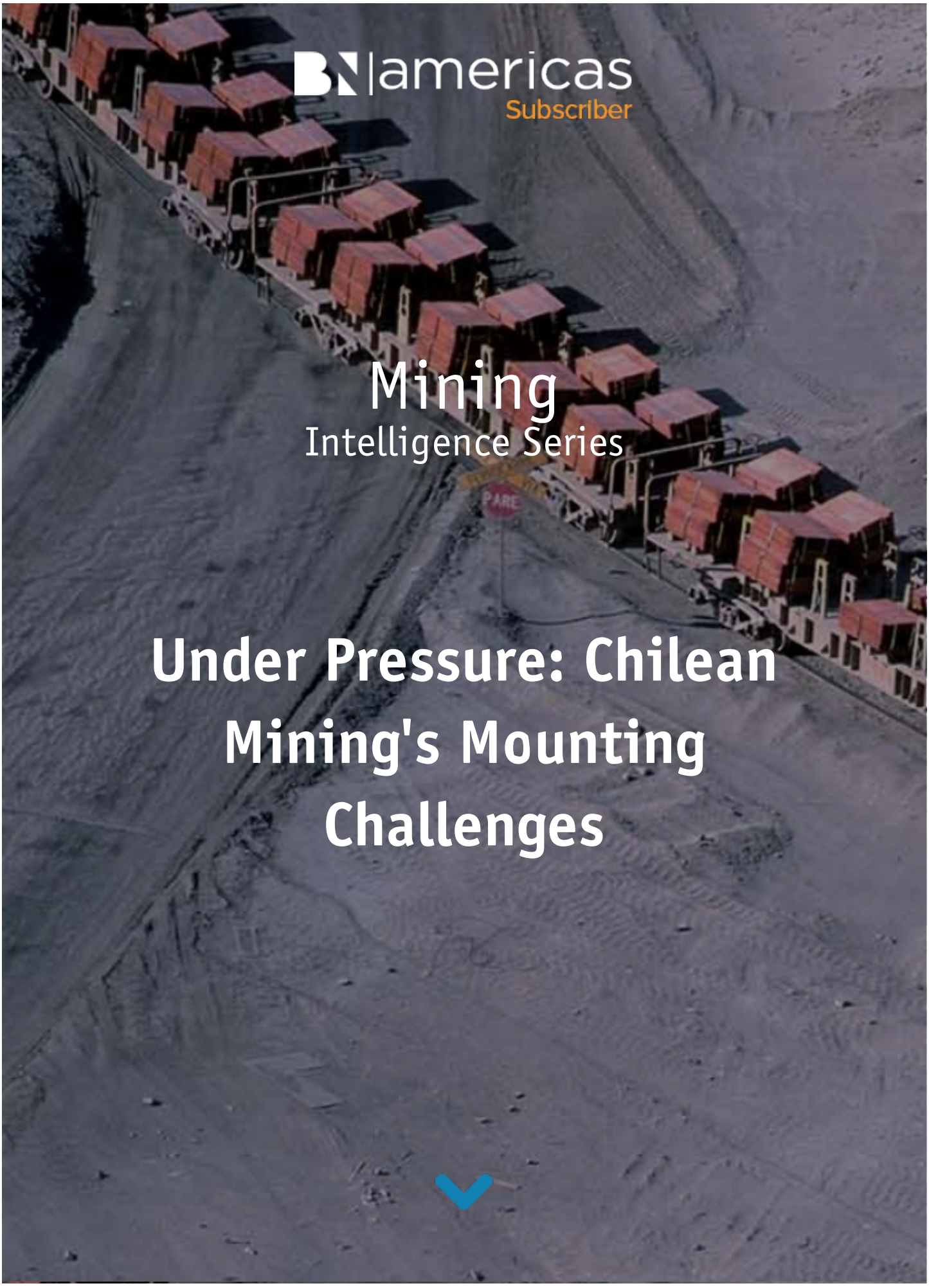
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Mining
Intelligence Series
Under Pressure: Chilean Mining's Mounting Challenges

Table of Contents

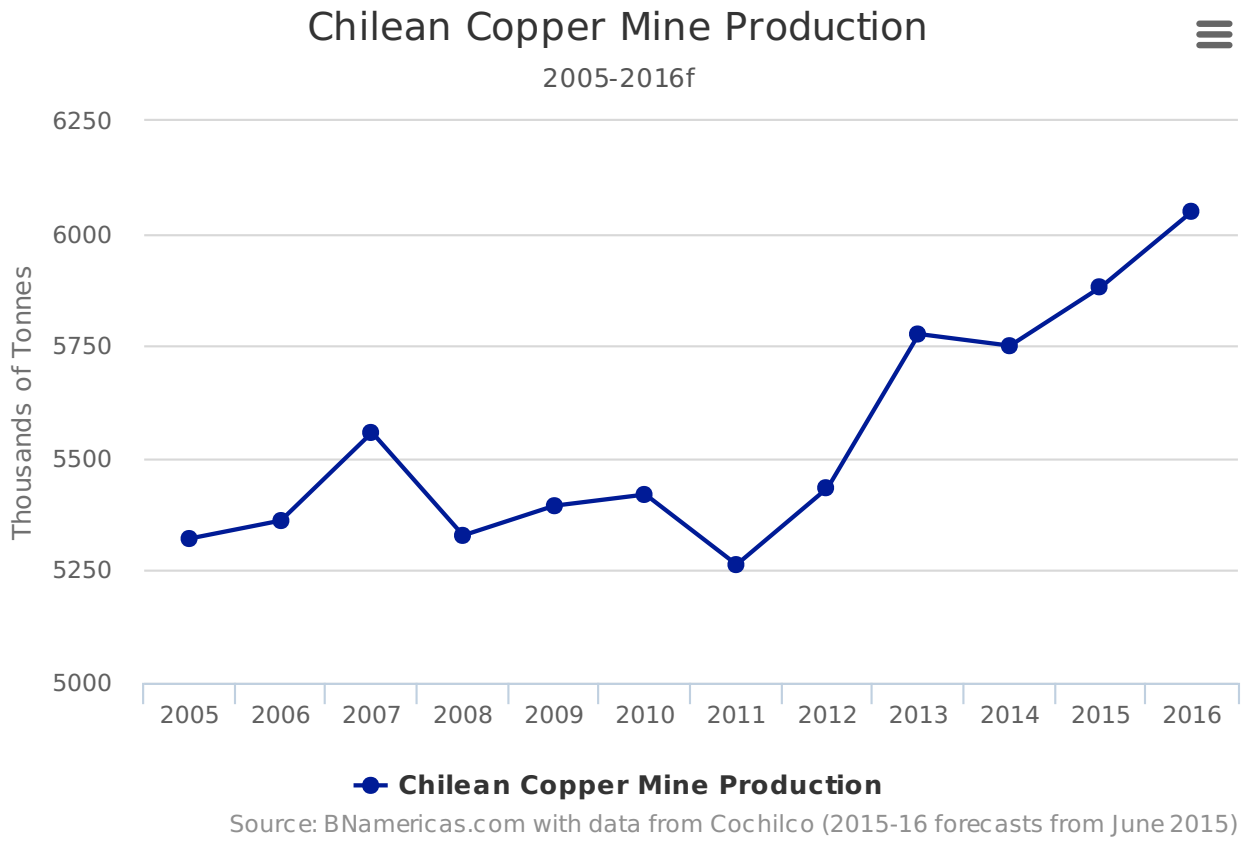
Introduction

The Chilean mining industry is losing competitiveness. In 2000 Chile's average copper cash cost was the 5th lowest in the world at US$0.43/lb. In 2013 it was in 23rd place at US$1.765/lb, according to figures from Wood Mackenzie and state mining company Codelco. Countries with lower average copper cash costs than Chile's today include Mexico, Peru, the US and China. Although Chile produces a host of minerals, copper is often considered the nation's cash cow and is essential to the economy: red metal exports were worth some US$38 billion in 2014, 50% of total exports and equivalent to about 15% of GDP, even considering weakening copper prices.

But mining in Chile is getting more difficult and more expensive. Chile's average copper grades are sinking faster than the world average, putting significant pressure on productivity and increasing miners' demand for scarce water and energy, while wages are also rising fast.

Other, less quantifiable factors such as growing socio-environmental pressure and permitting risk or the elimination of foreign investment protections are also playing a role in turning Chile into a place investors must carefully consider rather than the obvious place to invest. Regaining competitiveness is the number one challenge facing the sector.

Figure: Chilean Copper Mine Production



Source: BNamericas.com with data from Cochilco (2015-16 forecasts from June 2015)

Potential Persists Amid Hard Times

While it is no doubt a trying time for the industry at a global level, not all is doom and gloom for Chile, by far the world's largest copper producer with 5.75 million tonnes (Mt) in 2014. The country is still home to four out of five of the largest copper mines in the world, and nearly half of the top 20 are Chilean. USGS estimates show the country holds some 209Mt of copper reserves, more than twice

Australia's and about three times Peru's, demonstrating Chile's vast potential for further copper mine development. An estimated 3.5 billion tonnes of copper worldwide remains undiscovered with most estimated to be in the Andean region. State-owned Codelco is the biggest copper producer in the world accounting for 11% of world production, having produced 1.8Mt and registering US$10 billion in sales in 2014. State copper commission Cochilco forecasts rising red metal production in the coming years: 5.88Mt in 2015, 6.05Mt in 2016, and as high as 7.7Mt in 2025, depending on the success of proposed development projects.

Chile is also the world's biggest producer of lithium (60,646t lithium compounds in 2013), iodine (20,656t in 2013) and natural nitrates (759,384t nitrate compounds in 2013), though these minerals bring in much less revenue than copper, and is among the top ten producers of silver (50.5 million ounces in 2014) and molybdenum (48,770t in 2014) thanks to byproduct output from its large copper mines. Although the country's gold production volume ranks lower on the global scale (1.48 million ounces in 2014), the yellow metal brought in the second highest export revenues of any mining product after copper.

Practically all of Chile's molybdenum and 73% of its silver output comes as byproduct from copper mines, as does 40% of its gold, thus falling international prices for these metals - on top of falling copper prices - have exacerbated the upward cost pressure facing Chile's copper miners.

Indeed, the global mining industry in general has been suffering from declining metals prices over the last couple of years. But mining is cyclical and while Chile's biggest commodity buyer, China, is mired in economic difficulties a reversal will eventually take shape, though it is highly unlikely that copper prices will return to their 2011-12 peaks in the foreseeable future.

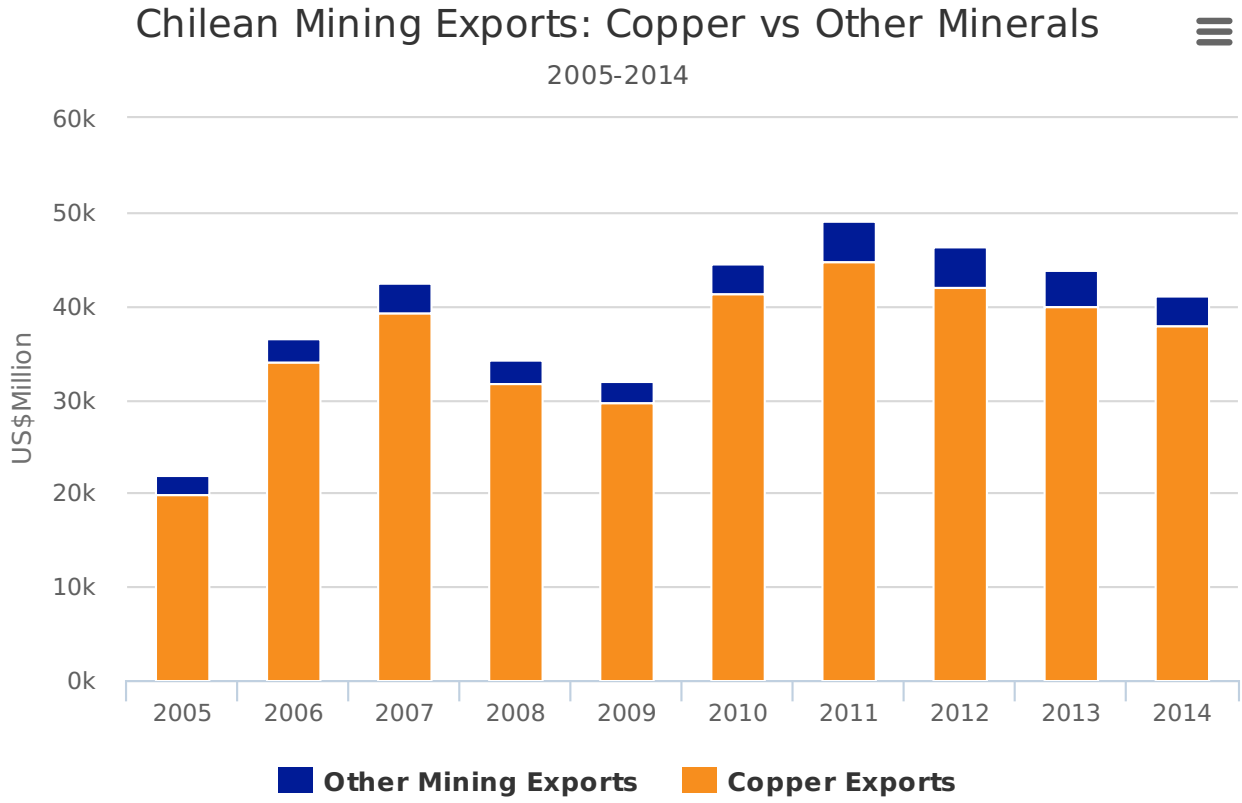
Codelco's Chuquicamata mine. Credit: AFP

Codelco and other majors such as BHP Billiton and Antofagasta are investing through the down cycle, pushing ahead with multiple multi-billion-dollar copper development projects that will help support the sector's investment profile in the coming years. But even with a total US$77 billion in mining investment forecast for the coming 10-year period, Chile's red metal production is set to rise only marginally, as much of the investment is needed just to replace capacity at deposits that are close to depletion and a great deal of investment is required by the mining companies to address water and power supply. Operating costs will rise, too, as the amount of ore processed increases at a much faster pace than the volume of copper extracted.

Chilean mining is also losing competitive advantages in other key areas. For example, BHP Billiton has said that in the US it can pay a truck driver roughly US$60,000 per year versus US$70,000 in Chile and have access to an abundance of fresh water instead of having to desalinate. For a nation that is not yet considered "developed" Chile's advantage should be lower costs across the board, but this is no longer the case.

In that sense, lower prices, declining ore grades and rising costs have placed innovation and efficiency at the forefront. But the question remains of whether Chile's mining industry will be able to surmount the challenges at hand and turn reserves into an above-ground reality.

Figure: Chilean Mining Exports: Copper vs Other Minerals



Source: BNamericas.com with data from Chilean central bank

Grades and Productivity Fall, Wages Rise

Perhaps the essential challenge facing Chilean mining is declining ore grades and deeper ore bodies, which mean companies must extract, move and process greater volumes of ore just to maintain fine copper output levels, and deeper ore is often harder, requiring more energy for crushing and grinding.

Chile's average copper ore grade sank from a peak of higher than 1.45% in 1996 to some 0.8% in 2012. While the world average grade in 2012 was still lower than Chile's (closer to 0.7%) the intensity of the drop over this period globally has been less dramatic than the drop in Chile.

Many estimates posit that average ore grades could fall as low as 0.6% by 2020. Codelco has invested US$3.5 billion to enable even deeper extraction at its El Teniente mine, the world's biggest underground operation, yet its production costs have increased at a much greater clip than production volume (193% direct cash cost increase between 2007 and 2011 with production only increasing 8%). To keep up production levels, mining operations must grow larger, meaning more initial capital expenditure and higher operating costs. A bigger footprint also means bigger challenges around social consultation and permitting.

A related trend is the marked drop in productivity in Chile's copper mines, which fell 50% in 2003-12, according to Cochilco. BNamericas' 2014 Mining Intelligence Series report "The Productivity Imperative" noted that, according to Cochilco, up to 33% of the productivity drop can be explained by geological factors when using lower ore grades alone as a proxy for such factors. A greater portion of the drop - 48% - can be explained by geological factors when using energy consumption as a proxy, a more telling calculation because it takes into account the productivity issues associated with lower

grades, such as the greater distances trucks travel around larger pits, harder ore and larger ore volumes.

The rest of the productivity drop is attributable to practices in mine development and investment adopted during the recent commodity price super cycle, which drove mining companies to speed up the construction of new capacity and increase the size of operations in search of economies of scale.

Radomiro Tomic mine. Credit: Codelco

While productivity has fallen, wages in the mining industry have grown, and faster in Chile than elsewhere. Chilean indexed mining wages grew from 100 to 165 from 2006 to 2012, while the index showing productivity defined as ore processed per worker fell from 100 to 81, figures compiled by Chile's mining council show.

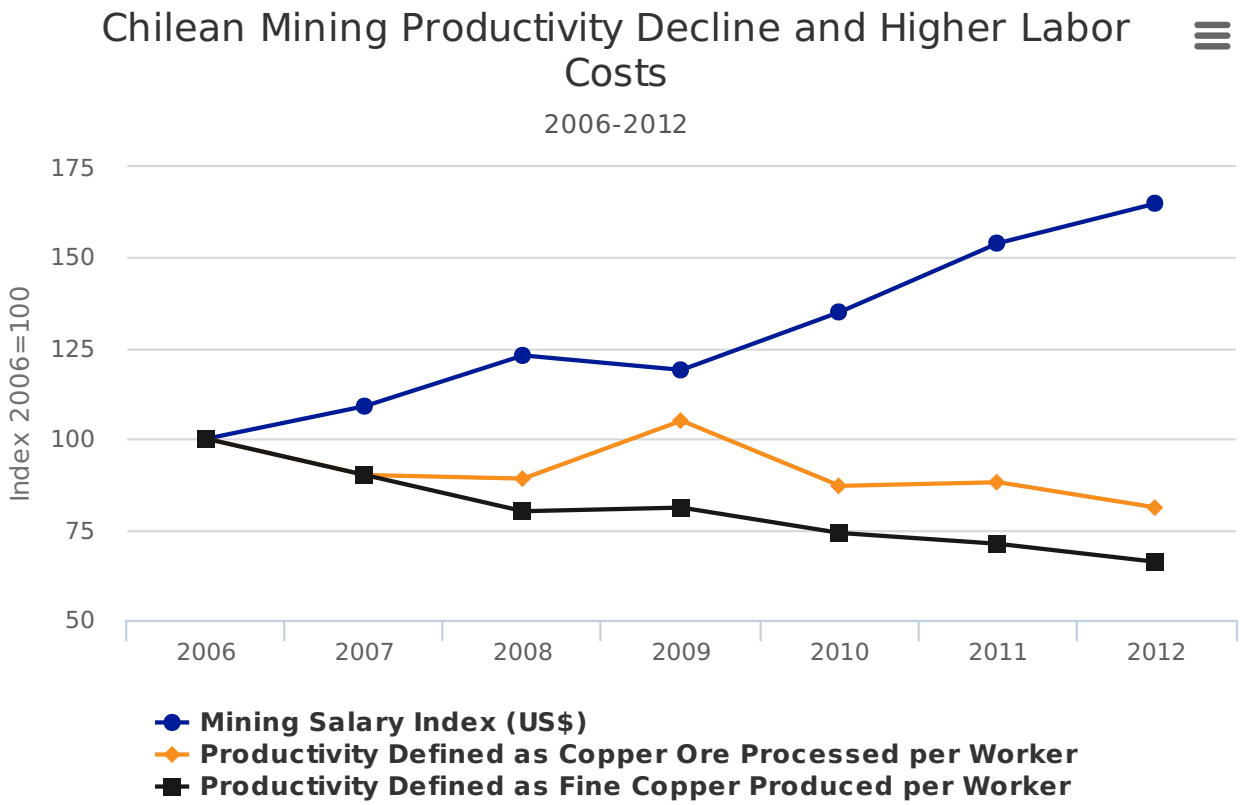
A comparison by Australian national science agency CSIRO shows that annual average mining salaries in Australia, Canada and the US rose 22% in 2007-12, while Chilean mining salaries rose 52% in the same period. The study also showed that average pay in Peru, Mexico, Russia, China, Zambia and the Democratic Republic of the Congo rose faster than in Chile at 63%, but actual wages remained vastly lower than Chile's.

Even so, recent projections point to an acute shortage of skilled mining labor in Chile, which faces an oversupply of professionals in other areas and a lack of engineers and IT specialists, while the image of mining as "dirty and isolated" is still detracting many students and young professionals from pursuing mining careers.

Minister Williams estimates, "a need for 27,000 new workers between 2014 and 2023." Maintenance and fixed plant and mobile equipment operators are in the highest demand but a lack of training

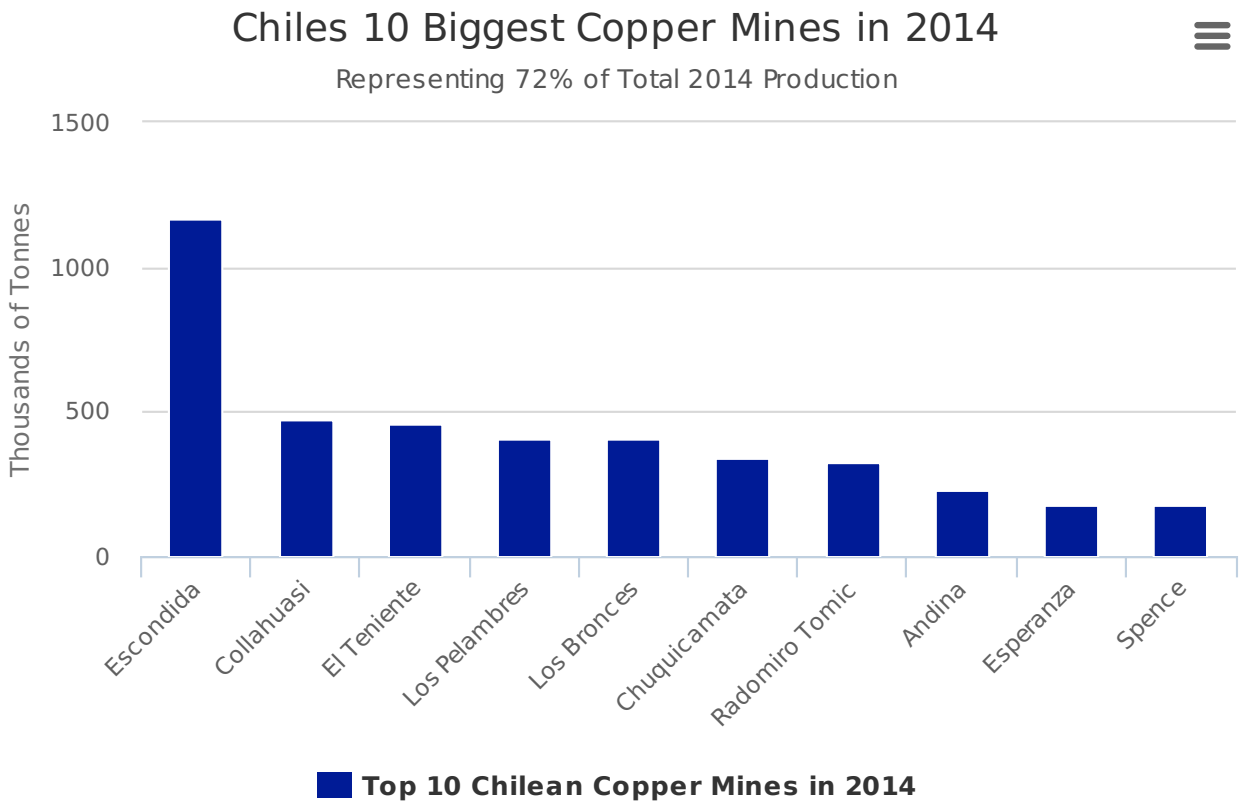
programs in these specific areas has relegated companies to develop on-the-job programs.

Figure: Chilean Mining Productivity Decline and Higher Labor Costs



Source: BNamericas.com with data from Consejo Minero (based on Sernageomin, Cochilco, INE)

Figure: Chile's 10 Biggest Copper Mines in 2014



Source: BNamericas.com with data from Cochilco

Water and Energy Scarcity Threaten Investment

While the Atacama Desert is a mineral windfall, a persistent challenge is the lack of water. The World Bank reports the minimum amount of surface water runoff required for sustainable development is 2,000 cubic meters per person per year. The world average is 6,600 and Chile registers an impressive 53,000. The problem is nearly all is concentrated in the south with a paltry 800 in the central and northern mining regions of the country.

"Prior, water use and how it was managed was considered strategic in mining. Now it's critical," notes Jorge Cantallopts, director of research and public policy at the Chilean copper commission Cochilco, which estimates that between now and 2025 total water usage in the mining industry will increase by 66%. Miners are increasingly turning to the Pacific Ocean for water supply, but while desalination in itself is not overly costly in operational terms, pumping and transporting the water up to the mines is. BHP Billiton knows this first-hand. The company is constructing a US$3 billion desalination and pipeline system to support expansion at its massive Escondida mine, which, apart from requiring a large upfront investment, is expected to triple water costs.

"The state needs to have a larger role from a public policy standpoint regarding the use of water," according to Cantallopts.

Antofagasta Minerals' Esperanza mine, part of what is now defined as the Centinela division, was the first mine in Chile to use direct seawater and the company plans to continue to use saline seawater as part of its US$4.35bn Centinela expansion project. Approximately US$10bn has been invested or is in the pipeline to finance 16 mining related desalination projects. In 2014, seawater represented 16% of total water usage as compared to just 9% one year earlier.

But while reliable and cost-effective water sourcing will continue to be an issue for the mining community, as will greater efficiency in water use, energy is the critical component. "Simply, mining will not be present in Chile without the energy resources we need," remarked Chile's mining minister, Aurora Williams, at the BNamericas LATAM Mining Innovation Summit 2015 (LMIS 2015), a two-day conference that brought together a global audience of experts from a range of disciplines to address developments in the technology and innovation arenas and their potential to change the face of mining.

Escondida's Organic Growth Project 1. Credit: Bechtel

Without a cost efficient energy solution, desalination projects, automated mining, and a host of other initiatives will be too expensive. Energy consumption by Chile's mining industry between 2001 and 2011 ballooned by 59% and is expected to increase another 91% to 40 terawatt hours by 2021, according to Cochilco. Chilean mining companies devour an average of 25 megawatt hours (MWh) of energy per tonne of ore processed, roughly 10% greater than other countries and miners in Chile pay more for electricity than in most other countries competing for mining investment, including the US. BHP Billiton has said it spends 3 to 5 US cents a kilowatt hour for electricity in the North American country compared to 12 to 15 cents in Chile.

Compared to Colombia, China and Canada, Chile's average industrial electricity price ranks above all three at an average of US$150.66/MWh. Canada registers just US$69.89/MWh while China averages US$142.71/MWh. Prices in Chile are highly variable and impacted by the lack of connection between the Norte Grande Interconnected System (SING, *Sistema Interconectado del Norte Grande*) and the Central Interconnected System (SIC, *Sistema Interconectado Central*), though the government's 2014 energy agenda addresses this problem and projects to connect the grids are in the works. Chile used to be able to rely on natural gas from Argentina, but contracts have been broken; a nuclear proposal was put to rest after the 2011 Japanese earthquake and tsunami; and new generation projects, notably coal-fired plants, have been suspended due to community opposition. Indeed, with power prices on the rise, demand growing and uncertainty around many new generation projects, questions about future power supply and cost are an important factor slowing down mining companies' decisions to invest in new capacity. The need to become more energy efficient is greater than ever.

Miners Focus on Renewable Power and Efficiency

Non-conventional renewable energy (NCRE) generation in Chile nearly tripled last year reaching 546 gigawatt hours by January 2015. NCRE now represents 9.15% of total generation as compared to just 3% in 2012. Solar energy specifically experienced the largest increase with installed capacity rising from 6MW to more than 400MW between 2013 and 2014. Bartley Doyle, general manager of the private, Dublin-based Mainstream Renewable Power is understandably bullish. The company arrived in Chile prior to the massive ramp-up (244MW of installed projects in 2013 compared to 982MW by the end of 2014) that has taken shape over the past few years.

"There were only 3-4 projects when we first arrived six years ago. But the competition began to flood in 3-4 years ago, mainly from Europe and the US," Doyle notes. For 2015 there are 2,097 projects in operation ranging from biomass to mini-hydro to solar. Another 1,242 are under construction and an impressive 14,725 have already received the requisite permits to begin construction.

Wind farm in northern Chile

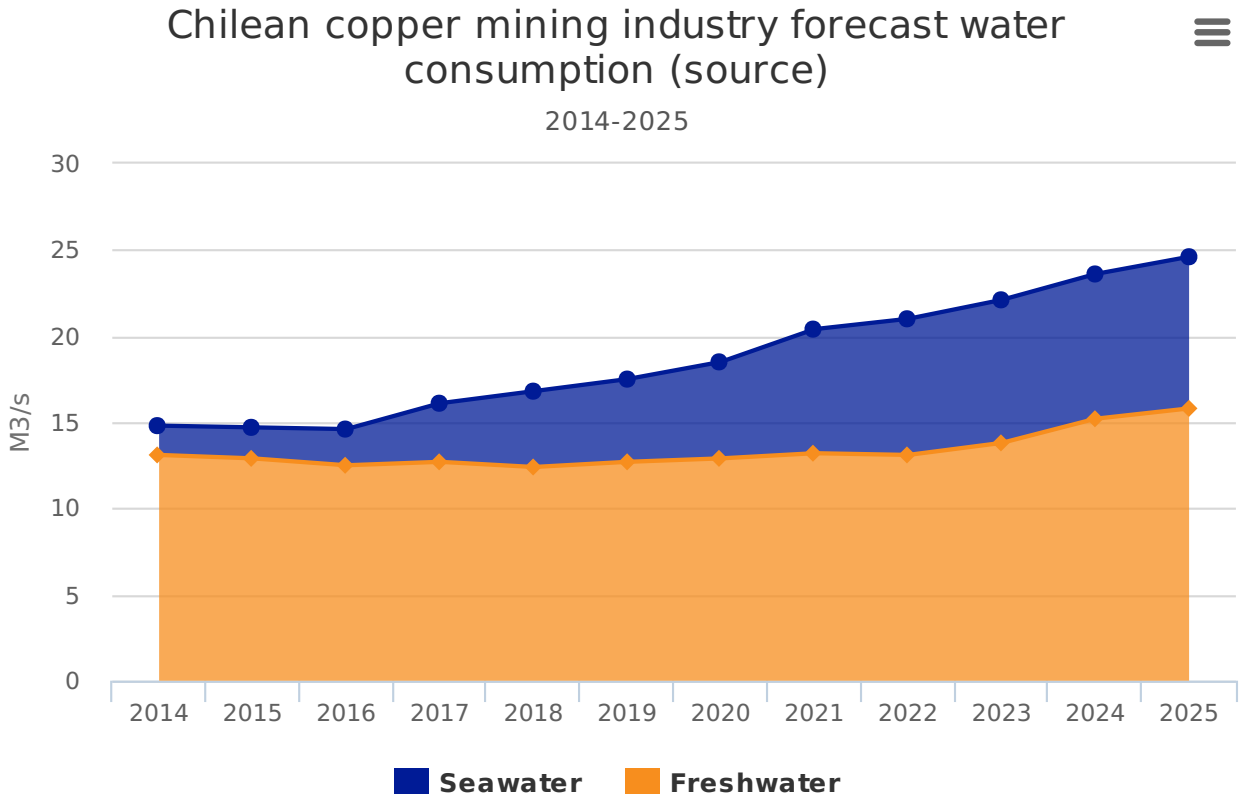
For mines, price is the most important. Energy can make up 15% to 40% of a mine's operating budget so if renewables are competitive they will naturally be considered.

Despite ubiquitous bureaucratic headaches, capital costs for renewables have dropped, especially for solar installations, up to 50% over the past decade. Renewables still carry a higher price tag on up-front capital costs compared to diesel or gas but lower overall operating costs coupled with an option to lock in fixed energy prices do produce savings.

Mining companies are also focusing on energy efficiency strategies and technology. "Savings in typical energy efficiency strategies [at mines] are usually in the range of 3%, we aren't talking 10-15%. New [mining] projects with new technology have better chances at energy efficiency," observes

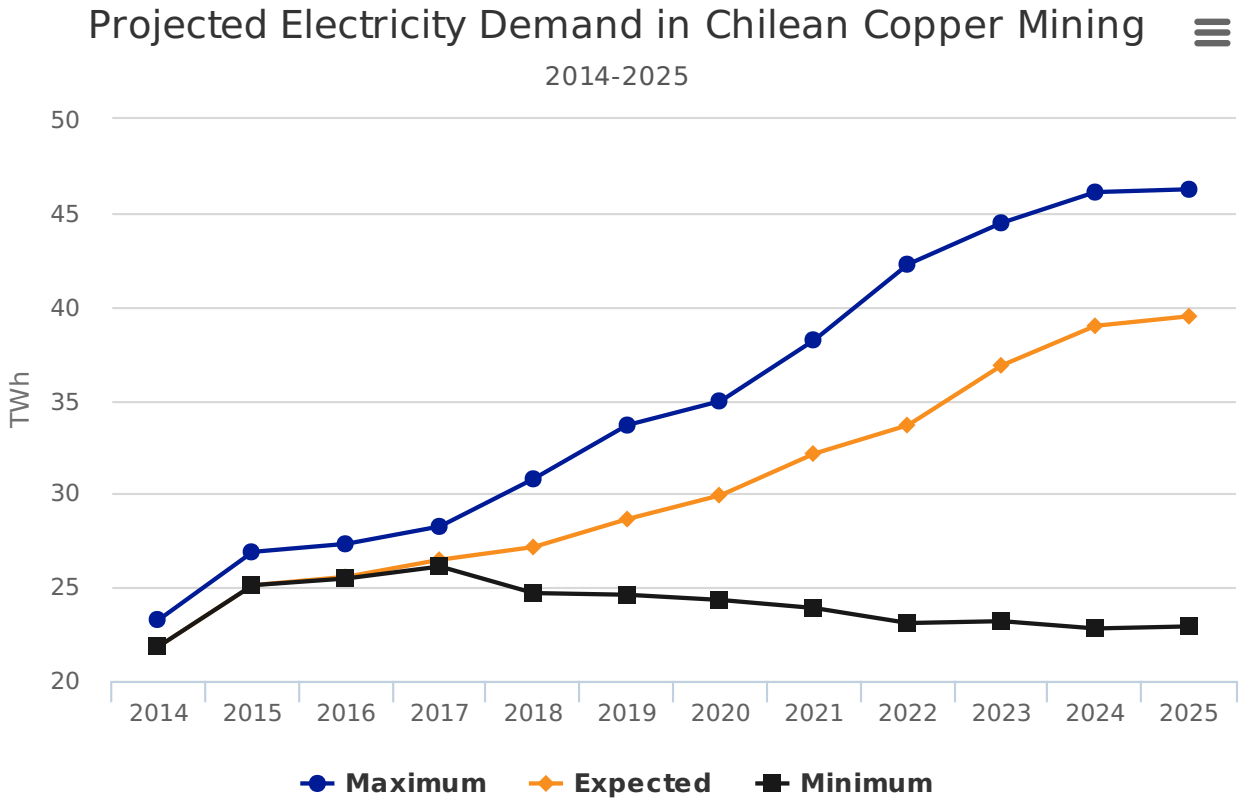
Ferruccio Medici, water, energy and copper operations manager at Anglo American.

Figure: Chilean Copper Mining Industry Forecast Water Consumption



Source: BNamericas.com with data from Cochilco

Figure: Projected Electricity Demand in Chilean Copper Mining



Source: BNamericas.com with data from Cochilco

Innovative Solutions

One way that Chile's government is trying to help the mining sector regain competitiveness is through

the newly-launched *Programa Nacional de Minería* (National Mining Program), a collaborative program between Fundación Chile, a corporation formed in 1976 by the Chilean government and BHP Billiton-Minera Escondida, and state development agency Corfo, which seeks to support innovation in service providing companies.

The program is focused on implementing what is known as *Visión 2035*, which seeks to foster the development of 250 world-class service providers in Chile that would work in conjunction with the country's mines to develop the innovations they need to stay competitive and also to export services to the global mining industry.

The director of the National Mining Program, Mauro Valdés, notes that similar initiatives to foster innovation through public-private partnerships (PPPs) have proven very successful in Australia. "There are roughly 5,000 providers working in Chile today. Australia has half of that, yet they are outperforming us," Valdés said at the LMIS 2015 conference.

Another entity engaged in research and development aimed at adding value in the mining industry is the Advanced Mining Technology Center at the University of Chile, where principal researcher Daniel Carrizo also points to the need to strengthen PPPs. The center receives grant funding and support from public and private entities and is one of only three similar institutes in Chile, said Carrizo. When comparing Chile to Australia in this area the differences are striking, but major collaborative ventures are actually taking place, something that could not have been said 15 years ago.

Truck maintenance at El Teniente. Credit: Codelco

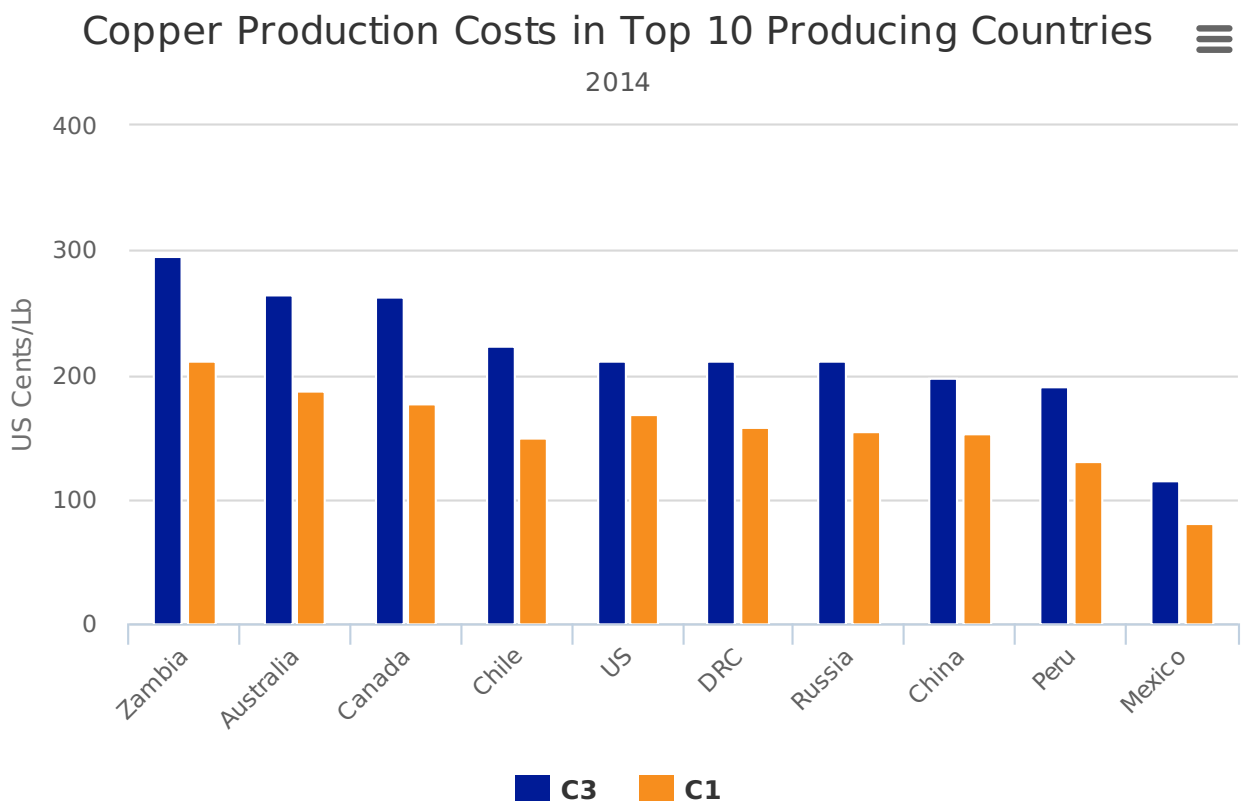
In particular, innovation to help ameliorate Chile's nagging energy quandary is an area where

BNamericas expects significant growth over the coming decade. The opportunity is there for power providers to develop non-conventional generation projects, but also for mining companies and service providers to find ways to reduce the energy required per tonne of ore processed.

Innovation and the application of information technology is also essential to improve other aspects of operating efficiency and safety at the mines themselves, from automation and the use of big data in real time, to solving more specific problems like the short life of ore-transporting conveyor belts. Two years ago a team of Chilean engineers from R&D firm SoluNova, Codelco and the University of Chile took the top prize at the 2013 Intel Global Challenge with the invention of a "Mobile Monitoring Station" jacket equipped with lifesaving technology. The young team beat out 28 other teams which had been narrowed down from over 18,000 entries, and the jacket is now being tested by Japanese telecommunications firm NTT Group.

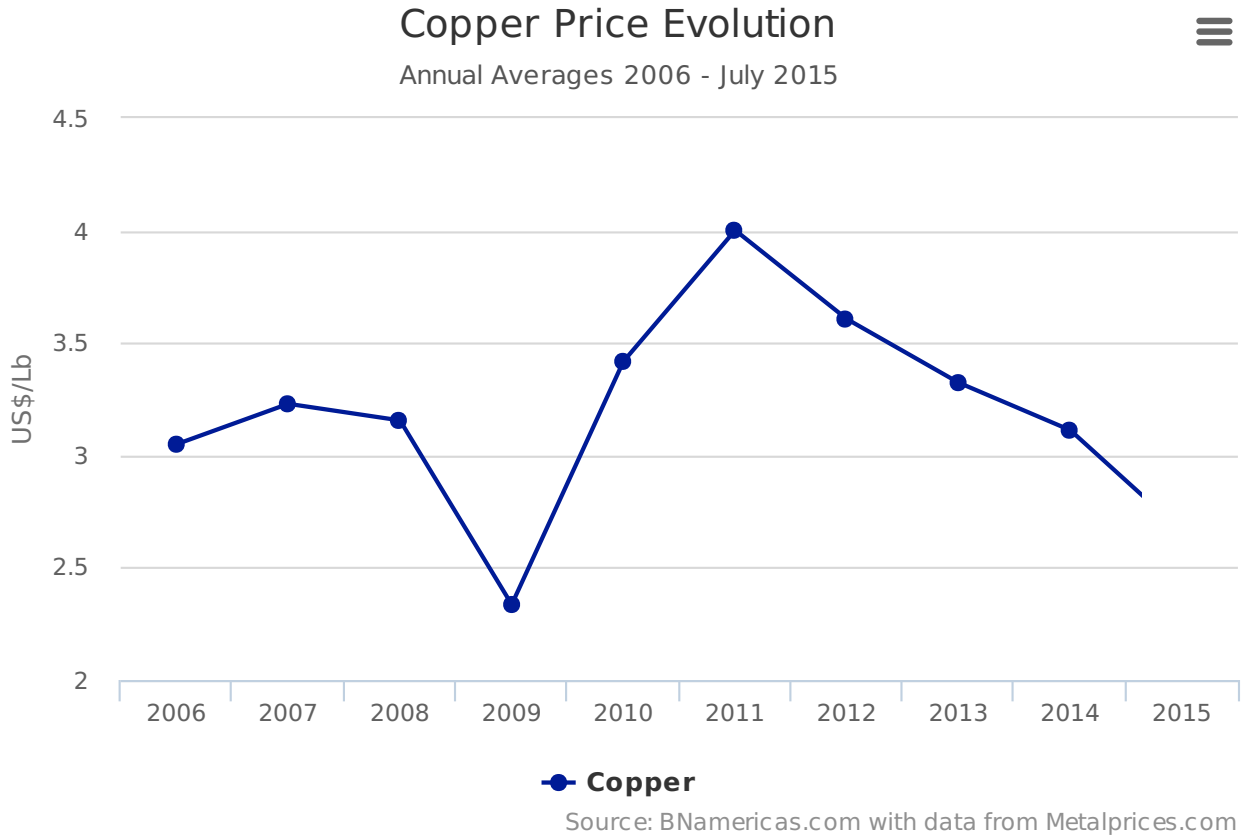
In a separate area, bioleaching microbes, colloquially known as "rock-munchers," are bacterium that when applied as an acidic solution to a heap can extract 80% to 90% of copper from the ore. The process is particularly useful in processing very low grade ore and even though the implementation and operational costs are higher compared to traditional leaching, more copper will be extracted due to the variety of ore that can be used in the process. An average of 60% to 65% of copper can be extracted utilizing conventional methods compared to 90% to 95% with bioleaching.

Figure: Copper Production Costs in Top 10 Producing Countries



Source: BNamericas.com with data from Cochilco (based on Wood Mackenzie)

Figure: Copper Price Evolution



Source: BNamericas.com with data from Metalprices.com

A Word on Gold

Because 40% of Chile's gold production comes from large copper mines, the figures illustrating the challenges to copper mining are also very relevant for the nation's yellow metal output. Another 49% of Chilean gold comes from large-scale primary gold mines, which face similar operational and cost challenges.

Chile's 2014 gold production ranked 5th in Latin America, after Peru, Mexico, Brazil and Argentina, and output levels have not varied much over the last 10 years. But Chile holds the world's fourth biggest gold reserves, after Australia, South Africa and Russia, according to USGS figures.

BNamericas forecasts at least two important gold-producing projects will come online in Chile in the next few years, the Planta Recuperadora de Metales JV between LS-Nikko Copper and Codelco and Jerónimo, a JV between Yamana Gold and Codelco. But capturing Chile's larger gold potential will depend on the development of a handful of very large-scale projects that are currently suspended, in particular Pascua Lama, Cerro Casale, El Morro and Lobo Marte.

Investment Climate

The investment outlook for the global mining industry is not rosy. Total industry capital raised in 2014 (US$230bn) registered a 15% year-on-year decline, while equity proceeds tumbled 24% (US$27bn total). Mining companies are spending less, both because they are taking a more disciplined approach and simply because less money is available.

Merger and acquisition activity has also slowed considerably, with total deal value down 49% in 2013 to US$44.6bn and the number of deals falling 23% to 544. Chile was however part of the 11 mega

deals reported in 2014 (US$1bn and greater) with Lundin Mining acquiring an 80% share of US-based Freeport-McMoRan Copper and Gold's Candelaria mine.

Chilean President Michelle Bachelet's 2014 tax reform package is set to increase the corporate income tax-rate from 20% to 25% by 2017 and shift the calculation from a current cash to an accrual basis. In essence, companies will now pay taxes for operations that occurred during the current income statement even though income might not be received until future fiscal periods. Over the long-run this is a neutral change but has the potential of generating higher tax payments during the first fiscal period.

Another notable change has been the repeal of Decree Law 600 (DL600). The repeal seeks to place local investment and foreign direct investment (FDI) on more neutral ground. DL600 provided a tax shield and its repeal will result in higher taxation on FDI, predominantly investments in the mining and energy sectors. The law allowed for easy repatriation of profit and advantageous tax treatment for reinvesting within Chile and is widely credited in the industry with helping to make possible the surge in large-scale investment by global majors seen in the last 20 years.

Chilean President Michelle Bachelet

A markedly telling survey comes from Canada's Fraser Institute, an independent research and educational organization that compiles its annual Survey of Mining Companies designed to capture participant's opinions on government policies on exploration and investment. In the survey's policy perception index, which Fraser calls a "report card" to governments on the attractiveness of their mining policies, Chile ranked 22nd in the most recent survey (out of 122 global jurisdictions), versus 8th (out of 79 jurisdictions) four years earlier. However, Chile's "best practices mineral potential" relative to other jurisdictions, as judged by survey respondents, has improved: the country ranked 6th in 2014 versus 14th in 2010, illustrating the growing gap between investors' perception of Chile's pure mineral potential and the policies that govern it.

Yet, the long-term project pipeline remains large. The state copper commission Cochilco estimates total investment in copper mining to reach some US$77.3 billion in 2015-24. The number, however, has been revised down from the previous 10-year estimate of US$105bn in 2014-23 due largely to

increasing project delays and suspensions. Of the total, 13 projects requiring combined investment of US$21.1 billion are under construction and considered "base" projects, while another 11 projects worth US$10.2 billion are considered "probable" (in construction phase but suspended, or with feasibility studies complete and environmental approval either granted or in process). The rest of the portfolio is comprised of "possible" and "potential" projects, many of which are not expected to reach production during the 10-year period, according to Cochilco.

Thirty-one primary copper projects account for 86.7% of the total projected investment and could lift Chile's annual red metal output as high as 7.7Mt by 2024 - 31% more than production in 2014 but significantly lower than the 8.5Mt projection that accompanied the previous 10-year portfolio.

Efforts are underway to make more money available to mining companies and in particular juniors engaged in generative exploration. Chile recently launched what is known as the Santiago Exchange Venture, part of the country's stock exchange.

Reverse circulation drill rig. Credit: Thinkstock

"The listed companies on the Santiago Exchange Venture are exploration projects of juniors with a reasonable background in the mining industry," explains Lucy Pamboukdjian, commercial manager at the Santiago stock exchange. Junior explorers worldwide play an active role in the discovery of new ore bodies but in Chile their participation is considerably lower than the global average. In conjunction with the TSX Venture Exchange companies can be dually listed which connects investors not only between the two countries but also investment communities in Colombia, Mexico and Peru utilizing Chile as a bridge for the Latin American Integrated Market (MILA).

Non-ferrous mining exploration spending in Chile dipped by roughly US$200mn in 2014 - about 22% -

while global exploration budgets experienced a 26% decline compared to the prior year. Chile's share of global and regional exploration has been inching upward as the country is dominated by major mining companies which have continued to explore despite the downturn.

Figure: Investment in Large-Scale Mining in Chile

Source: BNamericas.com with data from Cochilco (2015-19 forecast figures are approximate)

Socio-Environmental Issues: Turning the Page

Up until the mid-2000s opposition to mining and/or energy projects was contentious, unorganized, and rulings for the most part fell in favor of the mining companies. An institutional shift occurred however in 2010 via prompting from the OECD: an environment ministry was established and Chile found itself at a profound turning point.

HidroAysén, Barrancones, Castilla and Punta Alcalde, notable energy projects that the mining industry was intimately tied to, were already in motion when the ministry took shape and were promptly challenged before the courts between 2010 and 2014. The lone survivor of the group ended up being Punta Alcalde which has since been suspended as of January of this year.

President Bachelet's energy agenda is unequivocal in its intent to promote unconventional energy sources as well as the use of natural gas. This posture twenty years ago would have been regarded as completely unviable. However, mining and/or conventional energy-related opposition voices have become increasingly more organized and effective over the last decade, and deep socio-political changes have empowered citizens to coalesce in very strategic ways to levy demands for better standards in industrial projects.

"As a society we are still coming out of time when during the dictatorship, which ended in 1990, our collective voices were muted," says Carrizo of the University of Chile. "Constructive dialogue is now taking place and social media has really helped to advance this."

Meanwhile, traditional opposition groups are recently coming around to the position that mining is an activity that should not be obliterated and can be monitored and improved so as to lessen the environmental impact as much as possible. Social media has also helped to promote issues and dialogue in ways that were not traditionally possible.

Community Works is an Australian consulting group that partners with community development organizations to build working relationships amongst project stakeholders. In mining this is typically the mining company, government entities, citizens of the community and community advocacy groups.

"Fundamentally there is a need for relationships between the various actors in mining to become more formalized," says Steve Fisher, director of Community Works. On a global scale most large mining companies now have social responsibility initiatives in place. Codelco's Buen Vecino (Good Neighbor) program for example works to improve social integration, the quality of education and support local and cultural development. In 2008 the Chilean government recognized the International Labour Organisation Indigenous and Tribal Peoples Convention No. 169 that promotes indigenous and tribal people input and participation in mining issues directly affecting their communities.

"Good practice in Australia is for the quality of the relationship between mining companies and host or affected communities to be the leading edge of the development of the project," Fisher says. "What is often an early objective are relationships that are based on mutual respect and where both sides have incentives to make it work." Identifying and implementing the proper incentives is typically the hardest part of the process.

While increased participation from various actors can sometimes equate to onerous regulations, establishing a common direction with every player in agreement is often the only path forward for a mining project. Regulations are still ambiguous at times and community groups have the power (not so a decade ago) to dispute compliance before the court which implies time and the potential risk of revoked permits. From an investment point of view, Chile is no longer a straightforward place to do business, and this has detracted from the country's overall competitiveness.

Conclusion

Mining is down, but as other sectors such as oil have demonstrated, innovation and better operating methods typically come to fruition under pressure. The impetus to create leaner, more efficient procedures does not come at a time of sky high prices and feverish Chinese demand. With that said, the Chilean mining community and policy-makers need to take full advantage of this opportunity to coalesce in a smart and efficient manner. "It is not a curse to have resources," says Jorge Mayoral, Argentine mining minster. "What you need is clear policies in place to be able to effectively exploit those resources. That is the challenge."

Credit: AFP

Government-financed R&D is still the norm in Chile with very little connection to the business community. In most developed countries business sector R&D spending accounts for two-thirds to three-quarters of gross expenditure on R&D. In Chile this figure hovers around 45%. Even within the region, in comparison to its neighbors, Brazil and Uruguay R&D expenditures as a percentage of GDP are 1.2% and 0.9% respectively while Chile registers quite lower at 0.3%, according to CSIRO.

Rising operating costs, an uncertain energy and water supply, lower ore grades and greater uncertainty surrounding communities and permitting have placed considerable pressure on the industry. Chile clearly needs to regain its competitive advantage and the current downturn has set a collective fire beneath the sector's respective actors. While its claim to the world's largest copper reserves and reputation as a global leader to do business in mining remains intact, it is frankly tougher to do business in Chile as opposed to a decade ago. Innovation and technology have a great potential to ameliorate some of the sector's most pressing issues. Seizing this opportunity is absolutely imperative if Chile is to maintain its global position amidst flagging demand.

Intelligence Series **Mining**

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