



ARGENTINA LEADS THE GLOBAL LITHIUM RUSH: ARE THE PIECES IN PLACE FOR A SUCCESSFUL OUTCOME?

INTRODUCTION

Lithium is a technologically important element used in ceramics, glass, lubricants, light-weight alloys, medicine, and batteries¹. It is estimated that in total, batteries constitute 74% of the global end-use market².

According to the World Bank, lithium production may need to increase by nearly 500% by 2050 to meet the growing demand for clean energy technologies³. The EU projects that for electric vehicle batteries and energy storage, European Union members may need up to 18 times more lithium by 2030 and almost 60 times more lithium by 2050, compared to the current supply to the whole EU economy⁴.

The US Department of Interior lists lithium as one of the 50 minerals critical to US security and economic growth⁵. It is also included in the European Commission 2020 list of critical raw materials⁶. Lithium is projected to surge in demand even further in the coming decades if it becomes the choice for storing power from intermittent electricity generation from solar PV and wind farms (including grid and decentralized operations), in addition to its immediate use to power electric vehicles.⁷

¹ Lee Ann Munk., Scott A. Hynek, Dwight C. Bradley, David Boutt, Keith Labay, and Hillary Jochens, *Lithium Brines: A Global Perspective*, Reviews in Economic Geology, vol. 18, page 339, available at https://www.researchgate.net/profile/David-Boutt/publication/336536185_Lithium_BrinesA_Global_Perspective/links/608779cb8ea909241e28c715/Lithium-BrinesA-Global-Perspective.pdf
2016. Page 339

² Supra, note 8, at page 100.

³ Supra, note 8.

⁴ Supra, note 9, at page 6.

⁵ *US Geological Survey Releases 2022 List of Critical Minerals*, U.S. Geological Survey (Feb. 22, 2022), available at <https://www.usgs.gov/news/national-news-release/us-geological-survey-releases-2022-list-critical-minerals>.

⁶ *Critical Raw Materials Resilience: Charting a Path towards greater Security and Sustainability*, European Commission (Mar 9, 2020), available at <https://ec.europa.eu/docsroom/documents/42849>.

⁷ *Minerals for Climate Action: The Mineral Intensity of the Clean Energy Transition*, World Bank Group (2020), available at <https://pubdocs.worldbank.org/en/961711588875536384/Minerals-for-Climate-Action-The-Mineral-Intensity-of-the-Clean-Energy-Transition.pdf>.

Given the importance of lithium in technologies needed for a transition to renewable energy, all the conditions are in place for a classic “land rush” or “mining boom” aimed at lithium. In that scenario, it is critical to look carefully at the potential issues that may arise in rapid large-scale development of lithium, and how the country is prepared to face those challenges.

Past mining booms have had severe economic, social and environmental consequences. The massive investment that lithium development will bring can be the motor for economic opportunity, or can be lost, depending on whether the elements of good natural resource governance are in place. The purpose of this proposal is to examine precisely that question, now, before development gets any farther ahead of management.

ARGENTINA’S POSITION IN TERMS OF LITHIUM RESERVES AND PRODUCTION

The three main types of exploitable lithium deposits are (1) continental brines, (2) pegmatites, and (3) hydrothermally altered clays.⁸

Brines, which are waters with high concentrations of inorganic salts (in this case chlorides)⁹, are the most substantial of the potential lithium resources, accounting for nearly 70% of global lithium reserves. The largest brine reserves are located in the so-called Lithium Triangle countries (Bolivia, Argentina, and Chile), with 65% of the total world resource.¹⁰

The most intense current focus is on the continental brines in the “lithium triangle” countries, in part because they have lower production costs than pegmatite projects.

Within the three “lithium triangle” countries, it appears that development is occurring fastest in Argentina. Chile, with the largest reserves and a current production about three times the Argentinian, has declared lithium “strategic” decades ago¹¹, and has gone through many political discussions around the state role, attempting to leverage its position to capture a larger part of the value chain for lithium projects (for example, imposing obligation to sell quotas at preferential prices to incentivize manufacturing lithium batteries in Chile). These attempts imply more state involvement and have resulted in complexity for private investors. Whatever the ultimate outcome, development is slower in Chile than in Argentina.

In Bolivia, the development of lithium industry is yet in early stages. The characteristics of the brine entail some technological challenges. But the main reason for the slow pace is related to political decisions. Basically, the production of lithium is controlled by the state, with little room for private investors and lots of pressure to develop the manufacturing of batteries in country.

⁸ Supra, note 9.

⁹ Ernesto J. Calvo, *Litio, un recurso estratégico para el mundo actual*, Ciencia Hoy, 2019, available at <https://ri.conicet.gov.ar/handle/11336/89689>

¹⁰ *Informe Litio*, Ministerio de Desarrollo Productivo de la Nación; Secretaría de Minería de la Nación (Oct. 2021), Argentina, page 29.

¹¹ Law Decree 2886, published on November 14, 1979.

Despite some attempts and agreements between the state-owned Yacimientos de Litios Bolivianos (YLB) and foreign operators or investors, Bolivia is not reaching commercial production yet. Political instability has not helped. Currently, Bolivia is still number one in potential resources (21 million tons) but is failing to develop those giant resources into reserves (economically viable).¹²

In contrast, Argentina is moving full throttle to develop its lithium deposits on a rapid schedule. Lithium exploitation is governed by the legal regime applicable to all other minerals, so the legal treatment is different from the Chilean model. However, the federal system of government in Argentina grants control of the resource to the provincial government, and this entails special circumstances to consider, both in the terms and conditions for the use of lithium, as well as in the application of national standards throughout the territory. The Provincial Government of La Rioja approved on December 15 Law 10.608, declaring lithium and its derivatives as strategic natural resources. The Law is not yet been officially promulgated, so it is not yet effectively enforced, but it has sparked debate around its implications.

Argentina currently has only two lithium projects in production: Fénix, operated by the US company Livent, which started production in 1997 in the province of Catamarca; and Olaroz in Jujuy province, controlled and operated by the Australian mining company Allkem. Toyota Tsuho and JEMSE (a provincial state-owned company of Jujuy) are minority shareholders. This project first exported lithium in 2015.

Both projects are expanding their mines to double their production from 20,000 tons each approx. to 40,000 tons in the next few years. In addition to existing operations, the next project is to start commercial production in first quarter of 2023. This project, Cauchari-Olaroz, is also located in Jujuy and operated by Minera Exar (owned by Canadian Lithium Americas and Chinese Jiangxi Ganfeng Lithium with a small participation of the provincial JEMSE). This project is expected to produce 40.000 tons of LCE (Lithium Carbonate Equivalent) in full production.

There are 5 more projects in different stages of development (construction, final piloting, advanced exploration): Mariana, Centenario Ratonos and Salar del Rincón in Salta; Sal de Vida and Tres Quebradas in Catamarca. All of these are expected to start production between 2024 and 2027, and could take the total Argentine production to more than 200,000 tons per year. Rights in the Salar del Hombre Muerto have just been granted to Alpha Minerals.

Many other prospects are in exploration phase, as the region and the price boom continue to attract investors, from local Argentine oil & gas companies (state owned YPF, or Pluspetrol) to giant Chinese or western companies (e.g., major US company with Chilean operations, Albemarle, has announced plans to develop a project in Catamarca, Argentina).

¹² See https://www.wilsoncenter.org/sites/default/files/media/uploads/documents/LAP_201002_vasquez%20brief_update_v1b%5B1%5D.pdf

ENVIRONMENTAL AND SOCIAL IMPACT OF LITHIUM DEVELOPMENT IN ARGENTINA

The extraction of lithium has a range of possible environmental impacts. Reducing CO₂ emissions by transitioning to electric vehicles powered by lithium-ion batteries is an important global goal. But in comparison to the size of the coming private (and public) investment in the sector there has been very little invested in analyzing the social and environmental impacts of lithium extraction. It should be a high priority to increase the knowledge base.

The extraction of lithium from brine deposits, like those in Argentina, requires enormous volumes of water (an estimated 2 million liters of water for each ton of extracted lithium). This has great potential to disturb the hydrologic balance in producing regions, which are generally extremely water short. It may potentially affect freshwater reserves and the delicate balance between fresh and saltwater, and may potentially contaminate fresh water¹³ and affect the supporting ecosystems, which are in many cases quite interesting but poorly documented. It can also have major impacts on existing water users. Much of the lithium reserve is in areas where development will impact the interests of indigenous populations, which introduces additional requirements for consultation.

These are exactly the types of concern about impacts that can produce social movements against lithium production, which would have the effect of slowing the development of this resource.

The lithium projects in Argentina are found in three relatively rural, thinly populated provinces in Argentina called Salta, Jujuy, and Catamarca. The total population of this vast landscape is perhaps 2.5 million people; however, the region where the lithium is being developed is in the most rural and isolated parts of these provinces, called “Puna”.

As of 2010, the last available census data, the population of Puna reached a total of 51,765 inhabitants and the rural population represented 41.4% of the territory's population (23.8% of rural households resided in groups and 17.6% were dispersed); high values if compared to the national average (Argentina has 9% of its population living in rural areas in 2010, a value 4.5 times lower than that of Puna). If we compare these records with non-Puna areas of the northwestern provinces, the magnitude is even more striking: in 2010, the rural population reached 13% in Jujuy, 13% in Salta and 22.9% in Catamarca.¹⁴

In the Puna, there is a high proportion of indigenous people or descendants of indigenous peoples (33.6% of the total population, compared to 3.5% in the NOA region). The main indigenous peoples are the Kollas, Diaguita-Calchaquíes, Guaraníes, Omaguacas, Atacamas and Quechuas¹⁵. Under ILO Convention 169, to which Argentina is signatory, they have a right to be consulted about the development of lithium. And increasingly such communities are finding their voice, and being supported by national supreme courts when decisions are taken without proper

¹³ A. A. Porta et al., *El litio, un recurso de valor estratégico para la región*, Universidad Nacional de La Plata (UNLP) (2020), available at <http://sedici.unlp.edu.ar/handle/10915/121515>.

¹⁴ Longhi, Fernando; Julieta Krapovickas. *Población y pobreza en la Puna argentina en los inicios del siglo XXI*. 2018.

¹⁵ Supra, page 5.

consultation. They are also being supported by numerous decisions of the Inter American Court of Human Rights. As a party to the Pact of San Jose, Argentina is subject to this Court's decisions. See, for example, *Indigenous Communities Members of the Lhaka Honhat Association vs. Argentina* (2020).

There are numerous instances, many of them familiar to our organization and research team, in which perceived inequities in where adverse impacts fall, and where benefits are received, have caused social resistance to mining development, with the effect of slowing or stopping mineral development. Thus, in addition to concerns about basic fairness, there is the practical reality that heavy handed attempts to increase lithium supply may be counterproductive, and create a social backlash that slows, rather than accelerates lithium production.

THE LEGAL SYSTEM IN ARGENTINA

Argentina has a federal system of government. The role for the national government to regulate the lithium boom is quite limited, as the mineral resources are owned by the provinces and, thus, provincial governments are responsible for granting concessions, approving or rejecting projects, evaluating and controlling the environmental and social impact, etcetera. The national government is responsible for macroeconomic conditions and the administration of the Mining Investment Regime, a national law focused on the tax regime for mining investments.

The fundamental responsibility for dealing with environmental impacts of this rapid development falls on the provincial authorities of Salta, Jujuy, and Catamarca Provinces. The same is generally true for the management of the social impacts of the boom. The needs for housing, education, and health services originating in a globally driven boom are falling on local and provincial authorities. There are reasons to be concerned about the level to which local authorities are prepared to deal with this mining boom, or the legal and policy framework is ready to manage it effectively. Such booms often impact availability of housing or cause dramatic escalation in prices of staple food commodities. They also may interfere with traditional subsistence activities. People, often poor people, on whom these impacts fall, and who are not seeing benefits from mineral development, are sometimes the people who get engaged in social movements against mining.

National government is getting the majority of revenues from mining activity, while provincial royalties are capped by law. This distribution pushed the provinces to create different mechanisms as to increase collection and the increased prices is now creating more pressure around the lithium boom.

The problem is compounded by the fact the authority is divided among these provincial governments. It is hard for any one province to have all of the technically capable experts and resources needed to do an adequate job of regulation or oversight. The three provinces have recently celebrated an agreement creating the "Lithium Mining Region", to develop common

approaches, but its effectiveness in a system with a long history of autonomy of provincial governors, is unproven. It needs careful analysis if it is to fulfill its potential.

The problem is enormously multiplied by the “boom” environment. Capable specialists are in great demand in the private sector, and the provincial governments can come nowhere close to offering competitive salaries. There is constant turnover, and there are constant vacancies. Government is having a very hard time functioning effectively in this environment.

TRANSPARENCY

Enormous flows of funds are coming into these provinces in private investments. This region, like others in Argentina and around the world, is not without past instances of misappropriation and misuse of funds.

And the current “boom town” atmosphere is not conducive to carefully thought-out plans, accountability, or checks and balances or to the ultimate goal of transparency of inflows and outflows of funds. These are all necessary elements of effective natural resource governance.

It is very important to act now to assess the legal and policy framework for transparency in the management of funds in the three provinces, and in the principal relevant sub units. Argentine provinces are divided for administration purposes into departments and municipalities, and to the extent these are going to be major administrators of funds derived from lithium development, at least the principal sub units should be examined. Of course, to the extent national government is managing funds, its activities also need to be included.

As an example, we can mention the case of the Alubrera project in Catamarca, that was a major copper project in this same region, which was the first and principal large-scale project developed under new Argentine mining laws and institutions. While IFC did not directly back this major copper development, Alubrera was in some sense the “jewel in the crown” of IFC’s effort to build a legal and regulatory structure capable of attracting large scale foreign mining investment to Argentina.

In the opinion of most Argentines, after 20 years of production there is no substantive improvement in the quality of life of the inhabitants of Catamarca. The funds flowing into the province were considerable, so transparency and efficiency in the use of those funds is at the center of the concerns.

In general, Alubrera was from the government side managed by the authorities of Catamarca Province and neighboring provinces, and the result has its lights and shadows. Institutionally, it looks very much like the “lithium rush.”

SDSG OBJECTIVES AND RESEARCH

Sustainable Development Strategies Group (SDSG) has brought together an interdisciplinary team of professionals, led by experts from Argentina, Peru and North America, to further our research on the Argentinian provinces of Jujuy, Salta and Catamarca. We want to understand the impacts that are currently occurring at the local level to meet the soaring global demand for lithium. We aim to start understanding what measures may be needed to protect the environment and the rights of affected communities, to keep them from harm, and find ways they can share as partners in the benefits of this development.

SDSG and its principals have decades of experience in researching, understanding, and grappling with these kinds of issues. SDSG specializes in research, understanding and capacity building related to key problems in mining minerals and sustainable development. SDSG has worked for governments, international institutions, community advocates and companies - a wide range of the affected interests - around the world to enable sustainable resource development that aligns with the economic and social objectives of local communities, respects their human rights, and protects the surrounding natural environment. SDSG's work covers the range of tasks involved, from research of the applicable regulatory and economic framework, to consulting with affected local communities, to understanding the environmental and technical issues, to negotiating Development Agreements.

ADDITIONAL INFORMATION

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