

A Democracy Center Special Report

Bolivia and its Lithium

Can the “Gold of the 21st Century” Help Lift a Nation out of Poverty?



Rebecca Hollender
Jim Shultz

May 2010

Executive Summary

The resource curse refers to the paradox that countries and regions with an abundance of natural resources, especially minerals and fuels, tend to have less economic growth and worse development outcomes than countries with fewer natural resources.

Bolivia has a long history with that curse, dating back to the theft of its silver at the hands of the Spanish during the colonial era. Today Bolivia seeks to break that curse with what some call “the gold of the 21st century”: lithium. This report examines Bolivia’s prospects for doing so.

I. Lithium – The Super Hero of Metals

Every time we pick up a cell phone or iPod, look at our watch, or plug-in a laptop we are relying on batteries that contain lithium. It is also used in ceramics and glass production, bi-polar medication, air conditioners, lubricants, nuclear weaponry, and other products. The lightest metal on Earth,

lithium is mined from many sources, but most cheaply from underground brines like those found in abundance under Bolivia's vast Salar de Uyuni.

Today the global focus on lithium is about its potential as a key ingredient in a new generation of electric cars batteries. Powerful global players are investing billions of dollars in lithium's future. Some predictions speculate that lithium car battery sales could jump from \$100 million per year to \$103 billion per year in the next 2 decades. If so, the countries that possess lithium are poised to become much bigger players in the global economy.

Despite the growing enthusiasm about lithium's future, there are also real doubts as well. The process for transforming lithium into its commercially valuable form, lithium carbonate, is complex and expensive. The electric vehicle batteries currently being developed with lithium are still too large and heavy, and too slow to charge. The batteries are so expensive that they put the cost of electric cars beyond the reach of most consumers. Lithium batteries also have a record of catching fire. So while lithium car batteries might become a massive global market, they could also turn out to be the energy equivalent of the 8-track tape.

II. The Race for Bolivia's Lithium

Based even on conservative estimates, Bolivia's lithium reserves are the largest in the world. The Salar de Uyuni, a 10,000 square kilometer (3,860 square miles) expanse of salt-embedded minerals, located in Bolivia's department of Southwest Potosí, is ground zero for Bolivia's lithium dreams.

Foreign corporations and governments alike are lining up to court a Bolivian government intent on getting the best deal possible for its people. Among the major players are two Japanese giants, Mitsubishi and Sumitomo, the latter of which already has a stake in the controversial San Cristobal Mine known for contaminating the same region. The French electric vehicle manufacturer, Bolloré, is also courting the Morales government, as are the governments of South Korea, Brazil, and Iran.

The Bolivian government has sketched out a general plan for the various phases of its lithium ambitions, but many of the details of how all this will be done have yet to be defined. To get its feet wet in the technical and economic waters of lithium, the government of Bolivia has invested \$5.7 million in the development of a "pilot plant" at the edge of the Salar de Uyuni. The plant is intended to test drive the steps in getting the lithium-rich brine out from under the Salar's crust and separating it into its distinct (and marketable) parts. Based on the experience of this pilot plant, the government aims to then construct a much larger industrial-scale plant, capable of producing up to 30,000 to 40,000 metric tons of lithium carbonate per year. This will be followed by a third phase to produce marketable lithium compounds, which the government plans to undertake in partnership with foreign investors.

To get help in meeting the formidable challenges it faces, the government has assembled a Scientific Advisory Committee (Scientific Research Committee for the Industrialization of the Evaporitic Resources of Bolivia) comprised of experts from universities, private companies, and governments, to give free, and mutually beneficial, advice.

III. The Challenges Ahead on Bolivia's Lithium Highway

At heart, Bolivia's lithium ambitions are simple: to lift a people out of poverty by squeezing the maximum benefit possible from a natural resource on the cutting edge of global markets. But between

where Bolivia sits today and where it aims to go on its lithium highway there are major challenges that it will need to face:

Getting the Economics Right

Bolivia's dreams of lithium wealth involve hitting a complicated moving target. The electric car battery market looks like the most lucrative for lithium development, and is the one the Morales government says it's aiming for (Morales also claims that Bolivia will produce electric vehicles), but how big that market will be, and when it will peak, is still just a guessing game. Bolivia could aim for more traditional lithium markets, such as glass and ceramics, but they aren't nearly so potentially profitable. A middle option would be established types of lithium batteries for products such as watches, cell phones, iPods, laptops and other electronic gadgets.

How much will it cost to build a lithium battery industry in Bolivia? That number is one of the most elusive pieces of information in the picture. If Bolivia kicks into full industrial mode the budget would be \$200 million or higher just for the main plant. But that still doesn't include massive additional investments in supporting chemical industries and huge infrastructure development in a region where today even keeping the lights on is a technological challenge. One Bolivian official has placed the potential cost at as high as \$1 billion. Because of this, Bolivia is looking for serious partnerships with investors, an approach that some local community groups do not support.

The fact that the government might suddenly have substantial new revenues from lithium is also no guarantee that the Bolivian people will end up any better off. Those revenues could easily become a magnet for corruption, waste and favoritism and there will be a constant tension between the demand to use the funds for public goods and reinvesting them into state-controlled lithium production.

Environmental Impacts

Lost in the great Bolivian lithium race is a set of very deep and real environmental concerns. In the name of providing cleaner cars to the wealthy countries of the north, Bolivia's beautiful and rare Salar could end up an environmental wasteland. The adequacy of Bolivia's environmental strategy for lithium development in Southwest Potosí is doubted by several well-regarded Bolivian environmental organizations.

One major problem that lithium development could cause is a major water crisis. The region already suffers from a serious water shortage, impacting quinoa farmers, llama herders, the region's vital tourism industry, and drinking water sources. While Bolivian officials contend that the lithium project's water requirements will be minimal, their estimates are based on very limited and incomplete information.

Contamination of the air, water and soil is also a major concern. Large quantities of toxic chemicals will be needed to process the predicted 30,000 to 40,000 tons of lithium per year that the project expects to mine. The escape of such chemicals via leaching, spills, or air emissions is a danger that threatens the communities and the ecosystem as a whole. Reports from Chile's Salar de Atacama describe a landscape scarred by mountains of discarded salt and huge canals filled with blue chemically contaminated water.

Bolivian officials have dismissed those risks, and the government system in place to protect the environment is inadequate at best. Public institutions, such as Bolivia's Ministry of the Environment

and Water, which are responsible for ensuring compliance with environmental requirements, clearly lack the capacity or authority to intervene in an effective way.

The Threat to Communities

How do the people and communities who live in Southwest Potosi feel about their homeland becoming the site of what could soon become one of the biggest industrial projects their nation has ever built? To be sure, many groups in the region have long supported lithium development, seeing it as a vital opportunity for increased income and development. But there are deep concerns as well.

Quinoa producers and tourism operators have expressed concern about supposed benefits that the Bolivian government has promised from lithium, saying that the benefits are irrelevant to local needs and could easily damage the two industries that are thriving in the region – agriculture and tourism. But Bolivia’s laws that guarantee community involvement in planning are as weak as its environmental protections. While some local organizations--especially ones that actively support Evo Morales’ political party (MAS)-have been engaged, others say they have not.

The Capacity of the Bolivian Government to Manage the Program

Finally, there are concerns about the chronic problems faced by the Bolivian government to manage such an ambitious program – problems that pre-date President Morales. To pull off its lithium ambitions, Bolivia will need highly trained and qualified experts, in the technical and scientific aspects of lithium, in business management and economics, and in social and environmental impacts. And these experts need to be solely accountable to the Bolivian people, not to foreign governments or corporations.

IV. Conclusion - Can Bolivia Beat the Resource Curse?

Whether these challenges are surmountable for the people of Bolivia and their leaders is an open debate. To be certain, there is real potential here. The demand for lithium is clearly on the rise, and with the possibility in the future of a very big rise. Bolivia is indeed sitting on the world’s largest supply of lithium and it is being courted by some serious players. And importantly, all this is happening just as Bolivia has a government that has committed itself to a different way of doing resource business.

In practical terms, the government is also doing some important things right, such as beginning with a pilot effort to test the technological and economic waters. But there are many things that can go badly wrong on the lithium road ahead. In the uphill battle to make Bolivia’s lithium dreams a reality, clearly the first step is to acknowledge and understand the economic, environmental, social, and capacity challenges.

What Bolivia is trying to do is hard – very hard. It is trying to break a curse – the paradox of plenty – that few impoverished nations escape. Its effort to escape that curse is extremely important, which is why so much of the world is watching. It is an experiment that is economic, social, political, technological and practical all at the same time. The fate of its success lies in the hands of the Bolivian people and in their ability to hold their leaders accountable, both for their own benefit and the planet’s.

Full version available at: www.democracyctr.org