China's Flexible and Sustainable Approach to Engagement in the Lithium Triangle

Jiaquan Zhou
Master's student, International Relations Department, Tsinghua University & School of Advanced International Studies, Johns Hopkins University

Abstract
China's foray into the Lithium Triangle showcases an adaptive approach to securing essential lithium resources for its lithium battery and electric vehicle (EV) markets. Despite holding a significant share of global lithium battery production, China's reliance on lithium imports highlights its vulnerability. It propels China to adopt an adaptive and robust strategy in the Lithium Triangle, home to nearly 60% of the world's lithium reserves. China's investment strategies are tailored to the distinct policy environments and economic contexts of each country within the triangle. In Argentina, China engages through acquisitions and equity stakes. In Chile, China forms technological partnerships aligned with national interests. In Bolivia, Chinese companies introduce capital and technology and tap into its emerging lithium sector. This approach not only ensures China's lithium supply but also promotes regional development, reflecting China's adaptive strategy in the global energy transition.

Introduction

Energy security constitutes a key component of national security. Lithium, a critical mineral, is increasingly becoming a cornerstone in the ongoing global transition towards sustainable energy. The strategic importance of lithium is underscored by its role in the production of lithium-ion batteries. Compared with traditional battery technologies, lithium-ion batteries offer higher energy density and longer lifespan. Therefore, lithium-ion batteries serve as the essential components of mobile devices, electric vehicles, and energy storage solutions. The functionality of lithium-ion batteries plays an indispensable role in facilitating the global transition to green energy that is highly valued by nations worldwide. Thereupon, the surging demand for lithium-ion batteries has placed lithium at the forefront of national energy policy for nations.

Lithium resources play a significant role in the EV industry and allocation of global value chains. China is the largest global producer of lithium batteries and a leading player of the EV market. China houses six of the world's top ten largest battery makers. As of 2022, China boasted a battery production capacity exceeding that of the entire world combined. China's battery production capacity accounted for approximately 77% of the global in total, which is nearly 900 gigawatt-hours.① Furthermore, China contributed 64% to the global volume of electric vehicle production and 59% of global EV sales.② The dominance in the lithium-ion battery and EV industry positions China as a critical player in the global renewable energy transition. The control China exercises over a significant portion of the lithium battery market not only drives its domestic economic growth and secures its energy security but also produces a ripple effect on the global supply chain.

Despite its robust standing in both battery production and the EV industry, China still faces challenges in securing lithium resources. China heavily relies on imports, for example, in 2022 these accounted for about two-thirds of its lithium resources.③ The overreliance hints at the potential vulnerability of China in its industrial supply chain and underscores the urgent necessity for Beijing to develop a comprehensive strategy to secure lithium sourcing. Therefore, China has expanded and maintained its strong footprint in the resource-abundant regions, particularly in the "Lithium Triangle" of South America; composed of Argentina, Chile, and Bolivia, the Triangle is well-known for holding nearly 60% of the world's lithium resources.④ With advantageous mining conditions and resources, the Lithium Triangle has become a significant component of China's global lithium strategy. Given the divergent lithium policies in Argentina, Chile, and Bolivia, China has carried out an adaptive approach to strengthen its position in the global energy transition and to secure a solid foothold in the critical raw materials market. Consequently, China's active investments in the Lithium Triangle go beyond resource predation, dedicated to promote regional development through substantial investments in infrastructure that align with economic interest and social progression in the region.

---

① Govind Bhutada, "Visualizing China's Dominance in Battery Manufacturing (2022-2027P)," *Visual Capitalist*, January 19, 2023, https://www.visualcapitalist.com/chinas-dominance-in-battery-manufacturing/.
② "Demand for Electric Cars Is Booming, with Sales Expected to Leap 35% This Year After a Record-Breaking 2022," *IEA*, April 26, 2023, https://www.iea.org/news/demand-for-electric-cars-is-booming-with-sales-expected-to-leap-35-this-year-after-a-record-breaking-2022.
③ "China Expected to Increase Control Over Global Lithium and Cobalt Supply," *Institute for Energy Research*, March 22, 2023, https://www.instituteforenergyresearch.org/international-issues/china-expected-to-increase-control-over-global-lithium-and-cobalt-supply/.
④ Scott B. MacDonald, "A New Age for South America's Lithium Triangle?" *Global Americans*, December 22, 2022, https://theglobalamericans.org/2022/12/a-new-age-for-south-americas-lithium-triangle/.

Comparative Analysis of Policies in the Lithium Triangle and China's Strategies

Lithium extraction has traditionally been concentrated in Chile and Argentina, while Bolivia is also joining the development of the lithium industry in recent years. The trade volume in lithium carbonate exports from the Lithium Triangle, especially for Chile and Argentina, to China shows a significant increase as evidenced in Figure 1 and Figure 2. For instance, Chile's lithium exports to China surged from 95 million in 2019 to 6,022 million in 2022. To put it in perspective, in 2022 Chile's lithium resource exports to China constituted nearly 70% of its total exports worldwide. Argentina also saw a significant increase, with exports to China reaching 289 million in 2022, constituting roughly 42% of its global lithium exports.[①] Furthermore, Bolivia is actively seeking foreign investment to advance its lithium industry despite political challenges.[②] Bolivia has been engaging in partnerships, especially with China, to improve its production capacity and technology for lithium extraction, aiming to become a key supplier of lithium and surpass the production levels of its counterparts in Lithium Triangle. In sum, this trend demonstrates the deepening of trade relations and the growing influence of China as a primary market for lithium resources from the Lithium Triangle region.

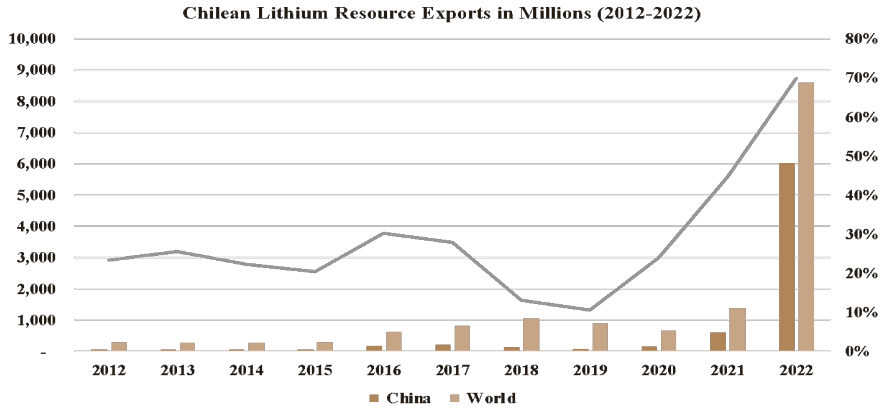

Figure 1 (Source: Chile Customs Data)

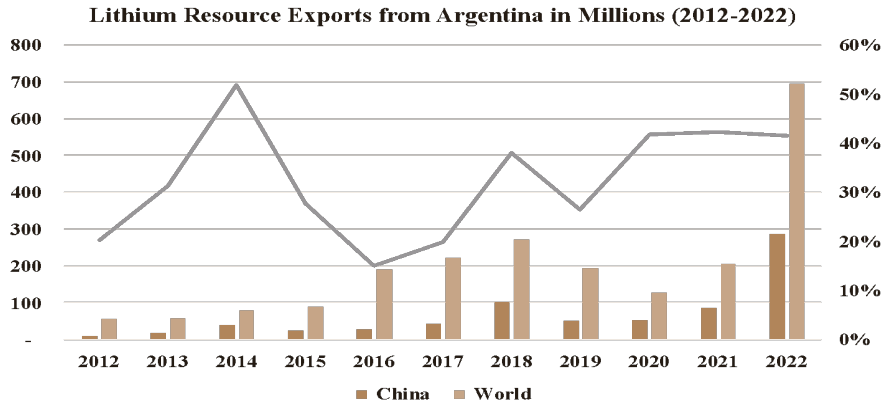

Figure 2 (Source: Argentina Customs Data)

[①] Delgado, Juan. "Chinese Investors Vie for Lithium Mines in Argentina." Diálogo Americas. November 9, 2021. https://dialogo-americas.com/articles/chinese-investors-vie-for-lithium-mines-in-argentina/.

[②] Fernando Molina, "Bolivia Signs Agreements with a Chinese and a Russian Company to Extract Lithium from Its Salt Flats," *El País*, July 1, 2023, https://english.elpais.com/international/2023-07-01/bolivia-signs-agreements-with-a-chinese-and-a-russian-company-to-extract-lithium-from-its-salt-flats.html.

While the Lithium Triangle is known for having abundant lithium resources, mining policies are quite different among Argentina, Chile, and Bolivia. Accordingly, China has adopted an adaptive and sustainable approach that tailors to the varying policies and economic environments of each country.

In Argentina, the government has adopted a decentralized approach to manage the mining sector. The mining jurisdiction and policy setting are being decentralized to the provinces in Argentina, which have the power to grant exploration permits and concessions to private enterprises and collect mining royalties.[①] Therefore, this decentralized approach enables each province to make and revise mining policies tailored to its own circumstances. Province-level government typically collects royalties that are capped at 3% of the market value of the extracted minerals, as per the Mining Investment Law No. 24,196. Under this circumstance, Chinese companies entered the Argentinean lithium market primarily through acquisitions and equity participation. For instance, Ganfeng Lithium Co., the largest Chinese lithium compounds producer, plans to acquire Argentinean private firm Lithea Inc., which owns the rights to lithium salt lakes in Argentina's mineral-rich Salta province and is expected to have an annual capacity of 30,000 tons of lithium carbonate.[②] Additionally, Ganfeng has a stake in the Cauchari-Olaroz project and aims to produce 40,000 tons of lithium carbonate annually. In a similar vein, one of the largest Chinese copper and gold producers, Zijing Mining company acquired in full Neo Lithium Corp., which exploits lithium in Tres Quebradas in the Argentine province of Catamarca. [③] In sum, the growing presence of Chinese enterprises in Argentina's lithium industry aligns with the country's strategy to boost its lithium production. As Argentina decentralized power to the province level in the mining sector, Chinese enterprises tend to enter the market through acquisitions and equity participation.

Unlike the decentralized approach carried out by Argentina, lithium concessions will not be granted to foreign firms in Chile. The Chilean government views lithium as an integral part of national construction and economic development, further emphasizing the "public-private partnership" model in the development of lithium resources.[④] This approach allows private enterprises to hold control over non-strategic projects while the government retains majority ownership of projects that are being considered as strategically significant. Moreover, State-owned enterprises in Chile play a major role in the entire extraction of lithium resources, whereas private or foreign enterprises, through the model of "public-private partnership", take the responsibility of contributing knowledge, expertise, and capital. Therefore, this model allows for private enterprise participation while maintaining the government's significant influence or ownership in lithium projects. Chinese enterprises adopt an adaptive approach to align with Chile's grand strategy in the lithium industry. For instance, Chinese company Tianqi Lithium, already holding a 22.16% stake in Chilean chemical company SQM, seeks to increase its participation in Chilean lithium

[①] Javier Lewkowicz, "Argentina Wants to Triple Its Mining Exports, Amid Social Conflicts," *Diálogo Chino*, January 6, 2022, https://dialogochino.net/en/extractive-industries/50042-argentina-triple-mining-exports-social-conflicts/.

[②] Julieta Pelcastre, "Chinese Lithium Giant Expands Operations in Argentina," *Diálogo Americas,* August 19, 2022, https://dialogo-americas.com/articles/chinese-lithium-giant-expands-operations-in-argentina/ .

[③] Juan Delgado, "Chinese Investors Vie for Lithium Mines in Argentina," *Diálogo Americas*, November 9, 2021, https://dialogo-americas.com/articles/chinese-investors-vie-for-lithium-mines-in-argentina/.

[④] Government of Chile, "National Lithium Strategy for Chile and its People," accessed January 7th 2024, https://www.gob.cl/litioporchile/en/.

extraction by introducing technological innovations in the lithium value chain in Chile.[①] Additionally, Chinese electric car maker BYD is developing a $290 million lithium cathode battery production factory in northern Chile.[②] BYD's initiative is a direct response to Chile's requirements, showcasing how Chinese companies are adapting their strategies to meet the needs of countries accordingly. These investments reflect Chile's intention to align lithium development with national construction and economic development such as providing jobs and adding value to the local community.

Bolivia goes to great lengths to catch up with Argentina and Chile in the development of the lithium industry. The Bolivian government has shown a commitment to developing its lithium resources after years of political turmoil, announcing the start of a bidding process for lithium resource exploitation in 2021.[③] The process witnessed a significant development when CBC formally signed an agreement with Bolivia's state lithium firm YLB in 2023.[④] The CBC is a consortium with 66% shares held by Chinese company CATL and with 34% shares owned by another Chinese company, Luoyang Molybdenum. This deal involves an investment of $1.4 billion for the construction of two lithium salt processing plants. The construction of these plants in the Uyuni and Oruro salt flats in southwest Bolivia was planned to begin in July 2023. In sum, given Bolivia just started attracting foreign investments in lithium resources in recent years, Chinese companies have been actively engaging in market entry and contributing capital, technology, and expertise to the country.

Conclusion

In conclusion, China's strategic engagement in the Lithium Triangle demonstrates its adaptive approach tailored to the diverse policies and economic environments of the Lithium Triangle. In Argentina, Chinese companies are tapping into the market through acquisitions and equity purchasing in the lithium industry. Conversely, China is establishing factories and transferring technologies in order to comply with regulations in Chile, where the government tries to balance national security with lithium resource extraction. In Bolivia, the current government still positions itself in the early stage of developing lithium resources. Under these circumstances, Chinese companies take advantage of the favorable policy and environment and actively enter the new market. In sum, this underscores China's responsive and adaptive approach to foreign direct investment.

[①] Fundación Andrés Bello, "China Tianqi Seeks to Increase Its Participation in Chilean Lithium Exploitation," September 26, 2023, https://fundacionandresbello.org/en/news/chile-%F0%9F%87%A8%F0%9F%87%B1-news/china-tianqi-seeks-to-increase-its-participation-in-chilean-lithium-exploitation/.

[②] Ali Rahman and Leland Lazarus, "The China-West Lithium Tango in South America," *The Diplomat*, October 23, 2023, https://thediplomat.com/2023/10/the-china-west-lithium-tango-in-south-america/.

[③] Daniel Ramos, "Bolivia Taps China, Russia's Rosatom in Bid to Unlock Huge Lithium Riches," *Reuters*, June 30, 2023, https://www.reuters.com/world/americas/bolivia-seals-14-bln-lithium-deals-with-russias-rosatom-chinas-guoan-2023-06-29/.

[④] Fernando Molina, "Bolivia Signs Agreements with a Chinese and a Russian Company to Extract Lithium from Its Salt Flats," *El País*, July 1, 2023, https://english.elpais.com/international/2023-07-01/bolivia-signs-agreements-with-a-chinese-and-a-russian-company-to-extract-lithium-from-its-salt-flats.html.

Bibliography

Bhutada, Govind. "Visualizing China's Dominance in Battery Manufacturing (2022-2027P)." *Visual Capitalist*. January 19, 2023. https://www.visualcapitalist.com/chinas-dominance-in-battery-manufacturing/.

"China Expected to Increase Control Over Global Lithium and Cobalt Supply." *Institute for Energy Research*. March 22, 2023. https://www.instituteforenergyresearch.org/international-issues/china-expected-to-increase-control-over-global-lithium-and-cobalt-supply/.

"Demand for Electric Cars Is Booming, with Sales Expected to Leap 35% This Year After a Record-Breaking 2022." *IEA*. April 26, 2023. https://www.iea.org/news/demand-for-electric-cars-is-booming-with-sales-expected-to-leap-35-this-year-after-a-record-breaking-2022.

Delgado, Juan. "Chinese Investors Vie for Lithium Mines in Argentina." *Diálogo Americas*. November 9, 2021. https://dialogo-americas.com/articles/chinese-investors-vie-for-lithium-mines-in-argentina/.

Fundación Andrés Bello. "China Tianqi Seeks to Increase Its Participation in Chilean Lithium Exploitation." September 26, 2023. https://fundacionandresbello.org/en/news/chile-%F0%9F%87%A8%F0%9F%87%B1news/china-tianqi-seeks-to-increase-its-participation-in-chilean-lithium-exploitation/.

Government of Chile. "National Lithium Strategy for Chile and its People." Accessed January 7th, 2024. https://www.gob.cl/litioporchile/en/.

Lewkowicz, Javier. "Argentina Wants to Triple Its Mining Exports, Amid Social Conflicts." *Diálogo Chino*. January 6, 2022. https://dialogochino.net/en/extractive-industries/50042-argentina-triple-mining-exports-social-conflicts/.

MacDonald, Scott B. "A New Age for South America's Lithium Triangle?" *Global Americans*. December 22, 2022. https://theglobalamericans.org/2022/12/a-new-age-for-south-americas-lithium-triangle/.

Molina, Fernando. "Bolivia Signs Agreements with a Chinese and a Russian Company to Extract Lithium from Its Salt Flats." *El País*. July 1, 2023. https://english.elpais.com/international/2023-07-01/bolivia-signs-agreements-with-a-chinese-and-a-russian-company-to-extract-lithium-from-its-salt-flats.html.

Molina, Fernando. "Bolivia Signs Agreements with a Chinese and a Russian Company to Extract Lithium from Its Salt Flats." *El País*. July 1, 2023. https://english.elpais.com/international/2023-07-01/bolivia-signs-agreements-with-a-chinese-and-a-russian-company-to-extract-lithium-from-its-salt-flats.html.

Pelcastre, Julieta. "Chinese Lithium Giant Expands Operations in Argentina." *Diálogo Americas*. August 19, 2022. https://dialogo-americas.com/articles/chinese-lithium-giant-expands-operations-in-argentina/.

Rahman, Ali, and Leland Lazarus. "The China-West Lithium Tango in South America." *The Diplomat*. October 23, 2023. https://thediplomat.com/2023/10/the-china-west-lithium-tango-in-south-america/.

Ramos, Daniel. "Bolivia Taps China, Russia's Rosatom in Bid to Unlock Huge Lithium Riches." *Reuters*. June 30, 2023. https://www.reuters.com/world/americas/bolivia-seals-14-bln-lithium-deals-with-russias-rosatom-chinas-guoan-2023-06-29/.