

# GLOBAL BUSINESS REPORTS

PERU  
MINING  
2020



Pre-Release Edition

# Sustained Growth Despite Political Turbulence

*Production and investment continue to increase but easing social tensions is paramount*

Even by Latin American standards, 2019 was a tumultuous year from a political standpoint for Peru. From the suicide of former president Alan García in April, to the constitutional crisis that led to current president Martín Vizcarra dissolving the country's congress in September, the international investigation into the Odebrecht scandal continued to impact a government that has made anti-corruption its main priority. On January 26, 2020, the results of the congressional election revealed the biggest split in Peruvian history, with no party receiving more than 11% of the national vote. While the Fujimorist Popular Force,

previously the largest party in the legislature, lost the majority of its seats, parties that represent the rebellion of the interior against the metropolitan elite saw a considerable rise. Between them, FREPAP (Agricultural People's Front of Peru), a messianic cult, received the second largest share of the vote. On February 10, 2020, Minister of Energy and Mines Juan Carlos Liu, handed in his resignation after it was revealed that his company, CONASAC, had provided consulting services to Odebrecht. While Liu insisted there was no wrong-doing, this is not a good look for Peru or its mining industry.

Although the above may cause some concern, Peru has become accustomed to riding the waves of political uncertainty. Indeed, the Peruvian economy is arguably the most stable in South America and, from a country risk perspective, Peru has the best ranking of the eight traditional mining jurisdictions in Latin America, with an Emerging Markets Bond Index (EMBI) score of 1.10, ahead of Chile (1.36) in second place and Colombia (1.65) in third. "I think we have an institutionalized economy which does not want much state involvement. We are a centrist-economy of entrepreneurs which has learned to live with political turbulence,"



Photo courtesy of MMG Las Bambas

*"The mining sector contributes to between 10% and 15% of GDP, but its great importance is the macroeconomic stability it gives to the Peruvian economy. 60% of Peru's exports are from the mining industry, and it accounts for more than 50% of overall foreign investment."*



**-Claudia Cooper, President, Lima Stock Exchange (BVL)**

reflected Claudia Cooper, president of the Lima Stock Exchange (BVL) and former Minister of Finance, who credited the mining sector for giving Peru its macroeconomic stability.

Responsible for 60% of the country's exports and over 50% of foreign investment, a robust mining industry is fundamental to Peru's economic health. Fortunately, total mining investment increased for the third consecutive year in 2019, reaching US\$6.15 billion, a figure the Ministry of Energy and Mines (MINEM) optimistically expects to rise to US\$6.3 billion in 2020. Furthermore, in 2019 Peru increased its production figures for copper, lead, tin, molybdenum and iron, and remains the largest producer of gold, zinc, lead and tin in Latin America, as well as the second biggest producer of silver after Mexico.

With Minsur's Mina Justa mine on schedule to start production in 2020, and Anglo American's Quellaveco expected to produce in 2022, the short term outlook for further growth appears solid. However, with a lack of major greenfield projects on the horizon, Peru must address the two issues that threaten to derail its progress: the decreasing participation of active exploration companies and, most crucially, easing mounting social tensions and anti-mining sentiment.

## MANAGING THE SOCIAL ASPECT

On January 29, President Martín Vizcarra announced that Southern Peru's Tía María

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mining project in Arequipa will not be carried out during his government. "In this government no, there is no way," he affirmed, declaring that granting a construction permit does not necessarily imply having a social license. Although Vizcarra mentioned that other mining projects were being successfully developed, the risk that a project as high-profile as Tía María becomes the poster-child for resource development in Peru, at least in the eyes of the general public, is not something that should be taken lightly. "If you look at the outcome of the congressional election that took place on January 26th, you will notice that politicians with anti-mining rhetoric won in regions where mining is prevalent," observed Claudia Copper, who has been appointed the president of PERUMIN, the country's main mining convention and exhibition, for 2021. "Despite the mining sector giving a lot of money to the regions it operates in, there is still a lot of anger," she added, advising companies to be proactive in their engagement with communities instead of leaving the relationship building to the state.

Why does this anger exist? Augusto Cauti, Vice Minister of Mines, spoke of the lack of trust that has grown in recent years from all parties in the mining sector, and the need to present appropriate, transparent and clear information. "The mining sector is complex and not always easy to comprehend,

and the challenge is to show the benefits of the industry and how it can improve the quality of lives for local populations with something tangible rather than just rhetoric," he said, continuing: "I believe that developing projects in a low-profile manner and/or just as a good neighbor should be things of the past – the sector has to have a more visible face and involve more in alliances with people and local activities from the surrounding areas."

In an effort to engage a wider audience and move away from the model of insular industry-focused tradeshows, the Peruvian Institute of Mining Engineers (IIMP) will hold the first Mining Competitiveness and Social Sustainability Congress (CCMSS) in Lima this July. The congress aims to share the best initiatives of each of the companies attending in terms of social relationships, but more importantly, to include the public sphere, according to president of the event, Buenaventura CEO Víctor Gobitz. "It is fundamental to have ministers and regional governors attending," he stated.

This strategy is also being adopted by the Canada Peru Chamber of Commerce (CCCP), which will be leading a diverse Peruvian delegation to PDAC, before taking the regional governors to Sudbury for the chamber's Mining Mission of Innovation and Technology. "There have been conflicts in the past with certain regional governors, and that is why we consider it important

these governors can see a successful case of environmental remediation and mining coexistence such as Sudbury," explained Carla Martínez, general manager of the CCCP, who pointed to the reactivation of tourism in the Northern Ontario city as an example to follow.

The involvement of new stakeholders in the effort to build social relationships is being expanded beyond the traditional three-pronged axis of the mining company, government and community leaders, according to Gonzalo Covarrubias, general manager of WSP Peru. "Consulting firms can help from a technical approach, and can help engage NGOs, which is something WSP has been doing in Latin America," he elaborated, stressing the need for mining companies to consider how they can bring value to a community longer than the life of the project. "Mining companies cannot afford to only be experts at their core business, but must now consider the long-term social aspect from the very beginning of a project," he added.

**FULFILLING UNMATCHED GEOLOGICAL POTENTIAL**

The IIMP's "Mining Competitiveness Index" released at the last Perumin, compares the geological potential, project infrastructures, permitting processes, tax systems, and the social environment of nine leading mining countries including Chile, Peru, Colombia,

South Africa, Mexico, Australia and Canada. The aim of the study was to show what Peru's mining industry's strengths and weaknesses are, explained Luis Rivera, IIMP president, who detailed the findings: "As expected, Peru was the leader in terms of geological potential, but the country did not weigh up very well in the other categories," he revealed, noting that Australia was deemed as the most competitive mining jurisdiction, with Peru being second from last just above Colombia. "This tells us that despite the country's unmatched geological potential, we still have a significant number of things to improve on. Our goal has been to bring the debate to policy makers and find solutions to improve the country's mining sector."

What could be done to increase the country's competitiveness? For Alberto Coya, Stantec's general manager for Peru and regional manager for LatAm, one option is to invest in creating mining corridors where the government and the

*"In the north, with Conga, Michiquillay, Galeno and La Granja, we could have more than 1 million mt/y copper. A big question there is which port is going to be developed to export around 5 million tonnes of concentrates annually, perhaps Salaverry, Bayóvar, Etén or Sechura. This needs to be defined as soon as possible."*

**-Víctor Gobitz,  
CEO, Buenaventura &  
President,  
Mining Competitiveness and  
Social Sustainability Congress (CCMSS)**



community can jointly work out social issues up front. "Having the State take the role of promoting mining in certain areas would smooth the way for a good working relationship between communities and mining companies. This approach could also assist in establishing shared infrastructure needed for mines in the vicinity of the corridor," he said.

The idea of creating mining corridors or clusters, where miners can share infrastructure and service providers can

set up shop close to operations, is already being implemented in the south of Peru, most notably in Arequipa. The north, however, where agriculture is the dominant industry, has untapped geological potential that requires more infrastructure to mine economically. Of the two large copper districts in Peru, one is in the south around Arequipa, and the other in the north in Cajamarca, Piura and Chiclayo. "In both cases we are going to need private investment, but also public investment in

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infrastructure,” stated Víctor Gobitz of Buenaventura, continuing: “In the north, with Conga, Michiquillay, Galeno and La Granja, we could have more than 1 million mt/y copper. A big question there is which port is going to be developed to export around 5 million mt/y of concentrates, perhaps Salaverry, Bayóvar, Etén or Sechura. This needs to be defined as soon as possible.”

The importance of developing mining clusters was also emphasized by Ricardo Labó, executive director of the Australia Peru Chamber of Commerce (APCCI), which recently hosted an event about Peru’s mining cluster in southern Peru. “The idea is to learn from the best practices of Australia’s METS model (mining equipment, technology and services), and also from the Antofagasta cluster in Chile. The teams in charge of the cluster in Peru have already visited Australia,” explained Labó, who mentioned how the Peru-Australia Free Trade Agreement (PAFTA), which enters into force in 2020, opens up further opportunities for expanding into new business segments.

While Canada is the financial capital of the mining world, Australia is home to mining’s largest technology hub, with around 60% of the mining software used globally created in the country, according to Labó. Technology is the focus of the International Mining and

**“Gold Fields’ South American operations have the company’s lowest running costs in the world. The net profit coming out of Peru is 21% of the company’s entire profits. Our Peru business contributes approximately 310,000 ounces equivalent per year (oz eq/y), and our objective is to acquire another asset to reach a 500,000 oz eq/y, target.”**

**-Luis Rivera,  
Executive Vice President –  
Americas,  
Gold Fields**



Resources Conference (IMARC), held in October this year, and the APCCI hopes to take a larger Peruvian delegation to improve trade between the two countries and develop a knowledge transfer that can help optimize production, cut costs, and improve safety.





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# Mining Production

*A three-year period of consistent copper output gives Peru a platform to increase production in the new decade*

For the third consecutive year, Peru’s copper production stayed within a percentage point of the previous year’s figure, reaching an annual total of 2.46 million tonnes (mt/y) in 2019, a 0.8% year-on-year increase. Having experienced sharp growth between 2014 and 2017, moving from an annual average of less than 1.5 mt/y in the years previous, this period of stability preceding the new decade is expected to be followed by growth. In 2020, Southern Copper’s Toquepala expansion will see its first full year of production; Minsur’s Mina Justa operation is expected to open before the end of the year, which will add 100,000 mt/y of copper, including 58,000 mt of copper cathodes; and Anglo American’s Quellaveco will contribute 300,000 mt/y of copper starting in 2022.

Cerro Verde, the mine operated by Freeport McMoRan in Arequipa, remains the largest producer of copper in Peru, with 473,980 mt/y, followed closely by Antamina (a BHP-Glencore-Teck-Mitsubishi joint venture) with 459,219 mt/y, with Southern Peru in third with 414,394 mt/y. Las Bambas, operated by MMG, was the fourth biggest copper producer with 382,500 mt/y, almost equaling its 2018 mark despite a blockade between

February and April which prevented the transportation of concentrate from the site to the Matarani port, followed by a further blockade in September.

Edgardo Orderique, Las Bambas’ general manager of operations, commented that open dialogue with local communities continues, and noted that since Las Bambas started operations, Apurímac has been transformed from one of the poorest regions with the lowest development and growth rates, to having the leading regional growth rate. Elaborating that the Las Bambas investment projects are related to the upgrade of the molybdenum plant to achieve 100% processing, and the production of the third ball mill, which should be completed by the end of 2020, the company’s aim is to achieve sustainability in copper production. “Las Bambas hopes to achieve production of approximately 2 million mt of copper during the five year period of 2021 to 2025 – an average of 400,000 mt/y – an amount significantly above the levels forecast before production started,” he said.

In the medium to long term, ambitions to close the production gap with Chile look rather distant. Although Chilean production

fell by 0.8% in 2019 on the back of declining ore grades and financial issues at state giant Codelco, catching up to Chile’s total of 5.32 mt/y would require numerous district scale projects to move into production. The Ministry of Energy and Mines (MEM) has predicted an increase in Peru’s copper output of 27% by 2022, but progress will be partly dependent on the ironing out of social issues that have interrupted production at Las Bambas and delayed projects such as Southern Peru’s Tía María and Southern Peaks Mining’s Ariana.

“Ariana is currently in a state of limbo and what is happening is not only a threat for the Ariana project, but for all new mining operations in Peru,” stated Adolfo Vera, Southern Peaks’ president and CEO, who clarified that, while there is no local opposition to Ariana, an NGO contesting the project caused Southern Peaks to reduce the rate of construction whilst awaiting a decision from the constitutional court. Underlining the role the mining industry plays in the country’s economic development, Vera continued: “This source of income should be protected instead of fought against. There is an ignorance about what the mining industry



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is doing, and I believe that the government should step up to educate and inform the country of the importance of mining.”

Despite the delay to its Ariana project, which is 18 months away from production, Southern Peaks made progress in 2019 by reinterpreting the geology of its Condestable flagship asset, increasing the life of mine significantly. “In 2019, we were able to multiply resources by 2.4 times and we are expecting to see even larger multiplier in 2020. As soon as we obtain the permit, we will start to further expand the capacity at Condestable in light of the new size of the resource and reserve,” explained Vera, who added that the company hopes to have completed a feasibility study on the expansion of Condestable by 2021.

Having already agreed a loan contract of approximately US\$50 million with Scotiabank Peru, which will fully fund the Condestable expansion, Southern Peaks expects a 20% increase in processing capacity will translate into a 20% increase in production.

With a potential IPO in Toronto on the horizon, something that had been planned for 2018 but shelved to focus on increasing reserves and waiting for the copper market to improve, Vera mentioned that Southern Peaks will also start to look for additional assets in Peru and Latin America in the near future to expand its portfolio.

The beginning of 2020 was a rollercoaster for the copper market, as the signing of a “phase one” trade agreement between the US and China on January 15th pushed the price to a high of US\$2.88/lb. However, a Chinese dynamic of a different kind conspired to send the red metal

crashing to a low of US\$2.50/lb by the end of the month, a 13% drop in merely two weeks in reaction to the escalating coronavirus outbreak. While China’s overwhelming influence on the copper price is worrying, the current dip seems like an artificial low. The fundamentals of the base metal key in the electrification process are bullish, both from the standpoint of infrastructure development in Asia and Africa, and the undeniable proliferation of electric vehicles.

**PRECIOUS METALS**

From a price perspective, 2019 was an outstanding year for precious metals producers and, in January 2020, gold broke the US\$1,600/oz barrier, reaching a seven-year high. Factors such as global political

*“In 2019, Southern Peaks was focused on reinterpreting the entire geology of Condestable, and we have been able to increase the life of mine significantly. We were able to multiply resources by 2.4 times and we are expecting to see an even larger multiplier in 2020.”*

**-Adolfo Vera,  
President & CEO,  
Southern Peaks Mining**



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instability from the US feud with Iran and the escalating coronavirus outbreak, in addition to a fractured European Union, have seen investors and central banks rushing towards the safe-haven metal. In Peru, gold production declined for the fourth consecutive year in 2019, with an output of 4.13 million ounces (Moz/y), a 9.94% decline from 2018. Likewise, silver saw a 7.24% decrease from 133.8 Moz/y to 124.1 Moz/y, its third consecutive year on a downward trend.

Buenaventura (BVN) is Peru's biggest producer of both gold and silver, with a wide array of its own operations and a stake in Yanacocha (Peru's largest gold mine operated by Newmont). Víctor Gobitz, Buenaventura's CEO, acknowledged that the downward trend in gold production and diversification into base metals is being reflected in the company's portfolio, with production falling at Orcopampa and La Zanja, and Yanacocha's production currently stable at around 0.5 Moz/y but expected to decrease in the coming years. "So, in the medium term, San Gabriel will be a key project for us as it will be a breaking point; while Yanacocha, Tantahuatay and La Zanja will become gold-copper producers and not just gold producers," he explained.

When asked how base metals are playing an increasing role in Buenaventura's production profile, Gobitz emphasized the idea that Buenaventura should be a long-lasting investment vehicle with consistent financial results, which can be achieved through diversification. "In this respect, it is easier to find larger deposits in

**"Las Bambas hopes to achieve production of approximately 2 million tonnes of copper between 2021 and 2025 – an average of 400,000 mt/y – an amount significantly above the levels estimated before production started."**

**-Edgardo Orderique,  
General Manager –  
Operations,  
MMG-Las Bambas**



base metals than in precious metals. We will always have a big focus on gold and silver, but industrial metals are becoming increasingly important," he said.

Evidence of this came in December 2019, as Buenaventura announced a strategic investment into Canadian base metals junior Tinka Resources.

Buenaventura's debottlenecking process across its four main operations continued in 2019; the simplification of the metallurgical process and optimization of mine preparation have seen positive results at Tambomayo, and improved efficiency in the underground mine at Uchucchacua resulted in significant cost savings. "Orcopampa is a different case, because we have resized the operation and a big focus now is on the exploration front. Finally, at Marcapunta we should reap the benefits of the program during 2020," concluded Gobitz.

Gold Fields continued its growth in South America in 2019 with the ramping up of its Salares Norte project in Chile, as well as the completion of a feasibility study at its Cerro Corona mine in Cajamarca, where mine life has been extended to 2030 – an extension of seven years. With a scoping study set to be performed in 2020 aimed at further extending the LOM at Cerro Corona to 2034, Luis Rivera, Gold Fields' executive vice president of the Americas region, gave an overview of the milestones achieved by the company and its growth ambitions in Peru: "Gold Fields' South American operations have the company's lowest running costs in the world. The net profit coming out of Peru is 21% of the company's entire profits. Our Peru business contributes approximately 310,000 gold equivalent ounces per year (oz Au eq/y), and our objective is to acquire another asset to reach a 500,000 oz Au eq/y target."

In December 2019, Gold Fields became the first open pit mining company in Peru to obtain the ISO 45001:2018 certification for its Cerro Corona operation, awarded due to its emphasis on safety. Elaborating on Gold Fields' priorities moving forward, Rivera added that key areas of focus include water stewardship, mine closure and the reduction of carbon emissions and energy usage, something emphasized by Gold Fields' global CEO Nick Holland at the World Energy & Mines Congress in Toronto in December 2019. "All of our operations are certified to the ISO 14001 standard and are fully

compliant with the International Cyanide Management Code. For example, Gold Fields does not use mercury for the beneficiation of gold or in any of its processes," concluded Rivera.

**ZINC**

Zinc production in Peru went down by 4.39% in 2019, and the base metal had a challenging year after reaching a five year high of over US\$1.60/lb in early 2018, dropping below the US\$1/lb mark in January 2020.

Diversified metals producer Nexa Resources Peru is expecting that operational performance will partially offset market-related factors, according to CEO Ricardo Porto, who stated that Peru is the Brazilian company's main growth platform. At Nexa's Pasco Mining Complex, zinc production at the El Porvenir mine is estimated to increase 3% in 2020 due to better recovery performance; lead production is estimated to increase 15%; and silver production is also expected to increase. At the Atacocha mine, zinc production is estimated to increase by 6kt, and at Cerro Lindo, assuming a total throughput for the mine of approximately 7.4Mt, average zinc production is estimated to be between 92-110kt over the next three years.

Cerro Lindo is one of the recent success stories of project development in Peru, and part of this success has been due to Nexa's proactive approach to community engagement, exemplified by its recent alliance of cooperation to favor communities, established

**"At the El Porvenir mine in the Pasco Mining Complex, zinc production at the midpoint of the three-year guidance range is estimated to increase 3% compared to 2019 due to better recovery performance; lead production, assuming mid-range production, is estimated to increase 15% compared to 2019, a further 10% in 2021 over 2020, and a further 5% in 2022 over 2021."**

**-Ricardo Porto,  
CEO,  
Nexa Resources Peru**



with the United Nations Development Program (UNDP). "In Nexa we are building the mining of the future, every day," declared Porto, emphasizing his company's role as a local player who can ignite social transformation. "This alliance with the UNDP inspired by a shared purpose, aiming to support collaborative local sustainability projects framed in the UN Sustainable Development Goals 2030."

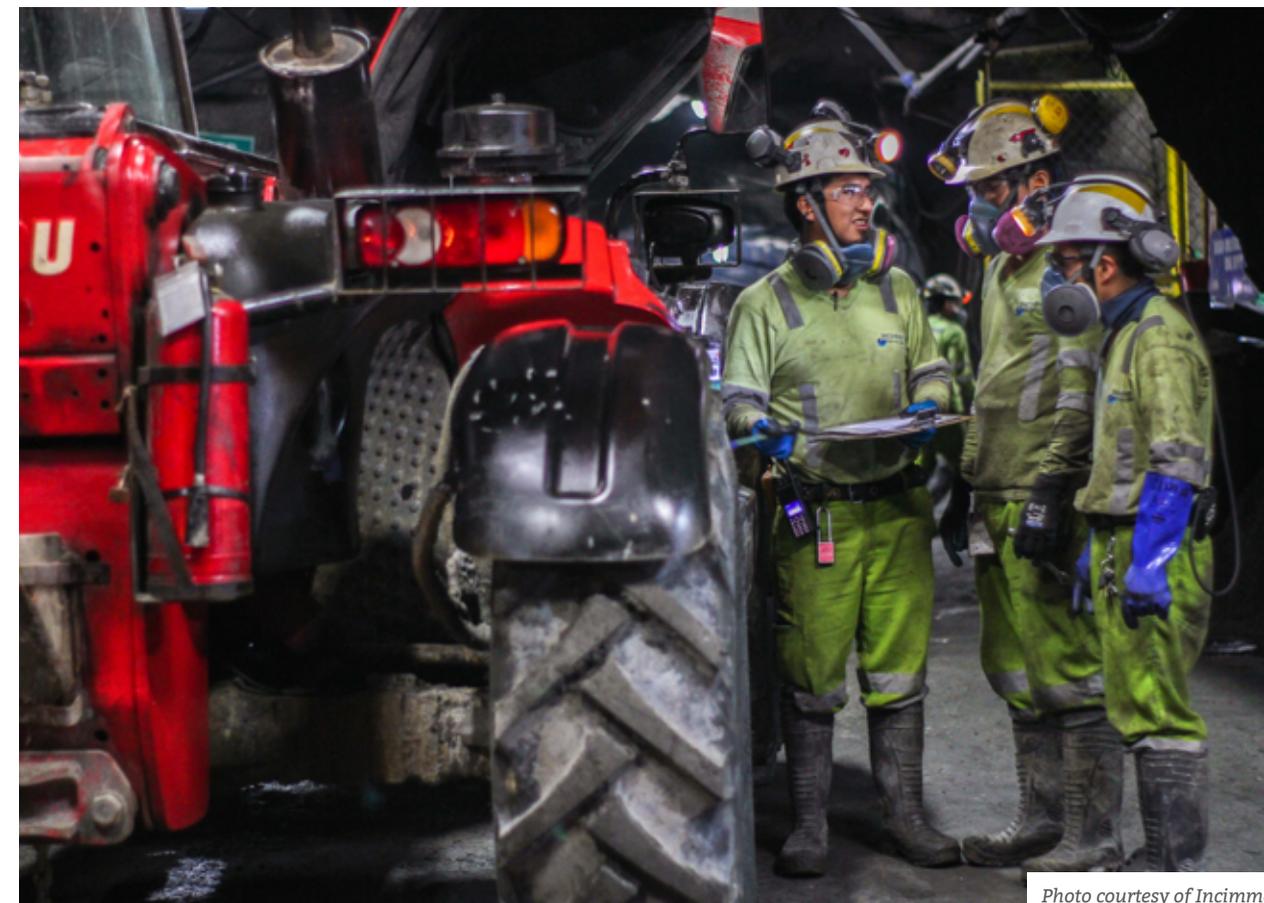
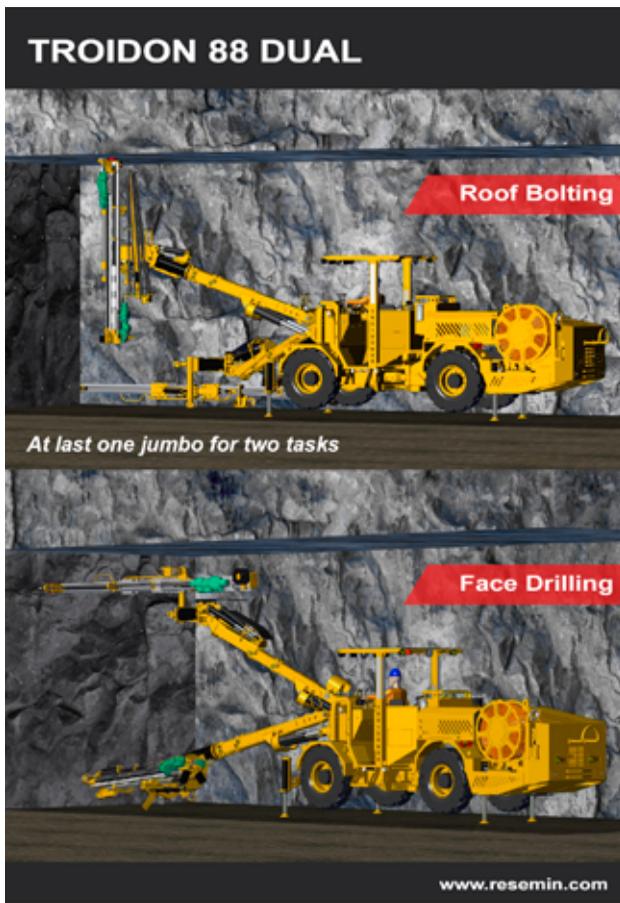
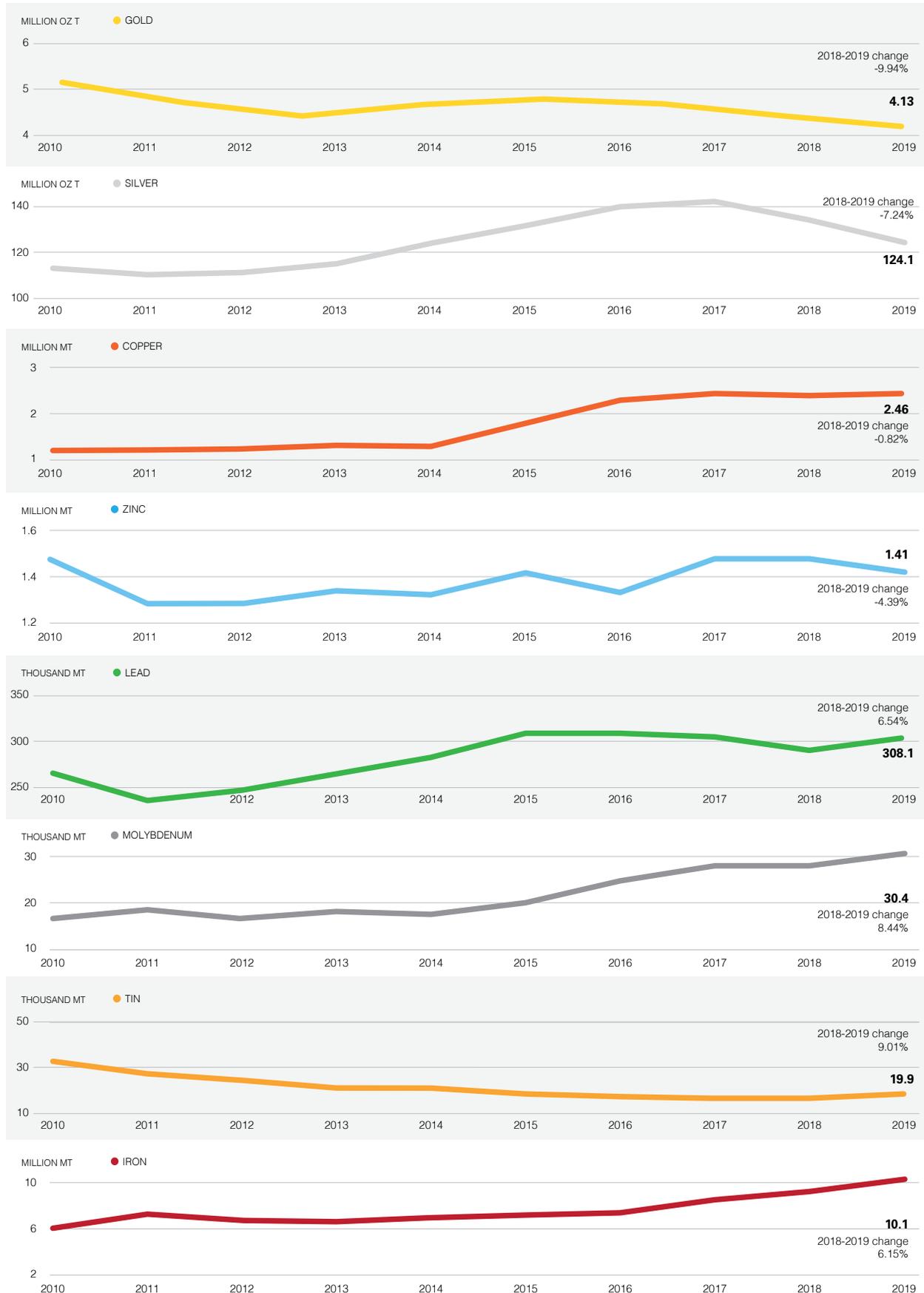


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**PERU, A DIVERSIFIED METALS PRODUCER**

Source: Ministry Of Energy And Mines / GBR



*"The economy is open and the constitution welcomes both local and international investment that can contribute to the development of Peru's diverse resources and, above all, its people."*



**Augusto F. Cauti**  
Vice Minister of Mines,  
Ministry Of  
Energy And Mines (MINEM)  
– Government of Peru

more than US\$2 billion, Corani for around US\$570 million, and Corcohuayco for more than US\$500 million. We know there are some projects that face challenges to be developed, but many others are advancing – such as Quellaveco with construction advances over 45%, and Mina Justa that should start production by the end of 2020.

**What is the vision of the Ministry of Energy and Mines (MINEM) for 2020?**

The aim of the government is to promote the sustainable development of mining, not just from an economic standpoint, but also environmentally and socially. In 2019, over US\$6.15 billion was invested into Peru's mining sector, and we expect this to increase to around US\$6.3 billion in 2020. This would equate to the 4th consecutive year of growth, which gives continuity to the country in terms of GDP, to which mining contributes over 10%, as well as approximately 60% of the country's exports. This year, increasing investment in exploration is a particularly key objective.

In 2019, Peru increased its production figures for copper, lead, tin, molybdenum and iron, and we remain the number one producer of gold, zinc, lead and tin in Latin America, as well as the second biggest producer worldwide of copper and silver. By 2022, we expect copper production to increase by 27%, and gold production to rise by 12% approx.

**What could be done to stimulate exploration?**

Even though the amount of exploration investment was not what we expected or hoped for in 2019, Peru still had the 5th biggest exploration budget in the world with US\$609.7 million, behind only Canada, Australia, the USA and Mexico. Because of Peru's unrivalled geological potential and mining tradition we are still a highly attractive destination for exploration.

To stimulate exploration, on December 27th 2019 we granted a decree of urgency to give the definitive devolution of VAT for the next three years. Furthermore, we reinstated legislation that allows companies that invest large amounts in the country to perform accounting in US dollars. We are planning to review more adjustments to specific legislation to see how we can expedite permitting processes in general, whilst bearing in mind the highest environmental and safety standards.

**How is Peru's project pipeline shaping up after Mina Justa and Quellaveco?**

For 2020 there are six projects in the pipeline to start development, including Yanacocha sulphides which accounts for

**What can the mining industry do to help its public image in Peru?**

The mining sector is complex and not always easy to comprehend, and the challenge is to show the benefits of the industry and how it can improve the quality of lives for local populations with something tangible rather than just rhetoric. I believe that developing projects in a low-profile manner and/or just as a good neighbor should be things of the past – the sector has to have a more visible face and involve more in alliances with people and local activities from the surrounding areas.

*"I believe that developing projects in a low-profile manner and/or just as a good neighbor should be things of the past – the sector has to have a more visible face and involve more in alliances with people and local activities from the surrounding areas."*

**Apart from its geological endowment, what do you think makes Peru an attractive destination for mining investment?**

Compared to many countries around Latin America, and indeed other mining countries worldwide, Peru is still in a good condition from a macroeconomic point of view. In 2019, we grew by 2.3% despite the political changes that took place. We hear that investment has been migrating to safer jurisdictions, and it is important to point out that Peru has an Emerging Markets Bond Index (EMBI) country risk rating of 1.10, the best of all of the other mining-focused countries in Latin America, according to data released by JP Morgan on January 6, 2020.

Last but not least, Peru is a country with a rich mining tradition with competitive prices for energy, electricity and a skilled mining labor force. The economy is open and the constitution welcomes both local and international investment that can contribute to the development of Peru's diverse resources and, above all, its people.

# Junior Exploration

*2019 was a challenging year for Peru's junior segment, but investments by producers point to a more promising 2020*

The difficulties experienced by the junior community in 2019 were not confined to Peru. With the notable exception of Australia, exploration expenditures decreased in 2019 in five of the six countries with the biggest global exploration budgets. According to the S&P Market Intelligence World Exploration Trends report from 2019, Peru received 6.3% of global investment in non-ferrous metal exploration in 2018 (US\$609.7 million), putting it in fifth spot behind Canada, Australia, the US and Mexico, and ahead of and Chile. Looking at the Ministry of Energy and Mines (MEM) statistics, although investment into Peru's mining industry increased by over 20% in 2019, exploration was the one area which went down, from US\$413 million in 2018 to US\$357 million in 2019 (figures from Minem) – a 13.5% decrease.

This has been reflected in the membership of the Canada Peru Chamber of Commerce (CCCP), according to general manager Carla Martínez, with the number of junior participants decreasing in recent years. "To reignite the interest of the junior mining community, permitting and authorization times must be reduced," she affirmed. This sentiment was shared by Paul Murphy, manager of the South America region for technical consulting firm Mining Plus, who has noticed the global trend of financing migrating towards jurisdictions that are considered safer investment prospects. "Peru is just too well endowed geologically to ever be ignored by explorers, but in the current climate where drill permits are taking a considerable amount of time to be approved and with ongoing social challenges,

this is testing the friendship between the jurisdiction and juniors," he said, adding that Peru has to be aggressive in ironing out corruption to attract more investment into its exploration sector.

Aware of the challenges facing junior companies, stimulating exploration is a key objective in 2020 for the government, according to Vice Minister of Mines, Augusto Cauti, who pointed to the decree of urgency enacted on December 27th 2019, that grants the definitive rebate of VAT for the next three years. "Furthermore, we reinstated legislation that allows companies that invest large amounts in the country to perform accounting in US dollars," added Cauti, commenting that MINEM is planning to review more adjustments to specific legislation to see how the permitting processes can be expedited.

Another avenue to stimulate exploration is to increase opportunities for investment, and at a press conference for the foreign media on January 16th 2020, Juan Carlos Liu, Minister of Energy and Mines at the time, stated he was confident Peru would have regulations for the exploitation of lithium ready within 2020. This development is good news for Plateau Energy Metals, which, in February 2020, announced a positive PEA for its Falchani deposit in Puno. The PEA indicates a scalable, long mine life battery grade lithium chemical project spanning 33 years, and Benchmark Mineral Intelligence (BMI) rates the project in the low second quartile of operating costs. Liu told the foreign press that Peru has sought international assistance to develop the legal framework for lithium exploitation,

following on from the government's announcement in 2019 that it was receiving support from the United States Agency for International Development (USAID) in drawing up legislation. With shares in lithium producers trending upwards in February as the sector rides the wave of investor enthusiasm for electric vehicle pioneer Tesla, and robust production from the neighboring "lithium triangle" located in Chile, Bolivia and Argentina, the opening up of this new sub-sector in Peru is a tantalizing prospect.

Drilling permits and exploration licenses mean little to juniors without access to capital, and in this respect, the Canadian money markets hold significant influence. In early 2019, the Toronto Stock Exchange (TSX) and TSX Venture Exchange (TSXV) made a strategic decision to establish a full time presence in Lima to explore new opportunities across South America. From a mining standpoint, Latin America represents 23% of mining issuers on TSXV, second only to Canada with 45%. The man in charge of leading this growth is Guillaume

*"We chose Peru as a base because it is the most important South American mining market for our Exchanges. In Peru, there are 57 companies listed on TSX and TSXV that are active in South America with 135 mining properties."*

**- Guillaume Légaré,  
Head – South America,  
Toronto Stock Exchange (TSX)  
and TSX Venture Exchange  
(TSXV)**



the reasons for choosing Lima as a base: "We chose Peru as a base because it is the most important South American mining market for



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our Exchanges. In Peru, there are 57 companies listed on TSX and TSXV that are active in South America with 135 mining properties.” With a goal to support more local management teams access the Toronto exchanges’ two-tiered ecosystem, Légaré noted that there are different channels available for accessing capital other than a traditional IPO. One option is the Capital Pool Company (CPC) program, which introduces experienced investors to entrepreneurs whose growth and development-stage companies require capital and public company management expertise. “There are a number of CPC founders looking for mining opportunities in the region; We want to bring investment opportunities from LatAm to these founders, and better communicate the different options for raising capital to potential issuers,” he explained.

*“Regulus has already demonstrated a sizeable resource with a great opportunity for expansion. We have the security of a solid investment premise on the known deposit, but also the benefit of additional exploration upside.”*

**-John Black,  
CEO and Director,  
Regulus Resources**



**GOLD PRODUCERS INVEST IN BASE METALS**

In 2018, the cannabis and cryptocurrency boom in Canada saw risk-capital leave the mining sector. Why then, in 2019, as the cannabis and crypto-bubbles burst and metals prices continued to rise, did equity not flood back to the market? One reason, according to Ryan Matthieson, head of investment banking at Haywood Securities, is the remarkable performance of the precious metals producers, with the likes of Wesdome Gold Mines and Kirkland Lake Gold trading at eye catching multiples. “In the eyes of the generalist investor it is

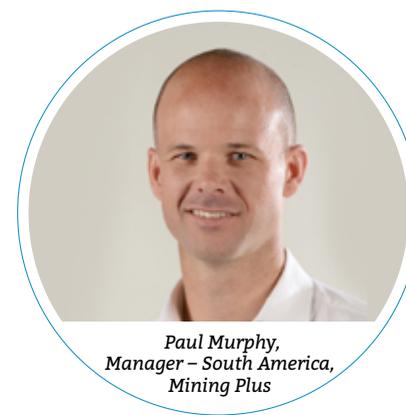
riskier to pick a micro-cap that could double when some of these intermediates have been doubling,” he explained. Matthieson went on to explain, however, that the current discrepancy between producers and juniors is not sustainable, and the movements of the larger players investing in exploration companies bode well for 2020. This trend is evident in Peru, with precious metals producers investing in base metal juniors to diversify their portfolios. With gold-focused industry heavyweights such as Barrick CEO Mark Bristow declaring he believes copper will be “the most-strategic



**Tom Larsen,  
CEO,  
Eloro Resources**



**David Stein,  
President,  
Kuya Silver**



**Paul Murphy,  
Manager – South America,  
Mining Plus**

metal on this planet” in a decade, and a lack of undeveloped gold assets large enough to satisfy big producers, copper offers the upside linked to the impending electrification movement, as well as the type of assets that guarantee long-term production. In May 2019, Gold Fields completed a C\$8 million investment for a 16% stake in Chakana Copper. The investment correlates with the company’s decision to reallocate a budget for exploration and M&A in the Americas in 2019, according to Luis Rivera, Gold Fields’ executive vice president for the region. Commenting on the company’s new strategy, Rivera explained: “We have always been focused on gold, but are also starting to expand our interest into copper in the Americas, considering the geological potential.”

The biggest precious metals producer in Peru, Buenaventura, also made a strategic investment into a base metals junior in 2019, announcing in December the purchase of over 65 million common shares of Tinka Resources for gross proceeds of C\$16 million, equating to a 19.3% stake in the Vancouver-based company. Victor Gobitz, Buenaventura’s CEO, elaborated on the rationale behind the investment: “The company’s vision is to have assets that can be in production for at least 10 years. Ayawilca is a high-grade zinc project, equidistantly located between El Brocal and Uchucchacua. In both plants we have the capacity to produce lead and zinc concentrates. Therefore, it makes sense to think that Ayawilca, rather than being developed as a standalone project, could be

developed as a satellite mine to feed those plants.”

**COPPER**

Considering the scarcity of sizeable junior copper assets globally, a name frequently brought up as a buyout candidate is Regulus Resources, whose AntaKori project has produced five of the top 20 copper intercepts reported worldwide over the last two years with mineralization close to surface. John Black, Regulus’ CEO, provided an update on the company’s phase II drill program, where approximately 16,000 m of what is anticipated to be a 25,000 m phase II program has been completed. Mentioning that the focus of the phase II drilling program has been to extend the mineralization, mostly to the north of the project, Black noted that the

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resource already announced has given Regulus a strong foundation to build upon, with 250 million mt of 0.48% copper and 0.29 g/mt gold in the indicated category and 267 million mt of 0.41% copper and 0.26 g/mt gold in the inferred category.

The Regulus management team has already had success with Antares Minerals, which was sold to First Quantum for CS460 million in 2010, and Black believes they have the same scale of project or better with AntaKori. "Considering its potential size and immediate proximity to operating mines, I believe that AntaKori could logically become part of a joint venture between a number of different parties to consolidate the district and establish a large long-life copper-gold mine," he said.

"We have already demonstrated a sizeable resource with great opportunity for expansion. We have the security of a solid investment premise on the known deposit, but also the benefit of additional exploration upside," concluded Black.

Regulus' expects to complete the phase II program in mid-2020, which will allow for an updated resource by the end of 2020.

Another of the Canadian juniors active in Peru, Chakana Copper, built upon the success of the investment received from Gold Fields in May 2019, starting a 20,000 m drill program at its Soledad project in June 2019, with the aim of testing numerous targets and completing definition drilling on additional mineralized breccia pipes, according to president and CEO, David Kelley. After drilling 5,700 m of the program in 2019, Chakana made the decision to halt drilling and wait until an expansion of its drill permit had been granted to allow access to other parts of the property that have not been drilled yet. With drilling expected to recommence in Q2 2020, Kelley spoke of how Soledad is evolving from a mineralization standpoint: "Looking at the value of what we have drilled up to date, approximately 60% sits in gold and silver and the remaining 40% sits in copper. I believe as we go deeper, copper will become more dominant."

When asked about the potential scale of the project, Kelley outlined Chakana's initial target for publishing a resource is 10 million mt, which will allow for investor confidence and put the company in a position to raise money to continue aggressive exploration. "There are approximately 40 to 50 breccia pipes. Each breccia pipe varies in size and we have confirmed that the breccias become bigger at depth. We have never seen the bottom of a breccia pipe, even though our deepest breccia intercept is over 700 m."



*"Looking at the value of what we have drilled at Soledad to date, approximately 60% sits in gold and silver and the remaining 40% sits in copper. I believe as we go deeper, copper will become more dominant."*

**-David Kelley,  
President and CEO,  
Chakana Copper**



#### PRECIOUS METALS

One of the issues since the decentralization process that transferred more power to regional authorities in Peru is the risk of individuals with an anti-mining stance opposing permits. This was the case for Eloro Resources, whose number one target for its La Victoria gold and silver asset is located in the San Markito area close to the Pallasca community. Awaiting a maiden drilling campaign in 2018, the permission to attain surface rights was not granted by the Pallasca community president at the time, despite receiving the backing of the vast majority of the community, according to CEO Tom Larsen. This led to Eloro stopping activities at La Victoria in December 2018 and turning its attention to the recently acquired Iska Iska project in Bolivia, which caused the company's share price to double from December 2018 to January 2019. When questioned, Larsen reinforced Eloro's commitment to Peru, revealing that a new mining-friendly president and committee in Pallasca was elected in December 2019. "We hope to restart exploration at La Victoria by April 2020. We expect to attain the surface rights in the very near future, and have all other permits in place."

While Eloro's continued intention to develop its Peruvian asset is encouraging, the positive market reaction it received in acquiring a project in a different jurisdiction is an illustration that Peru cannot rest on its laurels, and geological potential must be backed up by streamlined permitting procedures.

On the silver side, private company Kuya Silver acquired the past-producing Bethania silver mine in 2017, and has since received investment from the likes of Eric Sprott in an effort to get the mine up and running by Q1 2021. Kuya's all-in costs to acquire, expand and restart the mine will be US\$18 to 20 million, according to president David Stein, who elaborated on his company's strategy to remain private for the time being: "When I first struck the deal to acquire Bethania we were in a bear market. At the time, we thought that staying private until production we could go public as a junior producer, something like Excellon Resources, which would be much more attractive for our investors."

However, with silver traditionally outperforming gold during a bull market, and the outlook for the precious metal with industrial qualities bullish in 2020, Kuya is remaining pragmatic with regard to a potential IPO. "We are conscious that if silver makes a run we may have to act more quickly and we are lining things up to be ready to go public in such a market," concluded Stein.

*"Despite the country's unmatched geological potential, we still have a significant number of things to improve on."*



**Luis Rivera**  
President,  
Instituto de Ingenieros de  
Minas del Peru (IIMP)

#### What have been IIMP's main achievements during your two-year mandate as president?

Over the last two years, IIMP has focused on restructuring its strategic view. We decided to establish four main pillars of activities. The first pillar is our members, as the IIMP's mandate comes from its members. Secondly, we have a focus on continuously strengthening our institution to keep finances in the black. The third pillar is the academy, as part of our foundational mandate is a commitment to continuously put efforts into education. Lastly, we have a focus on the industry itself and promoting the mining sector.

Within these four pillars, we have specific objectives. The IIMP needs to continue to increase its memberships. Currently, we have approximately 2,000 members, whereas in Peru there are about 200,000 direct mining workers. To attract more members we have increased our social networking activities and reinforced our social media pages. We have also relaunched our services to our members. In terms of the institution, we have created a budget concept and metrics to deliver on. We utilized practices normally used in private mining activities and now we have a strategy, budget and metrics to deliver on for the next six years. We also collaborate with universities by providing relevant industry and educational information from the academy. Lastly, we are very active in the industry and continue to do research which will benefit our members, the industry and the country. Research studies that we have published include "Current and Potential Benefits of Mining in Peru" and "Perumin 2019's Index of Mining Competitiveness".

#### Can you elaborate on the findings from the IIMP's Indicator of Competitiveness study?

In our "Perumin 2019's Index of Mining Competitiveness" study, we compared geological potential, project infrastructures, permitting processes, tax systems, and the social environment of leading mining countries including Chile, Peru, Colombia, South Africa, Mexico, Australia and Canada. The idea was to show what Peru's mining industry's strengths and weaknesses are. As expected, Peru was the leader in terms of geological potential,

but the country did not weigh up very well in the other categories. Overall, Australia was deemed as the most competitive mining jurisdiction, with Peru being second from last just above Colombia. This tells us that despite the country's unmatched geological potential, we still have a significant number of things to improve on. Our goal has been to bring the debate to policy makers and find solutions to improve the country's mining sector.

#### How does the IIMP engage with the government and the public in reaching a common goal?

Over the last three years, the IIMP has been invited to several events and committees where we have the opportunity to participate in the public arena. We were part of a committee where the Minister of Mining wanted to establish a vision for the mining industry moving forward. We are also part of a committee, delegated by the President, which has the goal to improve the mining legislation and regulations. IIMP will propose solutions and ideas to the government on how we can improve the mining industry's weaknesses. We take on the responsibility to educate and thus we invite journalists, academy members and industry to attend presentations and seminars. IIMP is a member of the ICMM and having access to their database and knowledge has helped us significantly with our mining index.

*"Politically, 2020 will be a big year for Peru. In addition to parliamentary elections in January 2020 and presidential elections the following year, the country is celebrating 200 years of independence in 2021. A significant amount of the country's objectives are based on the 200-year independence anniversary, and Perumin 35 will also be within this context."*

#### How much do you think politics will impact Peru's mining industry in 2020?

Politically, 2020 will be a big year for Peru. In addition to parliamentary elections in January 2020 and presidential elections the following year, the country is celebrating 200 years of independence in 2021. A significant amount of the country's objectives are based on the 200-year independence anniversary, and Perumin 35 will also be within this context.

# Engineering, Construction & Consulting

*Growth through consolidation, brownfields projects and environmental services*

On January 2nd 2019, the first act in a wave of consolidation that would define the mining industry took place as Barrick merged with Randgold, followed by Newmont's acquisition of Goldcorp in April. Consolidation was not confined to the precious metals producers, as some of the largest EPCM and consulting houses ramped up M&A activities to bolster their service offerings with clients increasingly looking for a one-stop-shop instead of outsourcing to multiple suppliers. In April 2019, Australian EPCM giant WorleyParsons announced the completion of the US\$3.2 billion acquisition of Jacobs ECR (Energy, Chemicals and Resources) division, rebranding to "Worley" in the wake of the transaction. On the consulting side, ERM (Environmental Resources Management) acquired CSA Global in July, a coming together of mining and environmental expertise – another of

the prevalent themes in recent years – as environmental social governance (ESG) has moved quickly to the forefront of strategy for mining companies.

Canadian engineering and consultancy firm WSP was particularly active in the M&A space in 2019, completing nine acquisitions to diversify its service portfolio. "You need to be ubiquitous, have a global footprint and a wide range of expertise to follow the biggest clients," explained Gonzalo Covarrubias, general manager of WSP Peru, who underlined the importance of having local knowledge but being able to call on specific global expertise. "In Peru we are running several projects which have an active presence of our colleagues from the UK, Canada, Australia, Colombia and Chile," he said.

Covarrubias also emphasized the importance of the environmental segment to WSP's long-term strategy, noting that acquisitions such as that of the US-based company Ecology and Environment in December 2019 were evidence of the growing demand for environment services. "Environmental also brings to the table the social aspect, not just the permitting. It is more holistic and comprehensive, addressing topics such as climate change, sustainable economic development and community engagement," he said, listing multi-disciplinary services such as mine closure as a focus area where WSP's broad offering can add value.

Another of the major international engineering firms to have strengthened through acquisitions in recent years is SNC-Lavalin which, in 2019, enjoyed its best year since starting operations in Peru, according to general manager Alexandra Almenara. Affirming that the company had gained the trust and respect of the Peruvian market despite international issues and the current local context, Almenara mentioned that a focus on studies, construction management and supervision, and environmental work have been driving business growth in Peru. "Building upon the 2017 acquisition of WS Atkins, our consulting services in innovation and new technologies have grown, as clients look to improve productivity and efficiency in their mining operations," she said.

"Mining companies in Peru are becoming more eager to listen to alternative solutions on how they can optimize their production, become more efficient and more sustainable," observed Almenara, listing services provided by SNC-Lavalin such as laser scanning for brownfield projects, drones for surveillance and monitoring, 3D, 4D and up to 7D modeling for engineering designs, and the implementation of road maps for new technologies in the future.



Alexandra Almenara,  
General Manager,  
SNC-Lavalin Peru



Gonzalo Covarrubias,  
General Manager – Peru,  
WSP



Federico Schwalb,  
CEO,  
BISA Ingeniería  
de Proyectos

## LOCAL PLAYERS IN THE MARKET

2019 was also a successful year for Peru's local engineering firms, as brownfields expansion projects for medium-sized operations, rather than the big EPCM jobs suited to the international heavyweights, offered opportunities for growth. This was the case for BISA Ingeniería de Proyectos, which enjoyed its first full year of independence from Buenaventura in 2019, and has worked with Yanacocha, Antamina, Nexa Resources, Buenaventura and Chinalco in recent years. Federico Schwalb, BISA's CEO, explained

that the company was restructured in 2016 to focus on its core business – engineering, consulting and construction management – leading BISA to break even in 2017, followed by revenue increases of 25% in 2018 and 21% in 2019.

Of the services offered by BISA, Schwalb has seen a growing demand for the PMO (Project Management Office) service, where a third party company can be the eyes and ears of an operation, showing the mining company how to execute a project properly. "BISA has realized that a good way to take on projects

is by integrating a PMO which can plan, execute and control," he said, adding: "We expect this area of business to grow in 2020 and I think that we will become the PMO partner for many more projects."

Anddes is a multidisciplinary engineering company headquartered in Lima and with further offices in Chile and Argentina. Renzo Ayala, Anddes' geotechnical manager, expanded on the company's research department created in 2013: "During these years, most of our research projects have been financed by Peruvian government

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funding. That helped us to develop technical articles and studies that we present in industry conferences each year,” he said, continuing: “We are very oriented to mining trends such as risk management and security, which have become especially important due to a large number of failures that have occurred in mines worldwide.”

Anddes has adopted standards set by the International Council of Metals and Mining (ICMM) that make mining processes and the design of mining more rigorous, in line with the company’s policy of replicating the ideas and guidelines that have been implemented in other mining countries to strive for constant improvement.

**TAILINGS MANAGEMENT**

On January 25, 2019, two years on from the Mariana tragedy in Brazil, disaster struck again, as the tailings damn at Vale’s Brumadinho mine in Minas Gerais burst, killing 293 people and causing extensive environmental damage in the region. At Expositram in Belo Horizonte, August 2019, photos of all 293 victims were placed around Vale’s stand in the exhibition hall. Before the first presentation at the tailings management round table, the lawyer representing the victims and their families described in detail how the chemical waste that had descended upon the town had killed them. If ever the industry needed to be shocked into action, it was at this moment. How could a catastrophe on this scale, at a mine site owned by one of the five biggest mining companies in the world, happen again after similar failures in 2015 and 2017?

A lack of high-level expertise may be one factor. “There are a huge number of tailings dams in the world. Klohn Crippen Berger (KCB) has nearly 600 employees who are constantly fully booked on tailings projects and we probably serve only 5% of the market,” related Dan Etheredge, KCB’s general manager for South America.

KCB had its best year ever in 2019, with the majority of the demand stemming from tailings and water management services, according to Etheredge, who commented that, while the industry on the whole has become more diligent with regard to tailings management, there are still cases of neglect. Citing the case of an unnamed client where a dam safety review was performed and a liquefaction assessment was recommended, Etheredge related how the client’s local consultant advised against the investment. “There is a lack of knowledge and comprehension about tailings management and, even after the world has seen many disasters, there are still some companies trying to cut corners,” he reflected, adding: “We have also recently seen a tailings facility under construction with no technical specifications or detailed design. The dam was being built from feasibility level drawings.”

Considering the complexity and the variety of tailings dams, as well as the environmental and human liabilities surrounding the subject, mining companies are looking for the best expertise on the market. Alberto Coya, Stantec’s general manager for Peru and regional manager for LatAm, underlined his company’s exceptional reputation in tailings built through its global network of expertise. “Currently mining companies are demanding ‘grey hair,’ by this I mean they are putting a premium on individuals with many years of experience,” elaborated Coya. “Given recent failures, the industry demands more hands and eyes than ever to look after tailings structures,” he concluded.

The importance of being able to draw upon global expertise to provide tailored-tailings solutions was also highlighted by Karina Zevallos, managing director at Weir Minerals Peru, who listed a number of the services that must be considered: “Tailings is a critical consideration for the industry, and mine operators are continually looking for solutions for the safe transport, storage and disposal of tailings, as well as converting tailings into construction materials and mine backfill.”

**UNDERGROUND MINING CONTRACTORS**

The global mining industry is migrating underground, as ore grades decline and the incremental extraction of earth’s finite resources continues. In some countries, such as Canada and South Africa, underground mining is the norm, with operating depths more than 3 km below the surface. In neighboring Chile, Codelco’s Chuquibambilla, at one point the largest open pit copper mine in the world by excavated volume, opened its underground operation in August 2019, allowing the state copper giant to exploit the remaining resources located below the current ore deposit until 2058.

While there are currently no large scale underground mines in Peru, there has already been growth in this segment with medium to small scale operations, and the myriad of mining contractors active in Peru are preparing for the impending growth opportunities in the



Gianflavio Carozzi,  
CEO,  
AESA



Eduardo Cossio Chirinos,  
CEO,  
INCIMMET



Enrique Sattler,  
CEO,  
Robocon

years to come, with the likes of Yanacocha underground, Corocochuayco and Antamina all expected to transition underground in the new decade.

For Paul Murphy, Mining Plus’ South America manager, whose parent company Byrncut specialize in large-scale underground operations, when an operation should move underground is primarily defined by the ore body, topography and stage of the project. “Peru will move in the same direction Chile has, where we are seeing that for the older

pits, an open cut / underground trade off study clearly shows that it is more favorable to extract the material under the pit via an underground mining method (often a caving method) rather than continue mining via an open cut method,” he explained.

Many projects also begin as underground operations with no open cut component at all, such as Nexa Resources’ Cerro Lindo polymetallic mine in Chinchá, one of the world’s 15 largest zinc mines. INCIMMET is one of the contractors working at Cerro Lindo

and Eduardo Cossio Chirinos, INCIMMET’s CEO, spoke of the new technology being introduced to the operation to boost productivity and cut operational costs: “Within the new fleet we will have at Cerro Lindo we purchased a machine that performs the cable bolting service and requires only one operator, compared to the old machines that require seven for the whole process.”

Another of the major players in Peru’s underground mining value chain is AESA,

which recorded record sales in 2019 due to a combination of new projects as well as ramp ups on existing projects, according to Gianflavio Carozzi, CEO. Speaking of the migration from open pit to underground operations, Carozzi gave the example of Yanacocha: “AESAs are currently in the process of completing its fourth exploration project with Yanacocha, which will run until April 2020. The next step will be a large sulphides project which will significantly extend Yanacocha’s mine life.”

A sharpened focus on safety has been key to AESA’s growth in 2019, as the company reshaped its policies, standards and procedures in order to address a reality in Peru: low reading comprehension rates. “You cannot just assume that your policies, procedures and training material are going to be well understood,” explained Carozzi, continuing: “We thus decided to use alternative methods of delivery, particularly a bigger use of visual aids. As such, we started the use of comics and animated videos to inform on critical aspects of safety.” As larger underground operations become commonplace in Peru, will they follow the model of using integrated contractors? This was the question posed to Diego Morales, general manager for Peru at Mas Errázuriz, which has been working on the Asana river diversion tunnel at Quellaveco. “You will have one single contractor or, if the mine is too large, several contractors in different areas who take care of everything in those specific areas,” responded Morales, referencing El Teniente, one of the world’s largest underground mines, which employs five contractors including Mas Errázuriz. “In older mines,

it is not so simple, as absorbing smaller contractors to integrate the operation presents social issues to the mining operator,” he added.

**RISING TO THE SURFACE**

A noticeable trend when speaking with the larger underground contractors in 2020 has been their increasing presence in open pit operations. There seem to be two main reasons for this: Peru’s mining industry is still predominantly open pit, especially its largest operations, and, secondly, with the expected migration of open pit operations moving underground, contractors see the opportunity in creating working relationships with clients at the surface to ensure a smoother transition to depth.

Gianflavio Carozzi explained that while AESA has primarily worked with mid-sized and large underground mining operations, two years ago the company started working with open pit operations as they were beginning to transition underground. “We envision that there will be a transition from open pit to underground as it becomes much more expensive to extend the mine life on these operations as open pit,” he said.

Expanding its services to cater for the open pit market has also been part of INCIMMET’s strategy, according to Eduardo Cossio Chirinos, who mentioned that after a first foray into the open pit market at Quellaveco in 2011, this side of the business really took-off for the company in 2017 when it started working with Barrick Gold, Freeport McMoRan, Southern Copper and Chinalco. “Currently, we have a total of seven open pit mining projects. We do not work on the blasting or hauling of mineral ore yet, but focus more on infrastructure projects, earth movements, civil and concrete works – facilities that go hand in hand with the direct operations of the mine,” he specified.

**TECHNOLOGICAL ADVANCEMENTS**

Peruvian company Robocon is the only shotcrete contractor in the world to be affiliated with EFNARC (European Federation for Specialist Construction Chemicals and Concrete Systems), and has been mechanizing underground processes with the likes of Buenaventura and Pan American Silver, as well as integrating with contractors to work on tenders for small mines that are merging from dry to wet shotcrete, according to CEO Enrique Sattler. Discussing Robocon’s latest technologies, Sattler explained how the company tailors its solutions depending on the context of the mine: “This solution will transform narrow vein mining, as tasks that used to take 1.5 days (or three shifts) can now be completed in 30 minutes, in a secure operation,” he said, adding: “The objective is to mechanize the shotcrete solutions, rather than use a larger insecure workforce.” One of the innovations being used in the Volcan Chungar mine in Peru by Robocon is the slick line shotcrete transportation method – a vertical pipe that takes shotcrete from the surface to depth through gravity. Working in collaboration with Tumi, Robocon can ensure a perfect vertical raise boring to install the pipe and components of the Slick Lines, allowing the shotcrete to be transported downwards efficiently. “This saves mining companies time and has significant cost benefits – the investment is paid off in only 12 months and increases the productivity of the mine,” affirmed Sattler.

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# Innovation and the Path to Modern Mining

*No longer an afterthought; innovation should be thought of as a necessity rather than a choice*

Nothing breeds innovation like necessity, and the downturn forced a traditionally conservative industry to look for new methods to drive down costs and increase productivity. As market conditions have improved, the reasons to innovate have evolved and are no longer confined to costs, production and safety. The increasing prominence of environmental, social and governance (ESG) issues mean that mining companies must also reduce their carbon footprint. Confronting the issue of climate change also means electrifying the economy, a transition that requires vast amounts of copper. However, if increasing demand for metals means the price of copper increases, it will be harder to drive lower-cost carbon out of the economy and the trends in climate change will continue. It is therefore imperative that miners continue to innovate, as more than just profit is at stake. “More than anything, I believe that economic pressure will drive the implementation of technology to significantly reduce the cost of the

metal society needs to achieve electrification of the economy,” stated Douglas Morrison, president and CEO of the Center of Excellence for Mining Innovation (CEMI) in Canada, which, in 2019, signed a memorandum of understanding (MoU) with Universidad Nacional del Centro del Perú (UNCP) to promote mine innovation. “Climate change will soon begin to threaten coastal infrastructure on a scale which most economies will not be able to tolerate,” warned Morrison. The successful adoption of new technologies requires industry leaders to set an example others can follow. In this context, the original equipment manufacturers (OEMs) play a key role in designing, manufacturing and promoting the innovations that are shaping the future of mining. Several years ago, Epiroc identified three main technological trends: automation, digitalization and electrification, according to Ángel Tobar, Epiroc’s general manager for the Andean region. When asked about the receptiveness of the Peruvian market

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*“Epiroc identified three main technological trends: Automation, Digitalization and Electrification are the three big game-changers in mining. These are advancing faster than initially expected, and they will allow us to operate with the highest environmental standards, increasing safety, productivity, wealth and job opportunities.”*



**-Ángel Tobar,  
General  
Manager  
Andean Region,  
Epiroc**

reduction of diesel utilization and related costs, all of which while having zero emissions,” he added.

Despite advances in recent years, the transition towards electrification at Peruvian mine sites will not happen overnight, and for Giorgio Mosoni, general manager at John Deere distributor Ipsa, it is dependent on the type of equipment used: “It makes perfect sense for equipment such as the excavator, which works from a stationary position but has the rotational movement which creates the energy to be able to charge itself,” he explained. “I do not think we are moving quickly towards a fully electric machine, as you are dealing with hydraulics and the power needed to move large amounts of earth, so the battery technology must mature,” continued Mosoni, noting that hybrid equipment is becoming a lot more popular and allows significant savings when it comes to fuel consumption.

**THE MARCH TOWARDS DIGITALIZATION**

Interestingly, when it comes to their core business, miners are not risk-averse. Mining is an inherently risky business, from the junior community raising millions of dollars to explore land that is statistically unlikely to be developed, through to the processes involved with extracting ore at altitude, depth, or both. However, by the time a mine is ready to go into production, traditional methods are often preferred as operators look to guarantee output for management and shareholders. For mining companies, deciding which of the myriad of technologies available on the market they should use is not straightforward, and that is where specialized digital transformation companies, such as Sitech, come into play. “The digital gap is constantly growing, so our job is to try to close that gap and prevent it from expanding,” stated Marcos Wieland, Sitech’s general manager, relating that the competitive labor costs in Peru mean local mining companies often do not feel the same incentive to innovate as markets such as Australia or Canada. “Our strategy has been to go step by step, educating customers, finding quick win opportunities, and promoting the right leadership initiatives to generate an increasing sense

*“When the metals prices are high, some companies think they do not need the technology as they are doing well. When the prices are low, you need the technology but you do not have the money to invest in it. The truth is, the investment is necessary in both cases.”*

**-Marcos Wieland,  
General  
Manager,  
Sitech**



of urgency that will lead to higher adoption rates,” he said, adding that Sitech has been working on establishing roadmaps for the inevitable digitalization and automation journey ahead.

Wieland explained that the rhythm of adoption varies depending on the industry sub-segments. For example, adoption in underground mining is slower than in open pit mining, where mines are larger and where global operators have bigger budgets. Sitech sees the migration of information to an industrial cloud and the ability to capture data and transform it into information for decision making as the direction the industry is headed. However, while the industry goes through the learning process for such technology, Wieland mentioned that tangible solutions related to safety and security, such as cameras, proximity detection and collision avoidance sensors, and fatigue monitoring tools have been driving business growth. So when is the best time for a mining company to invest in innovation? “When the metals prices are high, some companies think they do not need the technology as they are doing well. When the prices are low, you need the technology but you do not have the money to invest in it,” reflected Wieland, concluding: “The truth is, the investment is necessary in both cases.”

**SPECIALIST UNDERGROUND EQUIPMENT**

While the underground market in Peru currently lacks large scale mines such as Codelco’s El Teniente in Chile, a variety of small to medium sized operations offer the chance for both national and international players to establish a foothold before the impending transition to depth. One of the global leaders in underground mining equipment is Finnish company Normet, which has a fleet of 270 machines in Peru. Franklin Pease, general manager at the company’s Peruvian branch, has noticed an increasing industry push for mechanization and automation in the last 12 months, but noted such changes take time: “Of course, mechanization requires a cultural change and modifications to the planning processes of mining companies, so change does not happen overnight. You also need better training; people need to be prepared to make sure that the operation reaps the right benefits.”

One of the processes that is still being mechanized is the charging of explosives for blasting, either ANFO charging or emulsion charging. “We are working very closely with some of our clients in this respect and this shows that the industry is transforming,” said Pease, explaining that with a mechanized approach the efficiency of the blasting process can be improved, risks and costs can be reduced, and safety levels increased. In Peru, Normet is working with blasting-provider Exsa in the mechanization of processes in several units for Nexa Resources. Competing against the global dominance of international OEM’s is a daunting prospect, but Peruvian underground mining equipment manufacturer Resemin has carved out a niche for itself and sold machines in five continents. Resemin’s Muki equipment, suited for smaller tunnels of 3 meters by 3 meters, and with four applications (drilling, scaling, roof bolting and cut-and-fill mining) continues to be a standout product for the company, but in recent years Resemin has expanded into the utility vehicle space as well. James Valenzuela, Resemin’s founder and CEO, spoke of his company’s evolution: “Approximately two years ago, Resemin started to produce utility vehicles, challenging Normet who are the leaders in the market. Today we produce scissor lifts, personal carriers, scalers, and emulsion and ANFO chargers.”

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**Kai Rothgiesser,**  
General Manager,  
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**James Valenzuela,**  
Founder and CEO,  
Resemin

Having invested US\$10 million into a new production plant in 2019, Valenzuela hopes the increased capacity will help develop business both domestically and in markets such as Australia, with a target of selling 120 machines in 2020. As a company that prides itself on innovation, Valenzuela concluded by announcing an important milestone for the new year: “Resemin is also launching the first battery powered front face drilling rig in the Peruvian market in February 2020.”

**DATA-DRIVEN SERVICES**

Innovation is also impacting the product offerings of companies further down the value chain, such as providers of equipment components. Rexroth, a German hydraulic drive specialist that forms part of the Bosch group, has been expanding in Peru in recent years. The company is opening a new service center in Arequipa to help mitigate logistical challenges in the southern region of Peru and to help with aftersales.

Kai Rothgiesser, Rexroth Peru’s general manager, noted that 80% of all hydraulics in Peruvian mines are Rexroth products, and this level of penetration has opened the door to service opportunities at the mines. “Traditionally, Rexroth has been offering repair and aftersales services to the market, but in recent times we have experienced a very high demand for condition monitoring,” noted Rothgiesser, stating that Rexroth has identified this as a high growth business area for the company, with new contracts signed and ready to be implementing in Q1 2020. Describing the technology, Rothgiesser claims that Rexroth’s condition monitoring solutions are unique in the Peruvian market: “Condition monitoring constantly measures wear and reports the need for replacement when critical limits are reached. Scheduled, on-time replacement reduces the risk of machine stoppages and thus increases machine availability. At the same time, this approach lowers maintenance costs

since only actually worn components are replaced.” Data-driven services are also driving business growth for another German company with a strong presence in Peru – compressed air specialists Kaeser Compresores. Marco Vásquez, general manager of Kaeser Compresores Peru, explained how the company’s air-on-demand product works: “The Sigma Air Manager (SAM) 4.0 acts as the central head that controls the individual equipment with maximum efficiency while adjusting the flow capacity according to the demand,” he said, elaborating that predictive maintenance capabilities activate an automatic service response. This way, if there is a problem with any of the components of the compressed air station, the system will identify the unit and what parts have to be changed, and will create a service order. A technician will have been sent onsite, all this before the client finds out that there is a problem.

# Mining Services

*Technological advances help reduce mining’s environmental impact as clients prioritize quality*

Whisper it, but the downturn seems to be in mining’s rear-view mirror, at least from the perspective of the producers, where the focus has shifted from drastic cost-cutting exercises to increasing production efficiency. When times were hard, service sector survival often depended on who had the lowest bid and, while the current context is far from the excesses of the previous supercycle, miners are cautiously increasing expenditure to guarantee quality.

“The price is still very important for many customers, however, more automated services with higher safety standards are becoming increasingly popular,” observed Miguel Ángel Arenas, general manager of Peruvian drilling contractor Geotec, who has also noticed customers becoming more sophisticated in their requests for new technologies. “An example of this is the directional drilling service Geotec implemented in Peru along with our partner in the United States,” he said. Automated drilling equipment is becoming more commonplace in Peru, particularly with the biggest players in the industry, such as the Newmont-operated

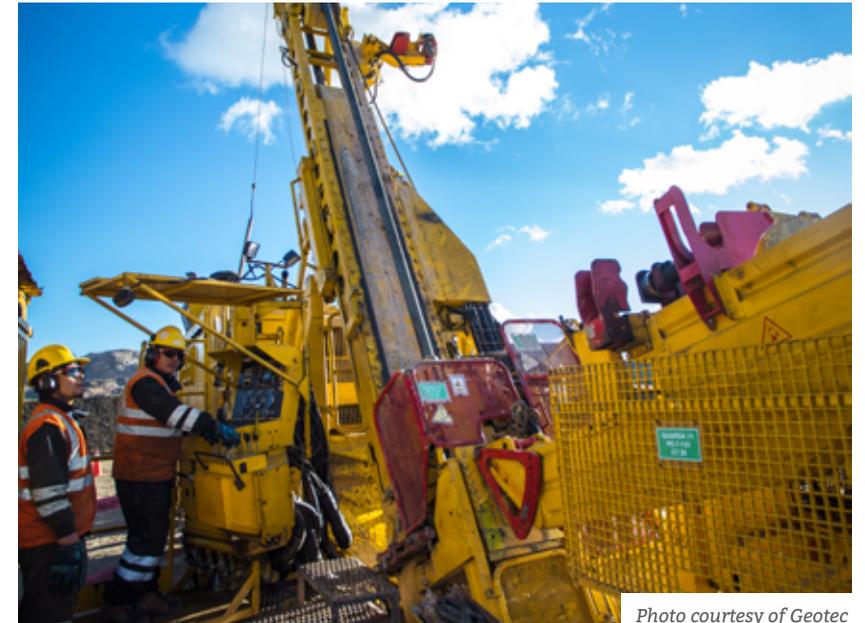


Photo courtesy of Geotec

Yanacocha mine where Geotec has been using the Epiroc Smart rod handling machines. “Although this represents a bigger upfront investment, they increase safety and productivity significantly,” stated Arenas, who explained that the capital investment is paid back as the machines can drill during downtime.

Expanding on this theme, Arenas commented that Geotec is working on an artificial intelligence (AI) project to increase production and remove drilling workers from the firing line, a key focus area for 2020. Environmental concerns are also high on the agenda for mining companies as

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**Wilson Miranda,**  
General Manager,  
Confipetrol Andina

companies payment can be an issue due to a lack of liquidity and cash flow,” clarified Arenas.

**BLASTING**

The competitive market for blasting services in Peru is served by both international and local explosive companies, including large players such as Orica, Famesa, Enaex and Maxam. So how then, does one differentiate oneself from the competition?

For Alejandro Caicedo, Orica’s general manager in Peru, the winning players in the medium and long term will be those who can provide value and technology, rather than those that offer the lowest price. Giving the example of Orica’s introduction of the Bulkmaster 7 Mobile Manufacturing Unit in Antamina, Caicedo added: “We are developing a fully automated blasting process, which considers innovations like WebGen™, the world’s first wireless initiating system that operates remotely and BlastIQ™, a cloud-based digital platform designed specifically to enable continuous improvement of blasting outcomes.”

Discussing how products are developed in the blasting industry, Caicedo was keen to stress that Orica looks for an integrated solution rather than simply a product, citing the company’s acquisition of GroundProbe – whose technologies detect instabilities in real time and predict when



**Miguel Ángel Arenas,**  
General Manager,  
Geotec

collapse of mines and dams will occur – as evidence of Orica’s commitment to offer an ‘end-to-end’ approach. “We have an investment that is three times greater than that of our competitors in R&D. At the same time, we have more than 200 technologists and more than 40 software developers dedicated solely to our digital solutions to optimize the blasting process itself and the whole process downstream,” stated Caicedo.

From a safety standpoint, removing operators from the line of fire through connectivity, such as the wireless EBS being used in Australia with BHP Billiton, is contributing to a safer blasting process. It is also generating an enormous amount of data, observed Caicedo, who mentioned the possibility of improving every single process through data analysis. “What is going to transform the business is having the tools and the ability to analyze all

that data. With our tools in BlastIQ™ we will address this challenge and allow our customers to monitor from their desks how benches are progressing, hole by hole,” he concluded.

**THIRD PARTY SERVICES**

The success of any large industrial operation relies on knowing where to invest a company’s human resources and knowing which ‘non-core’ activities can be outsourced to third party specialists. In the mining industry, finding mineral reserves and extracting them safely, sustainably and efficiently is the core business, but the list of processes associated with a successful mining operation is long. This is where third-party contractors come in.

One of the larger players in this sector is Confipetrol, a company of Colombian origin, but with a large presence in Peru as well as offices in Bolivia and Argentina, and the intention to expand into Chile. With more than 20 years of experience in South America and over 4,500 certified employees, Confipetrol offers a comprehensive range of services that include maintenance for the mining sector. “We usually help clients during opex rather than during construction, because we take care of their repair and maintenance services while an operation is in progress,” explained Wilson Miranda, general manager of Confipetrol Andina (Confipetrol’s Peruvian subsidiary), which has grown 20% annually in operation and maintenance (O&M) services.

Confipetrol has worked with Nexa Resources at its Pasco Mining complex (combining the Atacocha and El Porvenir mines) and at Cerro Lindo, providing equipment servicing and maintenance, as well as at Yanacocha in the maintenance of its plants, at Minsur with equipment maintenance, and Barrick Gold at Lagunas Norte. Suggesting that the maintenance of equipment, plants, indoor mine equipment and open pit mine equipment is best left to specialized companies which measure their services through key performance indicators, Wilson concluded: “That is the best way to focus on finding reserves, exploring and processing them.”

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*"The largest mining companies are operating in Peru,  
but at PDAC 2020 we seek to show that there is room for more."*

**Carla Martínez**  
General Manager,  
Canada Peru  
Chamber of Commerce  
(CCCP)



**Carlos Castro**  
Leader of the  
Peruvian Delegation to PDAC,  
Canada Peru  
Chamber of Commerce  
(CCCP)



**Can you explain the evolution of the mining sector's relationship between Canada and Peru?**

**CM:** With the arrival of the junior companies many years ago, the expectation for investment in our country's mining industry was large. Unfortunately, juniors have suffered in recent years, and many of those operating in Peru have also struggled. The number of juniors operating here has decreased, which is reflected in the membership of the Canada Peru Chamber of Commerce (CCCP). Despite this decrease, there is still a robust interest in mining between Peru and Canada, and 92% of the CCCP members are mining companies. They are interested in seeing the progress, strategy and improvements that the Peruvian government plans in the mining sector to boost their businesses.

**CC:** Proof of the growing link in the relationship between Peru and Canada in the mining sector is the participation of a significant Peruvian delegation – usually the second largest one – attending one of the most important mining conventions in the world, the Prospectors & Developers Association of Canada (PDAC) in Toronto, in which we are going to participate as a country sponsor for the seventh consecutive year, demonstrating Peru's current and potential polymetallic investment opportunities.

**In comparison to many other countries in Latin America, Peru has enjoyed more stability in recent years. Is this one of the more attractive selling points for foreign investment?**

**CC:** Peru has enjoyed more stability in recent years despite the regional political unrest, and is one of the richest countries in terms of minerals and metals. Peru registers the lowest country risk in Latin America. The largest mining companies are currently operating in Peru, but at PDAC 2020 we seek to show that there is room for more.

**CM:** Peru is the best positioned country in the region today – this is a competitive advantage for us and an interesting opportunity for investors. However, we want to paint a real picture of the business

environment here. Investors already know the country and want to hear the truth regarding its challenges and problems. We want to discuss social conflicts, permitting procedure times, and costs – the main reasons why investors withdraw their capital from Peru.

The biggest challenge in Peru is the length of time that authorizations take. The government has been working on tools to attract more investment, but frankly these have not been working. Juniors are leaving the country because of this. To reignite the interest of the junior mining community, permitting and authorization times must be reduced.

**Can you tell us about the CCCP's Mining Mission of Innovation and Technology in Sudbury?**

**CC:** The VI Mining Mission organized by the CCCP will take place from 4th to 6th March in the framework of the PDAC 2020. The destination is the city of Greater Sudbury, Ontario, with a delegation of eight executives from relevant companies in the mining industry, such as Anglo American, Minera Colquísiri, and JRC, as well as the regional governors of Apurímac and Moquegua.

Greater Sudbury has developed as a center of innovation in mining for years, so it is now recognized as a case of success in environmental rehabilitation, but also as one of the leading centers of research, innovation, education and mining exploration in the world.

**What would the CCCP like to achieve in the next two years?**

**CM:** We want to be a bridge of dialogue and understanding between the government and the mining companies in order to support them in doing business and investing in Peru. Our main challenge this year is working towards generating new businesses and strengthening the current ones. PDAC is one of the platforms that supports the CCCP's objectives directly, and we hope this collaboration can contribute to positive changes so that the climate for foreign investment into Peru can improve in the years to come.



GLOBAL BUSINESS REPORTS

This publication is a pre-release edition of GBR's full special report on Peruvian mining, that will be published in Q3 2020.

If you wish to be interviewed for the report, please contact Ben Cherrington (bcherrington@gbreports.com)

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**Cover photo:** Courtesy of MMG Las Bambas