



**Sustainable Development
Strategies Group**

**REPORT: CURRENT ISSUES IN THE CHILEAN MINING
SECTOR**

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Limitations

In the limited time available for this report, there has not been time for in depth original research, and we have had to rely principally on views of professional contacts in Chile to orient the work. The purpose of this report is a brief survey of current and anticipated issues in the mining sector in Chile. It is not an in depth treatment of the subject, and undoubtedly there are issues of importance not dealt with adequately, or at all.

This report has benefited from contributions from or review by Marketa Zubkova, Luke Danielson, and Patricia Nelson. Final responsibility for its contents rests with its lead author, Marketa Zubkova, and the Sustainable Development Strategies Group.

CURRENT MINING ISSUES IN CHILE

Introduction to the Mining Sector

- 1. Sector Governance.** We set out a brief introduction to the principal governance bodies.
- 2. Royalties.** We briefly describe the Chilean royalty system.
- 3. Socioeconomic Conflicts.** Chile has several clear conflicts relating to mineral development; competition for energy and water are at the center of many of them. Public social movements expressing concern about large scale resource development are clearly increasing. The role of public participation is at the center of the Chilean debate.
- 4. Environmental Issues.** There are a number of major environmental issues related to mining and minerals in Chile. Water, energy, biodiversity and air quality are among the most important. These are forcing a new generation of environmental laws and regulations and a revamping of the institutions that manage Chile's environmental policies, as described in detail in Section 10 below.
- 5. Water in the Atacama Desert.** Northern Chile is one of the world's most important mining regions. But increasing scarcity of water limits mineral development and creates competition for water with traditional communities and ecological needs, and drives costly solutions.
- 6. Energy.** Because most of Chile's electricity comes from hydropower, water shortage equals energy shortage. The lack of a secure, dependable supply of reasonably priced energy is another limit on mineral development. Energy is another area where the demands of mining are competing with other needs.
- 7. Public Participation.** Chile is a country that in recent decades has had a relatively quiescent citizen voice in natural resource development. But several recent cases, notably the citizen protests against the Pascua Lama gold project, make it clear that civil society is gaining its voice. The country is grappling with how to deal with citizen activism and public participation, and the appropriate role for citizen involvement in decision making.
- 8. Mine Safety.** Mine safety is never good enough. But the record of the large nationally and internationally owned mines in recent years has been good by world standards. This has not been the case with the small mines sector, but the country has not made enforcement of safety standards a priority in this sector for fear of losing jobs. The current incident at the San Jose mine will change that.
- 9. Indigenous Rights.** Chile recently ratified ILO Convention 169. The question is whether this is simply a symbolic gesture, or whether it creates a right of free prior informed consent for indigenous peoples that is enforceable under national law. If it does create rights, what are they?

10. Environmental Institutions –Chile had few significantly developed environmental institutions in the Pinochet years. Starting in the early 1990s, the country developed a set of meaningful but limited framework laws. There has been a lack of enforcement and monitoring of environmental laws.

But the growing demands on this system, higher public expectations, Chilean accession to the OECD and other factors are leading to a dramatic set of changes in the country's environmental institutionality. CONAMA is becoming a Ministry of Environment with much greater power. Maximum fines are being dramatically increased, and stronger enforcement seems to be arriving. The country is discussing the creation of specialized environmental courts. This will create a higher bar of environmental performance for the Chilean mineral industry.

Introduction: A Portrait of Chile's Mining Sector

Chile is one of the most important mining companies in the world. Though it has only 16 million people, Chile attracted more than US\$18 billion in mining investment from 1974 to 2003.¹ Projected mining investment from 2009 to 2013 is US\$30 billion.² "*Chile es un país minero,*" say Chileans: "Chile is a mining country."

Chile is the world's leading copper producer, with copper accounting for 56% of Chile's \$59 billion in total exports in 2006.³ But Chile is also a major producer of gold, silver, coal and iron. Mining is perhaps the principal pillar of the Chilean economy.

In sort, there is tremendous profit potential for private investors, considerable economic growth potential for Chile, and considerable potential tax revenues for the Chilean state in accelerated mineral development. The limitations on developing these resources are not availability of minerals but scarcity of water, scarcity of affordable energy, the rights of indigenous people, and the willingness of the public to tolerate the impacts of this kind of development.

In the minds of most Chileans, mining has played an important role in the country's growth from a \$3000 USD per capita GDP to nearly \$15,000 today.⁴ And as so often in mineral rich states, the average citizen is less concerned with the inequality of distribution than the prospect of increased prosperity.

¹ Elizabeth Bastida, Ricardo Irarrázabal and Ricardo Labó, *Mining Investment and Policy Developments: Argentina, Chile and Peru* (citing Chilean Copper Commission, 2003). An earlier version of this paper was presented at the Annual Mining Seminar, Centre for Energy, Petroleum and Mineral Law & Policy, University of Dundee, held in the Natural History Museum, London, 21st June 2005. Available at http://www.dundee.ac.uk/cepmlp/journal/html/Vol16/Vol16_10.pdf.

² Chilean Copper Commission, *Investment in the Chilean Copper and Gold Mining Sector Estimations for 2009-2013, Revised to March 2009 DE/02/2009* (March 2009), http://www.cochilco.cl/english/productos/pdf/Copper_and_gold_mining.pdf.

³ Eduardo Titelman, *Mining Investment and Mining Business in Chile*, CoChilco powerpoint presentation, Tokyo (6 March 2007).

I. Resource Governance

The principal legislation that governs the mining sector in Chile is the Mining Code. Because the right to mine is obtained by compliance with the steps necessary to obtain a mining concession, and the terms of concessions are spelled out in the Code, there are no mining agreements negotiated by the Chilean state.

The principal institutions of relevance include:

The Mining Ministry, which administers the concession system under the code.

CODELCO, the state owned copper company which is the world's largest copper producer and has considerable influence over government policy and priorities;

COCHILCO, the state Copper Commission, which serves as auditor and strategic planner for the state owned copper sector;

SERNAGEOMIN, the national geology and minerals service which performs services such as mine safety inspections, review of mine closure plans and the like;

CONAMA, which has been the national environmental agency (as described elsewhere this is changing) and which promulgates basis environmental requirements, reviews and approves environmental impact evaluations, etc.;

SONAMI, the national mining society, which represents industry interests, including the interests of small and medium nationally owned companies;

Chile has a unitary system of government. While there are regional government administrative centers for the regions, the regional officials are appointed by and responsible to the central government.

As in all countries there are governance problems in the sector in Chile. Chile does, in comparison to many other countries, have a transparent process for allocating mineral revenues, which are the most important source of funding for government activities.

The principal issues have been related to trying to balance the needs of the mining sector with the needs of other entities in Chile: the mining sector is so large and influential that claims of others to energy, water, land and other resources may sometimes not get full attention.

⁴ See IMF data reported at http://www.indexmundi.com/chile/gdp_per_capita_%28ppp%29.html.

2. Royalties

Mining companies currently pay a royalty of between 4 and 5 percent.⁵ The current royalty tax began in 2005 and brought the government more than 570 million USD in 2008.⁶ The mining tax is the only industry-specific tax in Chile and only the president can introduce legislation to change taxes.

Public pressure has been building in Chile to make foreign miners who profit from the country's resources contribute more to rebuilding damage from the earthquake, regional development and investment in health and education. The new royalty would raise several billion dollars more from 2018 through 2025.⁷

The new bill initially sets the royalty at 4 percent to 9 percent on mining sales and raises it to 5 percent to 9 percent starting in 2018. Piñera hopes miners will agree to pay higher royalties amid growing expectations for foreign companies to contribute more to the post-quake rebuilding. "The royalty establishes a minimum rate of 4 percent, which we have today, and so ensures a floor," Piñera said.

"But it allows that when the price of copper is at high levels, as we have seen in recent years and hope it continues to remain so, the state and all Chileans will in a way be partners of the mining industry and we can share these benefits." However, the royalty would have to be voluntary because the country already has contracts with foreign miners that expire around 2017.

Mining executives have expressed concern that a tax increase, particularly a large one, could have a long-term detrimental effect on foreign investments in the industry. Small and medium-sized mining companies expressed particular concern, but both Minister Secretary General Von Baer and Minister of Interior Hinzpeter promised that any change would take their needs into account. Currently government officials are analyzing both the legal and fiscal repercussions of an increase. If an increase were to

⁵ Chile to hike Mining Royalties, Calgary Herald, September 18, 2010, <http://www.calgaryherald.com/news/Chile+hike+mining+royalties/3543599/story.html>,

⁶ Chile considers increasing mining royalty to help earthquake reconstruction. Lindsay Fendt, Santiago Times, March 19, 2010, <http://en.mercopress.com/2010/03/19/chile-considers-increasing-mining-royalty-to-help-earthquake-reconstruction>

⁷ WRAPUP 2-Chile bill ups mine royalty to 5-9 pct from 2018 <http://www.reuters.com/article/idUSN3124143620100831>

happen, the government would likely make it gradual, as the Ricardo Lagos government did when the royalty was first enacted.⁸

Congress rejected President Piñera's first attempt to raise the mining royalty in July. He submitted a revised bill on Aug. 31 and it was passed by the lower house on September 15.

3. Social and Economic Conflicts

As set out in greater detail below, there are several issues of considerable importance:

- Conflicts over use of increasingly scarce water in the North where mining dominates;
- Conflicts over energy supplies; and
- An increasing voice for civil society in general and indigenous communities specifically. Chile once had fairly quiescent social movements, but no more. The Pascua Lama mining protests by affected local communities, and the subsequent protests against the approval of two thermo-electric plants in Punta de Choros, Coquimbo, by Suez Energy Co. mark a dramatic turn, and have called into question the attitude that all major projects will automatically be approved.

4. Environmental Issues.

There are very considerable environmental issues in the Chilean mining sector. These include:

- Conflicts over availability of water to preserve biodiversity in the arid northern regions (see Section 5 below);
- The controversy over damming the major free flowing rivers in the undeveloped wild areas of the South, which is proposed largely because of the demands of mining for electrical energy (see Section 6);
- Public participation in environmental decisions, the rigor of legal provisions and enforcement, and the strength of government environmental institutions, also discussed below; and
- Impact of smelter emissions on air quality, which is an area where some progress has been made but more remains to be done.

5. Water in The Atacama Desert

⁸ Id

The Atacama Desert in the Chilean north is the principal if not the only hub of Chilean mining. It is one of the most important mining regions in the world. It is also one of the world's driest places. There are places in the Atacama with an annual average rainfall of 0.6 mm to 2.1 mm. There are some areas which have never recorded rainfall. Researchers from the Edinburgh University found loose sediment older than 20 million years that would normally be destroyed or washed away by rainfall or running water.⁹

The Atacama is bounded on the east by the cordillera of the Andes. The high Andean peaks do receive snow, and what water exists in the Atacama is in large part the surface or subsurface flow from snowmelt. In some cases, the water from snowmelt moves underground over long periods of time and surfaces in small wet seeps or *bofedales*.

The Atacama is sparsely populated today, with less than one million inhabitants, few of whom live in the central part of the desert. The population is concentrated in the coastal cities, fishing villages, oasis communities and scattered mining camps. In the altiplano, the native Aymara and Atacama Indians herd llamas and alpacas and grow crops with water from snowmelt streams.

The plant and animal life in the Atacama survive under some of the earth's most demanding conditions. There is a high incidence of endemic flora such as *llareta*, a rare native plant that grows one centimeter a year in dense mounds.

Six restricted species can be found in the north region: thick-billed miner, white-throated earthcreeper, cactus canastero, Chilean woodstar, slender-billed finch, and the tamarugo conebill, the latter three of which are considered threatened species. One of the vulnerable species,¹⁰ the Andean Flamingo, lives in the High Andean wetlands. The wetlands are an important source of water and a singularly rich in biological diversity¹¹.

Water in Atacama

Water in the desert is very scarce and it can be found in the following places: salt lakes (very salty water), snow (glaciers), underground, dew and fog. The Atacama gets most of the moisture from a coastal dense fog known as *camanchaca*.¹² A recent innovation has made it possible to catch water from "camanchaca." With the use of mesh nets, water is trapped and carried off via pipes into storage

⁹ Jonathan Amos, *Chile desert's super-dry history*, BBC NEWS, <http://news.bbc.co.uk/2/hi/science/nature/4437153.stm> (last updated 8 December 2005).

¹⁰ Species faces a high risk of extinction in the wild.

¹¹ UNEP/CMS, *Flamenco in the Atacama Desert*, http://www.cms.int/publications/pdf/Flamingos_Brochure_E.pdf.

¹² Priit J. Vesilind, *The Driest Place on Earth*, NATIONAL GEOGRAPHIC (August 2003), <http://ngm.nationalgeographic.com/ngm/0308/feature3/>.

tanks in a village. The fog-catchers supply the village with an average of 2,600 gallons (10,000 liters) of water every day.¹³

Mining in Atacama

The Atacama has an abundance of valuable minerals.¹⁴ In fact, from the discovery of the Chinarcillo silver lode in 1832, minerals became an economic mainstay whose economic importance increased in the 1840s and 1850s, when large deposits of silver and copper ores were discovered in the Norte Chico and Santiago regions of the Atacama. The world's largest body of copper ore can be found in the Atacaman town of Chuquicamata. Moreover, much of the soil in the Atacama is high in nitrates (used to make fertilizers around the world). Until World War I drove the invention of synthetic nitrates, the nitrate industry in the Atacama was one of the richest mining sectors on earth, and some of the northern mining towns were very prosperous. When the British blockade of Europe during the First World War led to development on a nitrate fixing industry in Germany, the Chilean industry declined.¹⁵

There are fairly high concentrations of other salts in the Atacaman soil, such as sulfate, chloride, iodate, and perchlorate.¹⁶ Some of the great lakes are rich in lithium, and the potential demand for lithium for batteries in electric cars is driving increased exploitation of these reserves.¹⁷ Since these are often the same lakes where the Andean flamingoes nest and feed their young on brine shrimp, on islands in shallow water, the potential drying up of these lakes from lithium production is a major potential issue, as it is in Peru and Bolivia.¹⁸

Mining has had an enormous and troubling impact on both ground and surface water resources in the Atacama and the environment of the area. Mining needs a lot of water, which is taken from the groundwater. This threatens to dry out wetlands - the habitats and feeding grounds of Andean Flamingoes and many other species. Mining also has a negative impact on some plants that the local populations have relied on for medical purposes for generations.¹⁹ It has also resulted in

¹³ *Id.*

¹⁴ Robert Albritton, *The Atacama Desert: A Physiographic Dissection of the Hyper-Arid Desert Region of Chile* (25 September 2006, University of Maryland), <http://www.geog.umd.edu/academic/undergrad/AlumniWritingAward/Albrittonpaper.pdf>.

¹⁵ Richard Sicotte, Catalina Vizcarra & Kirsten Wandschneider. *The Chilean Nitrate Industry: External Stocks and Policy Responses 1880-1935* (August 2009).

¹⁶ See Albritton, *supra* note 14.

¹⁷ Jaymi Heimbuch, *Demand for Lithium to Grow, and Chile's Desert Will Be Key Source*, SCIENCE & TECHNOLOGY, TREE HUGGER (11 September 2009), <http://www.treehugger.com/files/2009/09/demand-for-lithium-to-grow-and-chiles-desert-will-be-key-source-video.php>.

¹⁸ Les Line, *Farewell to Flamingoes?*, NATIONAL WILDLIFE (1 December 2003), <http://www.nwf.org/News-and-Magazines/National-Wildlife/Birds/Archives/2004/Farewell-to-Flamingos.aspx>.

¹⁹ *Atacama Desert*, in NEW WORLD ENCYCLOPEDIA, http://www.newworldencyclopedia.org/entry/Atacama_Desert.

transfer of water rights from ancient native villages that have practiced sustainable irrigated agriculture for thousands of years.²⁰

Moreover, mining operations create considerable dust that can be transported long distances by wind. This causes snow on Andean glaciers to melt faster. Farmers in the mountain region rely on the snowmelt water for their livelihood, and they fear that dust emissions will damage nearby glaciers. Experts believe that a covering of as little as 1mm of (heat absorbing) dust could result in glacier shrinkage of up to 15 percent.²¹

Climate change may also reduce the amount of snow, shrink the glaciers, and reduce water supplies.²²

Because there is tremendous pressure for expansion of mining in the Atacama, and the availability of water both for the mining process and for use by mine workers and dependent populations is the limiting factor in the development of some of the world's richest mineral deposits, there is tremendous pressure on the water resource.

On the positive side, competition for water could lead to innovations in water-saving and water-recycling technology. The cost of water in the Atacama is probably high enough to make some advanced technologies competitive.²³

On the troubling side, water scarcity is threatening biological diversity and the future of the traditional native populations of the area. Moreover, the problem is likely to get worse.

Indigenous peoples in northern Chile traditionally managed water sustainably on their arid ancestral lands.²⁴ People have been mining in Chile since at least the time of the Spanish conquest. However, the environmentally destructive impacts mining have come to the fore since the 1980s, driven by the enormous boom in mining and Chile's decision to privatize water. The Chilean Water Code facilitated conversion of agricultural water to large-scale, water-intensive mining development. This type of mining greatly increased the impacts on local water supplies and water-based ecosystems, impacts that may

²⁰ Rutgerd Boelens & Hugo de Vos, *Water Law and Indigenous Rights in the Andes*, CULTURAL SURVIVAL QUARTERLY (Winter 2005), <http://www.culturalsurvival.org/publications/cultural-survival-quarterly/bolivia/water-law-and-indigenous-rights-andes>.

²¹ James Fowler, *Government Study: Pascua Lama Threatens Glaciers*, SANTIAGO TIMES (7 January 2010), *republished at Mines and Communities*, <http://www.minesandcommunities.org/article.php?a=9800>.

²² Daniela Estrada, *Scientist Warns of Threats to Rock Glaciers*, INTER PRESS SERVICE (IPS) (24 April 2009), <http://ipsnews.net/news.asp?idnews=46619>.

²³ If water is being produced by using imported natural gas to run desalination plants, and then pumped inland to an altitude of 3000 meters where the mines are, it is very expensive water.

²⁴ See, e.g., Ms. Maria Angelica Alegria, steering committee GWA, Chile, *Indigenous Women and Andean Wetlands Protection Protection and Tourist Exploitation – Chil[e]*, Bottom Up Meets top Down : Learning lessons from Latin America and Africa, World Water Council, World Water Forum (Mexico 2006), <http://www.worldwatercouncil.org/index.php?id=1227&0=>.

not be immediately apparent and that may continue to alter the underground hydrology even after pumping stops.²⁵

For example, the Cerro Colorado copper mining project pumped 125 liters of water per second out of a protected wetland between 1994 and 2002. When the local indigenous peoples complained that their wetlands were drying out, the company suggested that the dropping water levels were a natural phenomenon unconnected to their pumping activities. In 2005, Chile's Directorate General of Water concluded that the mining project caused the problem. The wetlands had dried up because the project pumped water from the hydrological system that fed them.²⁶

Underlying Legal Issue

A major source of the water scarcity problem lies in Chile's constitution. In 1980, the Pinochet regime pushed through a constitutional amendment that classified Chile's water as a privately traded commodity. Chile's water market approach is implemented by its 1981 Water Code. Softened somewhat by reforms in 2005, the Water Code represents a relatively unfettered market approach that allows private companies to acquire rights to large amounts of water from the government, often free of charge, and to buy and sell water freely on the open market.²⁷

The water market system, designed to promote "higher value" uses of water, also has some less desirable side effects. Water rights have become concentrated in a few hands, and in some river systems, crucial water rights are held entirely by foreign corporations. Indigenous peoples in mining country have been marginalized in the current water management scheme. And without water, they can no longer remain in their homes.²⁸

It is widely recognized that the system results in unsustainable water in arid regions with little or no recharge of groundwater. Climate change, with attendant glacier melt, exacerbates the problem. Water traded on the market is increasingly expensive.²⁹ The rising cost of water rights has stimulated investment in water technologies such as desalination.

According to water law scholars such as David Getches, treating water as a commodity with its value set on the open market "is in direct conflict with the way that these traditional people in the Andes have used it in the past" and with their belief that water is has "spiritual value." The system of marketing

²⁵ See, e.g., Water Resources Management in Chile, Wikipedia.

²⁶ THE INDIGENOUS PEOPLES OF CHILE: A study of human rights for three indigenous groups in Chile, faculty.smu.edu/rkemper/anth_4309-6309/Team_Report_Chile.ppt.

²⁷ Chile Considers Constitutional Reform of Freshwater Rights, CIRCLE OF BLUE WATERNEWS (28 January 2010), <http://www.circleofblue.org/waternews/2010/world/chile-considers-constitutional-reform-of-freshwater-rights/>.

²⁸ See [Alexei Barrionuevo](#), *Chilean Town Withers in Free Market for Water*, N.Y. TIMES (14 March 2009), <http://www.nytimes.com/2009/03/15/world/americas/15chile.html?pagewanted=1&r=1>.

²⁹ J. Arruete, *Water Scarcity in Northern Chile for Mining Projects: Present and Future*, International Conference Water in Mining WIM 2008 (10 July 2008), abstract available at http://www.hatch.ca/Energy/Articles/water_scarcity_chile.htm.

water rights undermines not only the value system of indigenous peoples, but their survival. They cannot outbid large mining corporations vying for scarce water.³⁰

The Actors

The increasing water scarcity in Chile's mining country has lined up actors on all sides of the constitutional and human rights issues. Supporters of the free market approach to water have included the World Bank, which lauded the Chilean system as a model to be emulated.³¹ The Bank responded to the economic virtues of the Chilean system—it offers security of water rights, which in turn promotes investment.³² Scholars such as Carl Bauer have pointed out the defects—an unfettered market approach does not deal well with environmental and social equity issues. It benefits primarily those actors who “are rich and powerful enough to get things their way regardless of what the law says.”³³

Actors such as indigenous peoples and environmentalists, seek to reverse the policies of the Pinochet era. A movement, the Frente Amplio para la Nacionalización del Agua (FANA), campaigned for a constitutional amendment. The movement found an ally in former President Michelle Bachelet. FANA, is a coalition of “left-leaning politicians, church leaders, environmentalists, and indigenous groups” that seeks to strengthen state control over water, including the power to expropriate water in the national interest.³⁴

These actors were opposed by business associations, like the National Society of Agriculture (SNA) and the Mining Council, which raised the issue of compensation for expropriation of property rights in water. Chile cannot afford to pay for these rights.

6. Energy Scarcity and Competition for Energy

Chile Is Facing Energy Crisis

³⁰ *Q&A: David Getches on Water Rights for Indigenous Cultures*, CIRCLE OF BLUE WATERNEWS (9 June 2010), <http://www.circleofblue.org/waternews/2010/world/qa-david-getches-on-water-rights-for-indigenous-cultures/#more-16442>.

³¹ Benjamin Witte, *A Candid Look at Chile's Controversial Water Market*, Patagonia Times (29 April 2009).

³² *Id.*

³³ *Id.*, quoting Prof. Carl Bauer.

³⁴ Benjamin Witte, *Chile: Movement to Nationalize Water Gains Ground* (31 January 2010), <http://benwitte.wordpress.com/2010/01/31/chile-movement-to-nationalize-water-gains-ground/>.

Chile's energy sector is facing a crisis.³⁵ Mining is one of the most energy-intensive industries in the world. One estimate is that mining and processing of ores produce about one percent of world income, while using 3 to 5 percent of all commercially sold energy.³⁶

The Chilean mining sector is therefore also pressed by energy scarcity. And as in the case of water, mining also competes with other industries and the needs of populations for the supply.

There are two main factors that have affected Chilean energy sectors in the last few years – the “La Niña” effect and cuts in the gas supplies from Argentina.

Weather conditions, drought and cold have caused precipitation to be at record lows, with resulting low water levels at reservoirs. A recent period of cold weather stopped ice and snow in mountainous regions from melting and supplying reservoirs. In 2008, rainfall records show the semi-arid region received one of its lowest levels of precipitation in half a century.³⁷ Many small communities in south-central Chile lost crops and livestock in the drought. More pertinent to the energy sector, Chile is highly dependent upon hydropower: over 40% of Chilean electricity comes from hydroelectric sources.³⁸ So if there is less water, there is also less electricity.³⁹ This is also a major concern that climate change might reduce precipitation.

While Chile has traditionally been dependent on electricity, in recent years there has been an attempt to diversify and use more natural gas. Because Chile has almost no gas of its own, all natural gas must be imported from somewhere. Bolivia, which has abundant gas, is hesitant to export to Chile because of long standing political tensions and conflict that go back to the War of the Pacific.⁴⁰

³⁵ Mark Turner, *Chile: Facing a Severe Energy Crisis*, LATIN AMERICA ECONOMONITOR: ROUBINI GLOBAL ECONOMICS (12 February 2008), http://www.roubini.com/latam-monitor/604/chile_facing_a_severe_energy_crisis.

³⁶ MMSD Working Paper No. 41 Energy and Sustainable Development in the Mining and Minerals Industries; [K.R. Rábago](#), [A.B. Lovins](#), [T.E. Feiler](#); <http://www.iied.org/pubs/display.php?o=G00540>

³⁷ Rodrigo Martinez, *Chile government hands out water in major drought*, REUTERS (21 February 2008), *republished at Environmental News Network (ENN)*, <http://www.enn.com/ecosystems/article/31573>.

³⁸ Aubrey Ann Parker, *The Price of Hydropower Pursuits in Patagonia*, CIRCLE OF BLUE WATERNEWS (18 February 2010), <http://www.circleofblue.org/waternews/2010/world/the-price-of-renewable-energy-pursuits-in-patagonia/>.

³⁹ Farther south, unlike the Atacama, there is considerable rainfall. So this is where most of the country's hydroelectric potential lies. This shortage is what lies behind the current and very controversial push to build hydroelectric facilities on some of the world's most beautiful and pristine free-flowing rivers, such as the Futalefú. See Futafriends, *The future of the Futalefú and other Wild Rivers of Chilean Patagonia* (Update, October 2006), <http://www.futafriends.org/pdfs/FF%20update%2011-06.pdf>.

⁴⁰ *War of the Pacific 1879-1884*, ON WAR, <http://www.onwar.com/aced/data/papa/pacific1879.htm> (last updated 16 December 2000).

In the mid 1990's, Chile entered into contracts with Argentinean gas suppliers for the supply of low -cost natural gas and began to invest heavily in gas infrastructure.⁴¹ During its economic crisis in 2002, Argentina decided to restrict gas exports to Chile (with cuts reaching nearly 50 percent of contracted volumes on some days) in order to ensure sufficient cheap supplies at home. The import cuts have caused shutdowns at power plants; Nehuenco I, one of Chile's largest power plants, was temporarily shut down in 2008.

As it cuts export volume, Argentina also increased natural gas prices. Continuing structural difficulties in the Argentinean natural gas sector could lead to continuing supply problems for Chile in the future.

Therefore, Chile has begun to pursue other sources of natural gas, such as liquefied natural gas or piped gas from other countries.⁴² At the same time, Chile began to reconsider its energy policy and look further afield for a diversification of energy sources. There is even considerable talk of Chile being forced to develop nuclear power.⁴³

Energy and Mining

Chile's copper industry may be heavily affected by the energy crisis.⁴⁴ Copper accounts for over 60% of Chile's export revenue. It is the largest single source of wealth creation in the country and has been a main motor of economic growth in the last five years.

Large industrial customers, mainly mining companies, account for around 90% of electricity of electricity consumption in the northern electricity system, serving an area in which only 6% of the population lives.⁴⁵ Because the energy sector is facing a crisis, companies are reportedly prepared to shut down non-essential machinery. Many mining companies have their own sources of backup power generation that can cover most but not all local power shortfalls. However, the use of backup generators will certainly add significantly to mineral production costs.

Energy shortages might create considerable opportunity for this sunny region to be a laboratory for technologies that reduce energy consumption. Chile faces the continuing challenge of finding additional energy supplies to fuel economic growth. Chile has limited fossil energy resources and depends on imports to meet three-quarters of its energy needs.⁴⁶ Imports from Bolivia and Argentina are both problematic for political reasons.

⁴¹ Doug Sims, *For long term security of electricity supply, Chilean energy policy must "go public,"* SWITCHBOARD: NATURAL RESOURCES DEFENSE COUNCIL STAFF BLOG (29 July 2010), http://switchboard.nrdc.org/blogs/dsims/for_long_term_security_of_elec.html.

⁴² Ed. Langdon D. Clough, *Energy profile of Chile*, in THE ENCYCLOPEDIA OF EARTH (4 September 2008), http://www.eoearth.org/article/Energy_profile_of_Chile. Information source: EIA.

⁴³ Editorial, Dr. Hector Torres-Silva, *NUCLEAR ENERGY: FUTURE OPTION FOR CHILE?*, INGENIARE. REVISTA CHILENA DE INGENIERIA (2007), <http://www.scielo.cl/pdf/ingeniare/v15n2/art01.pdf>.

⁴⁴ See Turner, *supra* note 35.

⁴⁵ See Clough, *supra* note 42.

⁴⁶ IEA, *Chile Energy Policy Review 2009*, http://www.iea.org/publications/free_new_Desc.asp?PUBS_ID=2159.

The country's electricity sector has faced three periods of significant stress over the past decade. The most recent episode took place in 2007/2008, when the loss of natural gas imports from Argentina was further exacerbated by a drought in the territory of the central electricity system, where hydropower normally accounts for over half of electricity generation.⁴⁷

The Chilean government had to take a series of measures to save energy in the future. The measures included: a 10% reduction of voltage supplied to domestic users, implying that supply will be dropped from the normal 220v to 198v; an extension of daylight-saving time to the last week in March; an enforced 5% cut in power consumption in government offices; distribution of energy-efficient lighting; and pledges from industry to save electricity by turning off non-essential machinery.⁴⁸

The increasing energy demand from the mining sector in the north is a major driver of these problems; energy scarcity limits the development of some of the world's richest mineral reserves. On the negative side, this increases political tensions with neighboring countries, and drives Chile toward energy solutions that may have environmental consequences, such as hydro dams in the south, or nuclear power. On the other hand, it may mean that Chile has some ideal conditions for development of renewable energy and energy conservation measures.

7. Public Participation

The Chilean public, whose voice was stilled during the years of dictatorship, is now demanding a much greater role in decision making, and the question of how the country's political system adapts to an increasing role for local community opinion is a major issue for the mining sector, as it is more broadly in Chilean society.

The environmental impact review system (called SEIA, or Sistema de Evaluación de Impactos Ambiental) was established in 1994.⁴⁹ It is a complicated and often confusing process. The law states that owners of proposed projects must provide either a Declaration of Environmental Impacts (DIA) for projects with smaller effects, or a Study of Environmental Impacts (EIA) for projects causing one or more major impacts on the quantity and quality of natural resources and significant effects on the landscape.⁵⁰

Study of Environmental Impacts (EIA)

If a project affects more than one of Chile's 15 regions, the National Environmental Commission (CONAMA) conducts the review. If a project's impacts remain within a single region, the review process

⁴⁷ *Id.*

⁴⁸ Turner, *supra* note 35.

⁴⁹ Amanda Maxwell, *We may be here for a while: Chile's Environmental Impact Review Process*, SWITCHBOARD: NATURAL RESOURCES DEFENSE COUNCIL STAFF BLOG (14 December 2009),

http://switchboard.nrdc.org/blogs/amaxwell/we_may_be_here_for_a_while_chi.html.

⁵⁰ *Id.*

is conducted by the respective Regional Environmental Commission (COREMA), under direction of that COREMA's Intendente.

A company proposing a project officially begins the environmental review process when it publishes an excerpt from its EIA in the official gazette and regional newspaper. The environmental authority (either CONAMA or COREMA) distributes the full EIA to the relevant state agencies (e.g., the National Water Authority, the Ministry of Agriculture, etc.) and local municipalities, which have 120 days to review the document and submit their comments to the authority.⁵¹ Then the environmental authority will convene all of the state agencies to discuss and vote on the EIA. The agencies could approve, reject or send the environmental study back to the company to make improvements (which they would deliver in an additional document called the Addenda). In this last option, the agencies would consolidate their observations into one document (called an ICSARA, or Informe Consolidado de Solicitud de Aclaraciones, Rectificaciones y Ampliaciones) and deliver it to the company.

In this phase of the process, the public has an opportunity to participate for 60 days.

All EIAs are available to the public online. Affected citizens, communities, NGOs, professional groups and others can submit their own comments on the EIA to COREMA (or CONAMA), which is expected to consider these observations when making its own decision on the EIA. However, there is no legal requirement for the company to address the public comments.

If the environmental authority does not approve the project, the company can resubmit the project for second review phase which is similar to the first one with one exception – there is no opportunity for public participation.

Pascua Lama Project

The Pascua Lama project marks a watershed in Chilean attitudes toward mining, the environment, and the rights of the public. Ten years ago, many Chilean leaders believed that mine protests were something that occurred somewhere else, but never in Chile, a country that lived by and accepted mining. Pascua Lama shattered that belief system.

The Pascua Lama ore deposits lie at the crest of the Andes under three Andean glaciers. The mine endangers three glaciers which are an important source of water for the Huasco valley's farmers. This valley is home to 70,000 people, mainly small farmers who grow grapes, olives and other crops.⁵² The first environmental impacts study that the mining company, Barrick Gold, submitted to the Chilean authorities neglected to mention the glaciers. It was the farmers of Huasco Valley who warned CONAMA.

⁵¹ *Id.*

⁵² Gustavo Gonzales, *Pascua Lama Gold Mine, a Threat to Sustainability*, IPS (5 June 2006), <http://ipsnews.net/news.asp?idnews=33501>.

According to the Halifax Initiative,⁵³ “the mining company deliberately undermined the Chilean environmental impact assessment system by dividing the Pascua Lama project into parts, which it presented separately for evaluation.⁵⁴ At least five components have been assessed independently of the mineral extraction project, following approval of the latter.

This “piecemealing” strategy – critics assert -- allowed the company to minimize the overall impact of the project and to hide its inter-regional character, thereby avoiding an environmental evaluation at the national level (as opposed to the less complex regional assessment). In addition, the company was able to submit relatively small projects to the evaluation system, which involve a much simpler procedure than if the project had been considered as a whole.⁵⁵ The observations provided by the public were said by critics not to be taken into consideration, and the formal process for public participation in the SEIA did not work.

The net result was an explosion of public protest, and enormous problems for the mining company as it sought approval.⁵⁶ The myth that Chileans will never oppose a mining project was shattered. Dealing with public concerns and public opposition is now a requirement for Chilean mine development as it is in most other places in the world.

If social movements in opposition to mining are now part of the landscape, and if mining is creating increasing intense competition for water and energy, the real question now is how, institutionally, politically, and legally Chile will accommodate the citizen voice in mineral development.

8.. Mine Safety

Safety conditions in the large mines in Chile generally meet international standards, though no mine is ever safe enough, and improvement must always be a goal. The same has not been true for the small and medium mining sector.

A recent accident at San José copper and gold mine focused considerable attention on poor safety conditions in small and medium-sized mine sector in Chile. Miners unions had continuously criticized the San José mine for its faulty safety measures, but the company attracts workers with higher than average

⁵³ The Halifax Initiative is a coalition of Canadian non-governmental organizations that includes development, environment, faith-based, human rights and labor groups, see <http://www.halifaxinitiative.org/content/about-hi>.

⁵⁴ The project is a transborder project, and part of it is in Argentina; in fairness the environmental review of a project which is partly assessed under the Chilean system and partly by Argentine authorities does present some unusual challenges.

⁵⁵ Halifax Initiative, letter to Fred P. Hochberg, President, Export-Import Bank of the United States, *Chilean Communities and CSOs Urge U.S. Ex-Im Bank to Reject Pascua Lama* (10 May 2010), <http://www.halifaxinitiative.org/content/chilean-csos-urge-us-ex-im-bank-reject-pascua-lama>.

⁵⁶ See, as one of many examples, “Barrick’s Project Denounced as Illegal,” <http://protestbarrick.net/article.php?id=456>.

salaries and benefits.⁵⁷ The San José mine had a record of 80 accidents.⁵⁸ In 2004, a miner died after a cave-in. In 2006, a truck driver in the mine was also killed in an accident. That same year, 182 workers were injured, 56 seriously.⁵⁹ After another deadly accident in 2007, Sernageomin, the government body responsible for supervising mining safety standards, ordered the San José mine to close. However, few months later, the mine reopened even though it had not complied with the basic safety measures ordered by Sernageomin.⁶⁰ One of the neglected safety measures was the completion of the evacuation ladder; a ladder that could have saved the trapped miners if it had been fully in place.⁶¹

A few days after the accident, the President Piñera dismissed the national director of Sernageomin and other top agency officials and announced a series of measures such as a new mining inspectorate responsible for authorizing mine production and exploration plans and regulating safety within the industry.⁶² Sernageomin claims that it does not have the resources or enough personnel to supervise all the mines in Chile. It has closed 18 small and medium sized mines in the Atacama region since the accident. Most of them were closed for unsafe working conditions, including lack of ventilation shafts, alternative evacuation exits and emergency shelters.

But laws and regulations are not the problem. “Chile has one of the strictest mining safety standards in the world, especially in large mining operations, with specific codes and its own regulatory agency,” said mining engineer Augustin Holgado. “The problem is enforcement, especially in medium to small-size mines.”⁶³ The issue is simply that some of these mines are economically marginal but at the same time considerable local employers; the political will to enforce has been lacking.

CONFEMIN (Confederación Minera de Chile), miners union, represents more than 1800 miners who work at small, medium-size and large privately-owned mines in Chile.⁶⁴ Its president, Néstor Jorquera, believes that the ratification of International Labor Organization Convention 175 on safety and health in mines will be the best way to show that the improving conditions would really happen.

In any case, current events dictate that there will be an increased pressure to promote safety and health for miners, especially in the small and medium sized mines.

9. Indigenous rights

⁵⁷ *Chilean Miners Speak to Loved Ones in Emotional New Video*, GLOBAL POST (29 August 2010), <http://www.globalpost.com/dispatch/chile/100828/mine-safety>; see also, Cesar Uco, *Chile’s trapped miners: Victims of a ruthless drive for profit*, WORLD SOCIALIST WEBSITE (3 September 2010), <http://www.wsws.org/articles/2010/sep2010/chil-s03.shtml>.

⁵⁸ *Id.*

⁵⁹ Uco, *supra* note 43.

⁶⁰ *Id.*

⁶¹ *Id.*

⁶² *Safety: Chile to launch a new mining inspectorate*, DAILY NEWS (5 September 2010), <http://www.canadianminingjournal.com/issues/story.aspx?aid=1000383998>.

⁶³ *Chilean Miners Speak to Loved Ones*, *supra* note 38.

⁶⁴ *Llegan soportes para acelerar perforacion*, CONFEDERACION MINERA CHILE (28 September 2010), <http://www.confemin.cl/>.

On September 15, 2008, Chile ratified the International Labour Organization's (ILO) Indigenous and Tribal Peoples Convention No. 169 "the Convention," a legally binding international instrument which seeks to ensure that indigenous and tribal peoples are consulted and fully participate at all levels of decision making processes that concern their rights.⁶⁵ Articles 2, 6 and 15, require that States fully consult with indigenous peoples and ensure their informed participation with regard to their lands and resources, among other things.⁶⁶ Further, according to the Commission on Human Rights, "consultation must be undertaken in good faith, in a form appropriate to the circumstances and with the objective of achieving consent."⁶⁷

In Chile, ratified international treaties, such as ILO Convention 169, have the full force of Chilean law.⁶⁸ The Chilean Constitution "establishes that sovereignty recognizes as a limitation in its exercise the essential rights deriving from human nature, and that it shall be the duty of State bodies to respect and promote such rights, as guaranteed by the Constitution."⁶⁹ A country has one year from the date of ratification to align its legislation, policies and programs with the Convention before it becomes legally binding.⁷⁰ After ratification, each signatory is subject to supervision by the ILO's Equality Team with regards to implementation of the Convention. Supervision includes the submission of various reports to the Equality Team.

This poses some very considerable issues in Chile. Does, for example, mineral exploitation in traditional indigenous territories, or use of traditional indigenous resources such as water require consent of the affected communities? If so, what are the limits on that right, and what are the procedures for seeking and receiving the necessary consent? There are some indications that Chilean courts will in fact treat this right very seriously.⁷¹ This creates another source of stress for a minerals industry that is in competition with native peoples for scarce water and other resources.

10. Environmental Institutions

Chilean mining law developed concurrent with Chile's market-oriented reforms in the 1980's.⁷² These basic laws, governing only mineral tenure and basic property rights, were supplemented by the General Law for the Environment in 1994, creating the National Commission for the Environment (CONAMA), which coordinates environmental policy and standards among a number of ministries and other public

⁶⁵ ILO, Convention 169, list of ratifying countries available at <http://www.ilo.org/ilolex/cgi-lex/ratifce.pl?C169>.

⁶⁶ COMMISSION ON HUMAN RIGHTS, E/CN.4/Sub.2/AC.4/2005/WP.1, page 5, LEGAL COMMENTARY ON THE CONCEPT OF FREE, PRIOR AND INFORMED CONSENT.

⁶⁷ *Id.*

⁶⁸ Indigenous and tribal peoples' rights in practice: a guide to ILO Convention No. 169, International Labour Office, Geneva, ILO, 190 (2009).

⁶⁹ *Id.*

⁷⁰ ILO, *Convention 169*, <http://www.ilo.org/indigenous/Conventions/no169/lang--en/index.htm>.

⁷¹ See *Recent court ruling on indigenous water use rights in Chile could have implications on geothermal*, <http://thinkgeoenergy.com/archives/3144>.

⁷² Bastida et al., *supra* note ____.

services.⁷³ This framework was further supplemented in 1997 with the institution of the Environmental Impact Bylaw.⁷⁴

In November 2009, sweeping legislative reforms were instituted in Chile to create the country's first environment ministry.⁷⁵ This new system is expected to resolve environmental issues more efficiently, as well as increase the political clout of environmental institutions within Chilean government and society. The Ministry will oversee environmental policy and regulations as well as conservation of biodiversity, water and renewable natural resources. The Ministry's new departments include "an Environmental Impact Evaluation Service to analyze development-project proposals and an Environmental Superintendency and an enforcement arm empowered to sanction companies using stiff monetary penalties and the removal of environmental permits for non-compliance."⁷⁶ A National Biodiversity and Protected Areas Service will also be formed within the ministry to oversee the country's national parks system.⁷⁷

All of these will apparently require a considerable improvement in environmental performance by Chilean mining if it is to expand and thrive.

*Necessity for changing the system for environmental permits*⁷⁸

The 2009 legislation includes modifications to the environmental-impact evaluation system. There will be stricter standards on what kinds of projects can be submitted to the environmental-impact assessment system. One of the greatest reforms (if enforced) is that projects will no longer be considered piecemeal, instead requiring regulators to look at the entire environmental impact of large projects. The evaluation of a development project will now include a study of how the project will impact a region's environment overall. One problem with the new system is that while authorities may request that a company use the best technology available, compliance with such request is not mandatory.

The environmental commission that makes permitting decisions must take into account the views of public agencies as well as public comments. If a permit approval runs counter to the views of public agencies, citizens may petition for the permit's revocation. In the very recent past, this system has been fraught with problems. In the recent past, project proponents have completely side-stepped the public comment period by pushing projects through the using the simpler Statement of Environmental Impact.⁷⁹ Another issue that has loomed over the permitting process is the timing of the Statement of Environmental Impacts. The review process is also quite biased towards companies, allowing for

⁷³ *Id.*

⁷⁴ *Id.*

⁷⁵ Tom Azzopardi, *Cleaning Up Environmental Regulation*, BUSINESS CHILE MAGAZINE (January 2010), <http://www.businesschile.cl/en/news/cronica/cleaning-environmental-regulation>.

⁷⁶ EcoAméricas, *Environmental reform in Chile on eve of election*, (December 2009).

⁷⁷ *Id.*

⁷⁸ For a good review of the environmental impact review process, see Maxwell, *supra* note 32.

⁷⁹ ALBERT BRETON, ET AL., ED. *ENVIRONMENTAL GOVERNANCE AND DECENTRALIZATION* (Edward Elgar Publishing Ltd. 2007)

repeated delays in providing documentation in the environmental review process, while state agencies must work within restrictive deadlines.⁸⁰

Accession to the OECD has also put pressure on Chile for stronger regulation. In their 2005 report, the OECD recommended Chile create an environmental inspectorate and strengthen its enforcement of existing environmental laws.⁸¹ Further, studies show there has been a lack of oversight of the environmental commitments made by private companies.⁸² Further, the OECD has recommended that Chile strengthen its “environmental information system, including environmental indicators, to support government accountability and public information.”⁸³ While the 2009 legislation addresses some of these concerns, the big issue is whether these new environmental institutions will be functioning in the same spirit as the legislation.

The 2009 reforms also created special environmental courts, allowing companies to challenge sentences imposed by regulators and be heard by judges competent in economics and the sciences.⁸⁴ Regulators are reluctant to hand out fines, but when given, they range from 409,440 pesos (US\$809) to 16,377,600 pesos (US\$32,360) annually.

Chile joining the OECD

Chile became the 31st member of the Organisation for Economic Co-Operation and Development (OECD) on May 7, 2010 and the first country in South America to do so. An invitation to join this exclusive club is not only a nod to Chile’s economy; it ensures Chile’s convergence with OECD countries’ environmental standards and practices. Chile’s environmental practices had been heavily criticized by the OECD and were seen as an obstacle to a membership invitation, but the 2009 environmental reforms cleared the path for this much coveted invitation.

Chile’s accession to the OECD has inspired further environmental reform. In January 2010, President Michelle Bachelet signed Law 20.417. This law redesigns Chile’s bureaucratic infrastructure, increasing transparency and placing greater emphasis on public participation. The 2010 law builds on the 2009 reform establishing a new Ministry of Environment. The Ministry is charged with developing environmental policies and implementing them with regulations. The Ministry is also responsible for

⁸⁰ HidroAysén's latest delay highlights a clear bias in the environmental review process, NRDC Blog, http://switchboard.nrdc.org/blogs/amaxwell/hidroaysens_latest_delay_highl.html. The recent and controversial HidroAysén project highlights this environmental review issue. Head of Region XI’s Environmental Commission (COREMA) has allegedly acted “illegally” when he unilaterally decided to extend the project’s evaluation process, even before the public comment period finished. This decision is being challenged by the Patagonia Defense Council and Congressional members and petition is currently awaiting final appeal before Chile’s Comptroller Tribunal.

⁸¹ OECD Environmental Performance Reviews: Chile (2005), http://www.oecd.org/document/32/0,3343,en_33873108_39418658_34856224_1_1_1_1,00.html.

⁸² Breton, *supra* note __.

⁸³ OECD Environmental Performance Reviews: Chile (2005), *supra* note __.

⁸⁴ Azzopardi, *supra* note 80.

conserving water and water-related biodiversity. The new institutional framework also includes a Service for Environmental Evaluation and Superintendency for the Environment, responsible for monitoring compliance with environmental permits.⁸⁵

While this may be a sign of progress for Chile, it will raise the bar of environmental and social performance for mining companies.

⁸⁵ Chile's President Michelle Bachelet Signs New Law Creating Environmental Ministry, Beveridge & Diamond website, <http://www.bdlaw.com/news-782.html>.