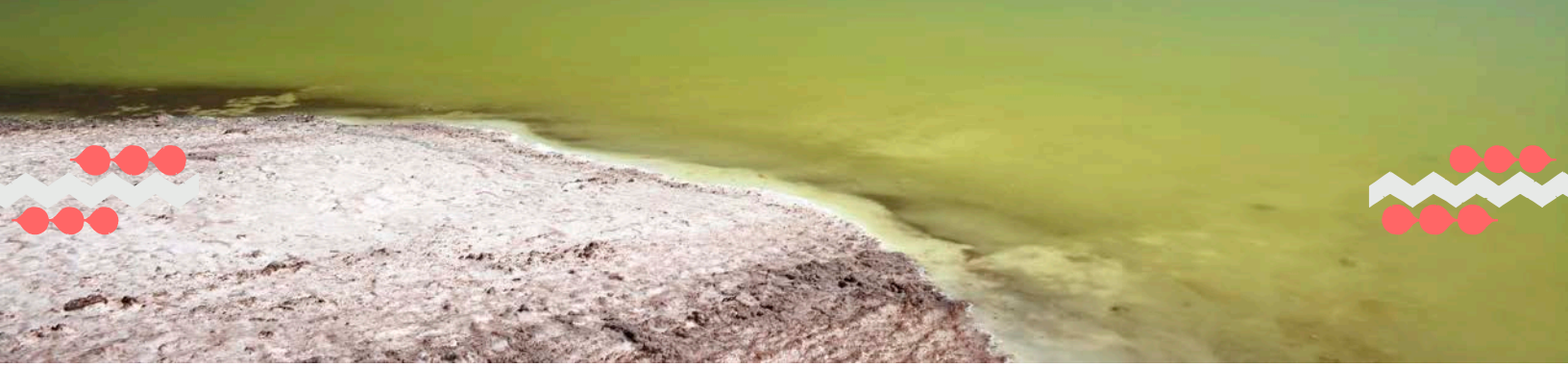
In those salt flats with ongoing lithium mining operations, the implementation of technologies that minimize the environmental impact will be required and the reduction of freshwater use. The biogeochemical effects of these techniques will also be monitored.

Additionally, proceedings will be initiated to incorporate Chile in the Extractive Industries Transparency Initiative (EITI), to guarantee the highest possible level of transparency and probity in all mining industries, including lithium, in line with the most stringent international standards.

**5. Modernization of the institutional framework.** A proposal will be prepared to modernize the institutional framework to facilitate the industry's development and growth, reduce the impacts on salt flats and communities, provide coherence to existing and new public bodies, and govern the relationship between decisions made by the central government and regional and local governments, in accordance with the objectives of this strategy. The report prepared by the National Lithium Commission in 2015 and the Interministerial Task Force led by the Ministry of Mining in 2022 will be reviewed as part of this proposal, in addition to the results of the dialogue processes.

**6. Creation of a Public Technology and Research Institute for Lithium and Salt Flats,** whose main objective is the generation of knowledge and technologies that enable extraction, production, added-value, applications, and recycling processes to be improved, as well as increasing the understanding and protection of salt flats through the generation of public ecosystem baselines.

This institute will combine these efforts with the development of research capabilities in ecology, geology, and social sciences related to salt flats and their communities, contributing to the proper conservation, oversight, and regulation of the industry, and efficient and informed decision-making by the State.



The Public Technology and Research Institute for Lithium and Salt Flats will also collaborate in the registration of resources and other environmental requirements for private-sector and state-owned companies. Furthermore, it will be responsible for collecting and making available information on natural resources and exploration and operation projects, both in their formulation and design as well as implementation phases, in accordance with the provisions on access to environmental information contained in the Escazú Agreement.

**7. Involvement of the State in Atacama Salt Flat production activities.** As the lease agreement for a large part of the Atacama Salt Flat to private-sector players will expire in 2030, the State can immediately initiate negotiations to participate in lithium mining activities through public-private coordination for the benefit of Chile and its development.

Within this framework, Corfo will ask Codelco to assess the most effective ways for the State to participate in lithium extraction in the Atacama Salt Flat, firstly through negotiations with SQM, whose contract expires in 2030.

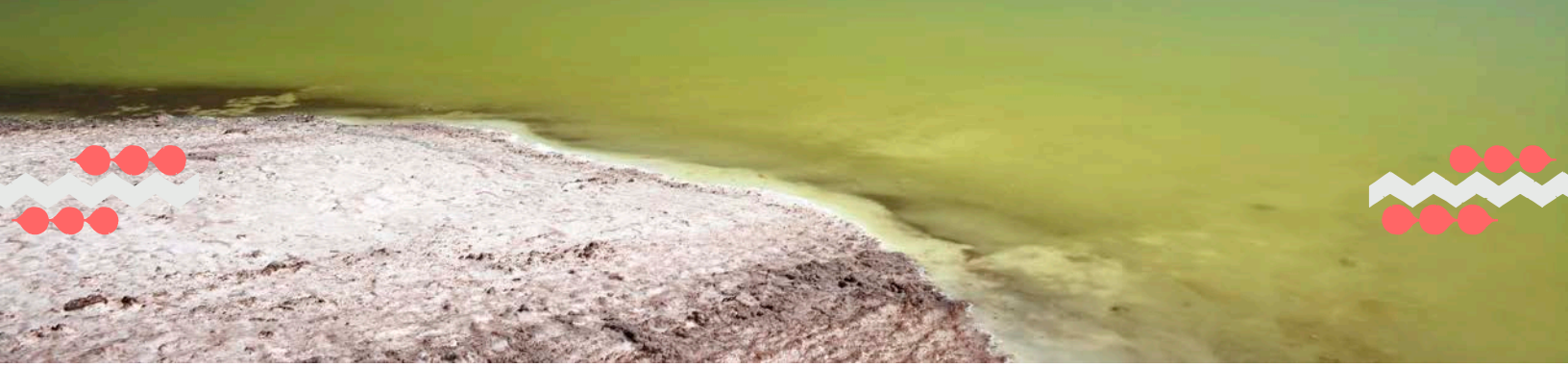
Two key considerations have been established in that regard: firstly, the State will hold a majority share in any public-private partnerships created for lithium mining operations in the Atacama Salt Flat; and secondly, the Chilean State is committed to fully respecting the provisions of current contracts. That is, State participation in the Atacama Salt Flat prior to the expiration of current contracts will only be possible through an agreement with the companies that currently hold lithium mining rights.

Finally, the new lease agreements will take the conditions of current contracts as minimum requirements, considering the revenue currently obtained by the State and the benefits provided to regional governments, local governments, and communities living in close proximity to the Atacama Salt Flat; Research and Development contributions; and reserved quotas at a preferential price for the development of added-value projects in Chile. They will also establish new social and environmental standards.

**8. Prospecting in other salt flats.** The resources available in other salt flats must be identified, and the conditions necessary for potential lithium extraction to be carried out in a responsible and sustainable way must be generated, provided that the deposits are not located in the Network of Protected Salt Flats.

For lithium mining projects that are of strategic value to the country, public-private partnerships will be established with the State controlling production decisions.

The conditions and benefits for the State and local communities that are established in the current contracts entered into by Corfo in the Atacama Salt Flat (resources for communities, regional governments, local governments, and research and development) will be considered as minimum requirements for all projects, in addition to environmental and technological requirements, and quotas for added-value projects, among others.



Under this framework:

**a.** Special lithium exploration and operation contracts will be granted to subsidiaries of state-owned companies Codelco and Enami in salt flats where projects are currently ongoing in different phases of development.

**b.** For other salt flats that are eligible for lithium extraction (in accordance with conservation restrictions), a transparent public tender process will be initiated with private-sector companies for exploration contracts. If the results of this exploration indicate potential for lithium extraction, the private-sector player that was awarded the exploration contract will have first refusal to partner with a state-owned company for the operation phase. In the case of projects of strategic value for the country, the State will hold a majority share in these partnerships.

This process will accelerate exploration of Chile's salt flats, and provide an opportunity for various domestic and international players that are interested in entering the industry. The bids submitted in exploration tenders must also include a proposal for a local and supply chain value creation plan that will be implemented in the subsequent lithium mining project, to prioritize initiatives that offer greater benefits for local supply chains, technological development, and added value.

# VII. NATIONAL LITHIUM STRATEGY IMPLEMENTATION SCHEDULE

# NATIONAL LITHIUM STRATEGY IMPLEMENTATION SCHEDULE

This section provides an implementation schedule for the National Lithium Strategy and its various actions, in particular the roles that will be played by each ministry and some suggestions on the next steps to follow.

- **Creation of the Strategic Committee for Lithium and Salt Flats**

| | |
|---|---|
| Led by: | Corfo |
| Other public bodies involved: | • Ministry of Mining<br>• Ministry of Finance<br>• Ministry of Economy<br>• Ministry of Foreign Affairs<br>• Ministry of the Environment<br>• Ministry of Science, Technology, Knowledge, and Innovation |

This committee, which will be created in May 2023, will be responsible for implementing the strategy and will hold the status of a Corfo committee.

- **Negotiation for a public–private partnership in the Atacama Salt Flat**

| | |
|---|---|
| Led by: | Codelco and Corfo |

To be initiated in the first half of 2023.

- **Initiation of stakeholder engagement and participation processes**

| | |
|---|---|
| Led by: | Ministry of Mining |
| Other public bodies involved: | • Ministry of Social Development and Family<br>• Ministry of the Environment<br>• Corfo |

This engagement process will be implemented during 2023, and will include four stages:

- Preparation and calls to attend
- Participation process
- Integration and systematization
- Dissemination of the results of the process

- **Creation of a Public Technology and Research Institute for Lithium and Salt Flats**

| | |
|---|---|
| Led by: | Ministry of Mining |
| Other public bodies involved: | • Ministry of Science and Technology<br>• Ministry of Economy<br>• Ministry of the Environment<br>• Corfo |

A technical committee will be established for the creation of the Public Technology and Research Institute for Lithium and Salt Flats, made up by the aforementioned ministries and institutions, in addition to other public bodies, regional governments, universities, and R&D&I ecosystem players.

It is expected to be launched in the first half of 2024.

### Prospecting in other salt flats

| | |
|---|---|
| Led by: | Ministry of Mining |
| Other public bodies involved: | • Ministry of Economy<br>• Ministry of the Environment<br>• Corfo<br>• Codelco<br>• Enami |

The resources available in other salt flats must be identified, and the necessary conditions for their sustainable extraction must be generated. To achieve this, public-private partnerships will be established with the State controlling production decisions. This will be implemented as follows:

**a.** Starting in 2023, special lithium exploration and operation contracts will be granted to subsidiaries of state-owned companies Codelco and Enami in salt flats where projects are currently ongoing in different phases of development. These companies may decide whether to partner with a private-sector player.

**b.** Tendering of exploration contracts to private-sector players starting in the first half of 2024 for those salt flats registered by Sernageomin that are eligible for lithium extraction.

### Creation of a Network of Protected Salt Flats

| | |
|---|---|
| Led by: | Ministry of the Environment |
| Other public bodies involved: | • Ministry of Mining<br>• Ministry of Economy<br>• Ministry of Science, Technology, Knowledge, and Innovation |

During 2023, the criteria and procedures for defining protected areas and their status will be defined.

### Introduction of a bill to create the National Lithium Company

| | |
|---|---|
| Led by: | Ministry of Mining |
| Other public bodies involved: | • Ministry General Secretariat of the Presidency<br>• Ministry of Finance<br>• Ministry of Economy<br>• Corfo |

The bill will be introduced at the end of 2023, having received inputs during the dialogue process.

- **Modernization of the institutional and regulatory framework for optimal development of the lithium industry**

| | |
|---|---|
| Led by: | Ministerio de Minería |
| Other public bodies involved: | • Ministry General Secretariat of the Presidency<br>• Ministry of Finance<br>• Ministry of Economy<br>• Ministry of Energy<br>• Ministry of the Environment<br>• Ministry of Public Works<br>• Ministry of Science, Technology, Knowledge, and Innovation<br>• Corfo |

This initiative aims to modify and adapt the regulations that govern the industry and its institutions (including CCHEN, DGA, Sernageomin, the Ministry of Mining, and environmental oversight bodies), and will be introduced during the first half of 2024.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