



GLOBAL BUSINESS REPORTS

PERU
MINING
2021



Pre-Release

Optimism Returns to Peru's Mining Sector

After tragedy comes opportunity, but a pivotal election looms large

The challenges faced by Peru in 2020 were unprecedented. Despite the strictest lockdown restrictions in the continent, Peru holds the grim title of highest Covid-19 deaths per capita in South America, and experienced the biggest economic contraction in the region. It has been a tragedy felt on a personal, collective and economic level. The severity of the pandemic exposed structural flaws in Peru's socioeconomic fabric: a level of poverty illustrated by 44% of households not having a refrigerator (according to a 2018 government survey). In such a context, social distancing is a distant dream.

In parallel to the health crisis, Peruvian politics was characteristically shambolic in 2020, as the country saw three presidents and five mining ministers in the calendar year. As Peru

gears up for a general election in April 2021, the need for stability should not be understated.

On the face of it, such adversity paints a bleak picture. However, the outlook for Peru's mining industry, which accounts for 60% of the country's exports, offers reasons for hope. Soaring metals prices since the second half of 2020 have been the catalyst for renewed optimism, and a mature, well-run mining industry with a deep pool of local talent has put Peru in the position to rebound strongly in 2021. "The message we are getting is that, despite a 20% output reduction in 2020, mining companies expect an equal increase in 2021," revealed Gonzalo Díaz Pró, general manager of Caterpillar distributor Ferreyros, relating that mining companies have been requesting new proposals for equipment additions

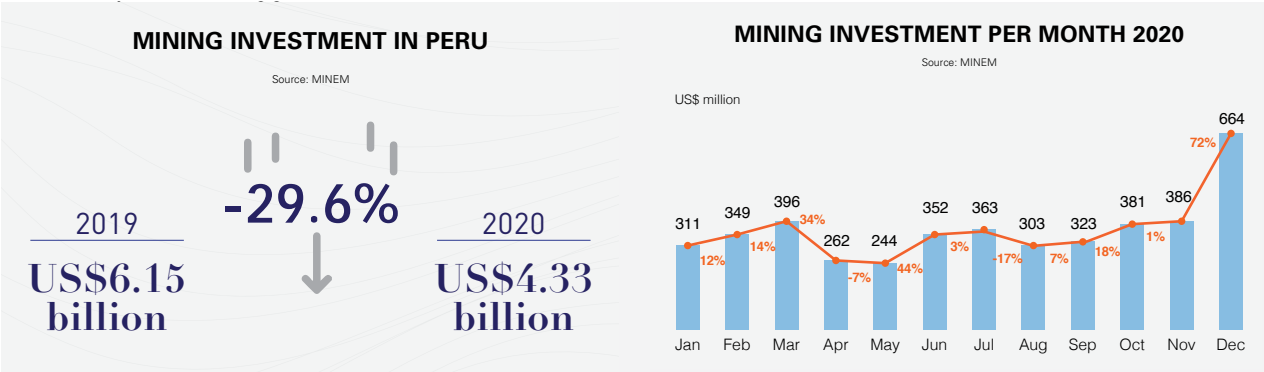


Image courtesy of Scania

"It is not possible to think about fiscal consolidation and sustainable growth without the mining sector, and this needs to be understood by our country's authorities."



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

to their fleets, with an emphasis on expanding brownfield operations. As producers look to make up for time lost during lockdown, juniors are advancing exploration under more favorable market conditions, and service companies reap the benefits of pent-up demand. Nevertheless, the second wave of Covid-19 threatens to detail recent progress. By mid-February 2021, the daily death toll had risen above 200, and a 300% rise in demand for medical oxygen prompted Chile to offer 40 tons of oxygen per week to its Andean neighbor, according to Peruvian president, Francisco Sagasti. The escalating health crisis, however, should not stop Peru's mining industry, as the country simply cannot afford to replicate restrictions that paralyzed operations for three months in 2020. "During the first wave, Peru was the only mining country that shut down mining operations, and that was a mistake," said Víctor Gobitz, president of the Peruvian Institute of Mining Engineers (IIMP) and CEO of Antamina. "It is a priority to maintain the dialogue with the authorities during the second wave," he added. In contrast to Chile, which saw a modest reduction in its copper output, from 5.79 million tonnes (2019) to 5.70 million tonnes (2020), Peru's lockdown caused production of its most valuable commodity to drop by 12.5% for the year. On a more positive note, Claudia Cooper, president of the Lima Stock Exchange (BVL) and former finance minister, observed that the second

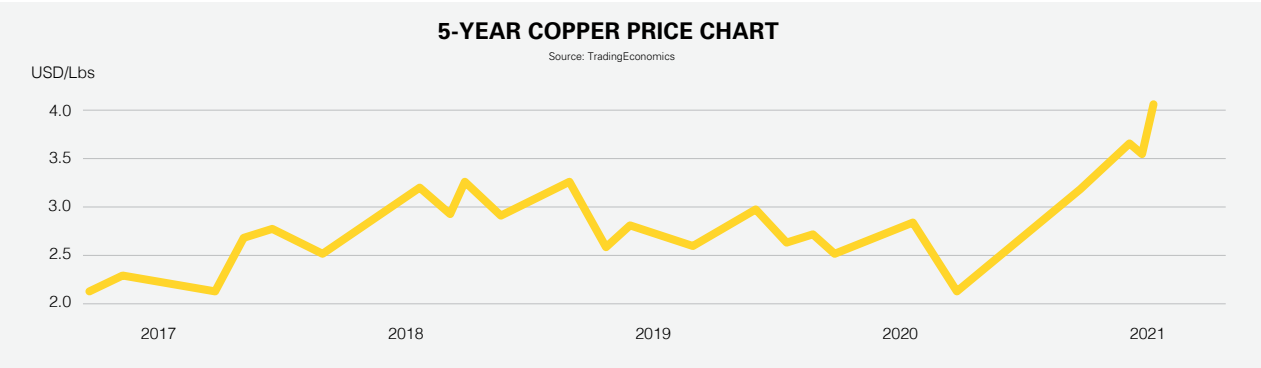
Geotec

SAFETY AND INNOVATION: OUR BEST INVESTMENT

Our wide experience in drilling, the most advanced technology, and our technical team, guarantee the quality of all our services.

Av. Industrial 228 / Ate Vitarte - Lima
T: (511) 326 5494 / Ax. 2126 - 2105
geotec@geotec.com.pe

www.geotec.com.pe



national lockdown (which began in February 2021) has not been as damaging as the first, as a balance between health and the economy has been struck by the government. According to the IMF, Peru is expected to experience the strongest recovery in Latin America in 2021 (9% growth), and Cooper emphasized the mining sector’s role in both short-term recovery and long-term macroeconomic stability: “It is not possible to think about fiscal consolidation and sustainable growth without the mining sector, and this needs to be understood by our country’s authorities.”

THE COPPER OPPORTUNITY

There are a multitude of reasons to be bullish on copper in the medium to long term, from infrastructure-based government stimulus packages, to ‘the green reset’, where global superpowers China, Europe, and now the US (after Biden’s victory) are all aligned in their plans to move away from fossil fuels. This transition will be driven by copper supplying material for solar, wind, energy storage systems, electric vehicles (EVs) and EV charging stations. Global EV + PHEV (Plug-in Hybrid Electric Vehicle) sales reached 3.24 million units in 2020, compared to 2.26 million for 2019, and are expected to rise to over 21 million units by 2030. The average petrol engine vehicle requires 20 kg of copper, a hybrid

“Peru produces 2.5 million tonnes of copper annually, so every cent the copper price goes up represents an additional US\$50 million in revenue. It is an opportunity the country cannot miss.”

- Rómulo Mucho,
General Manager,
Pevoex



40 kg, and a plug-in EV 109 kg, while the cars of the future will need as much as 163 kg of the metal. “Copper demand is going to be psychedelic,” proclaimed Robert Friedland, speaking at Mines and Money London in November 2020. While the long-term consensus on copper has been favorable, few could have predicted how quickly demand would pick up in the short term, particularly in the context of a global pandemic where economic growth has been sluggish at best. Surging demand from China and dwindling copper warehouse stocks sent the red metal to a 10-year high of US\$4.36/lb in February 2021, a remarkable figure less than a year since copper had cratered to 4-year low of US\$2.10/lb in March 2020. “Copper’s current price

strength is just the first leg of a structural bull market,” stated Nicholas Snowden, analyst at investment bank Goldman Sachs, which expects the copper price to break its all-time high in 2022. Peru, as the world’s second largest copper producer, will undoubtedly benefit from rising prices, however, there is a pervasive feeling that the country could produce a lot more than it currently does. Multiple large-scale projects remain undeveloped, stuck in a quagmire of permitting complications and community conflicts. Even projects with permits in hand, such as Tía María – the poster-child of undeveloped Peruvian mining assets – are not guaranteed the green light, as emphasized by former president Martín Vizcarra, who stated that the project would never be developed under his administration. “Peru produces 2.5 million tonnes of copper annually (mt/y), so every cent the copper price goes up represents an additional US\$50 million in revenue. It is an opportunity the country cannot miss,” stated Rómulo Mucho, general manager of Pevoex and president of Agromin 2021. Agromin will take place in Trujillo from November 24 to 26, bringing together agriculture and mining with the goal of unifying two essential industries with intrinsic links to local communities. Indeed, unification should be the operative word for whoever wins the Peruvian general election in April, as conflicting interests have contributed to an unstable political backdrop. Marcobre’s Mina Justa, due to come into production in April 2021, and Anglo American’s Quellaveco, expected to start in 2022, offer a platform for Peru to produce 3 million mt/y of copper by 2023. However, ironing out social conflicts and establishing a semblance of political continuity will be key for Peru to continue this upward trend and close the supply gap with Chile.

A PIVOTAL ELECTION

On April 11th, 2021, Peruvians will go to the polls on what is shaping up to be a hotly contested general election. It will also be a pivotal one, as the newly elected president, who will take power in July, will have to guide Peru through an economic recovery in the shadow of the pandemic. The hope is that this shadow will start to dissipate later in 2021, but this depends on the successful roll out of a vaccination program that has been shrouded in controversy after reports that government officials received doses before health workers prompted the resignations of Peru’s health minister and foreign minister in February. On February 28th, centrist newspaper La Republica published a voter intention poll ran by IEP (Instituto de Estudios Peruanos), which saw Yohny Lescano with a slender lead, but only 11.3% of the total vote. The poll also revealed that leftist candidate Verónica Mendoza sat second in the polls with 8.9%, while Keiko Fujimori sat in third with 8.1%. The fact that Lescano and Mendoza occupy the top two spots with less than two months to go before the election should send a shiver down the spine of Peru’s mining industry. Lescano has spoken about amending the constitution to make the State the sole owner of all metals, and stated that both Tía María and Conga should be annulled. As for Mendoza, her “Nueva Minería”

“The message we are getting is that, despite a 20% output reduction in 2020, mining companies expect an equal increase in 2021.”

- Gonzalo Díaz Pró,
General Manager,
Ferreiros



proposal looks to add more rigorous regulations on an industry already overburdened with cumbersome bureaucracy. With previous favorite, George Forsyth, now disqualified, a shallow field presents a recipe for those with a radical agenda to cause an upset. When the dust settles after the election, the hope is that the new regime will carry on the positive work carried out by current mining minister Jaime Gálvez, who was a key figure in the formulation of the Vision of Mining to 2030, promoted by the Center for Convergence and Good Mining-Energy Practices (Rimay). “It is important to restart workshops that had to stop due to the pandemic, where mining companies, government authorities, NGOs and civil society came together to define the vision of mining in Peru for 2030,” commented Luis Rivera, Gold Fields’ executive vice president of the Americas.



**CHAKANA
COPPER**



SOLEDAD PROJECT
High-Grade Copper-Gold-Silver Discovery in Peru

- Experienced Management with Proven Track Record
- Seven High-grade Au-Cu-Ag Discoveries, Multiple Breccia Pipe Targets
- Fully Funded 26,000m Drill Program for 2021

info@chakanacopper.com | www.chakanacopper.com

TSX.V: PERU | OTCQB: CHKKF | FRA: 1ZX



**16
YEARS**

**LEADERS IN
UNDERGROUND
MINING
SHOTCRETE**

Sprayed more than 2 million m³ of Shotcrete

Produced more than 500,000 m³ of Back Fill

Reinforced more than 2,000 km of Mining Tunnels

Trained more than 1000 specialized operators

Taylor-made solutions for mining concrete

Shotcrete equipment manufacturing and renting

**SMALL TUNNELS
SHOTCRETE
ROBOT**
(1.6 wt X 2.2 ht m).



Designed and manufactured by Robocon Peru.

Only contractor EFNARC member

info@robocon.pe | www.robocon.pe

“It is important to restart workshops that had to stop due to the pandemic, where mining companies, government authorities, NGOs and civil society came together to define the vision of mining in Peru for 2030.”



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

This sentiment was echoed by Víctor Gobitz, who added that this effort needs to be carried out at a regional level in addition to the continuation of an inclusive working group focused on the industry's long-term sustainability. Gobitz elaborated: “The mining industry is so important to the country that there should be a defined mining policy, in the same way Peru has solid tax policies and macroeconomic policies. This would assure continuity regardless of government changes.”

Minister Gálvez and his predecessor Luis Miguel Incháustegui have received widespread approval from Peru's mining sector. However, the political merry-go-round in recent years has resulted

in a lack of continuity. “The frequency of political changes is a real issue,” commented Federico Schwalb, CEO of BISA Ingeniería de Proyectos. “I know the current minister and vice minister of mines, and they are very good people that know the importance of project development. However, they do not have the tools or time to enact real change.”

Streamlining permitting should be top of the agenda for the next mining minister, with adjustments to the prior consultation law of paramount importance to stimulate investment into early-stage exploration. “It is essential that political leaders establish consensus and guarantee an environment of stability, predictability and compliance with deadlines,” said Jorge León Benavides, president of the Canada Peru Chamber of Commerce (CCCP).

Fortunately, the new administration should be blessed with macro conditions as favorable for mining as anything seen since the previous super cycle ended in 2011. Long term planning is necessary to make the most of the country's natural resources, which currently host a mining portfolio of 46 projects totaling more than US\$56 billion, and the geological endowment to increase this further. An infrastructure deficit worth nearly US\$100 billion also offers an opportunity for economic revival. “The best way to fund infrastructure investment is through the income provided by mining, generating a virtuous circle for employment and development,” reflected Gobitz. •



Image courtesy of Southern Copper Corporation

“The best way to fund infrastructure investment is through the income provided by mining, generating a virtuous circle for employment and development”



Víctor Gobitz
President,
Peruvian Institute of
Mining Engineers
(IIMP)

What are the priorities of IIMP for 2021?

A key priority for the industry and the country is to tackle the pandemic. During the first wave, Peru was the only mining country that shut down mining operations, and that was a mistake. The more than two months that were lost in terms of production had an impact on the economy. So, it is a priority to maintain the dialogue with the authorities during the second wave.

Beyond this, we will have a new government taking over in July 2021, and it seems likely that the presidential election will require two rounds. During this election process, the industry will have to be active to send its messages to the public. Over the last two years, we have seen two positive initiatives by the government, supported by IDB. The first one is the ‘Rimay’ initiative to define a vision of the mining industry towards 2030, an effort that needs to be continued now at a regional level. The second one was the creation of an inclusive working group to work on the industry's long-term sustainability. The mining industry is so important to the country that there should be a defined mining policy, in the same way Peru has solid tax policies and macroeconomic policies. This would assure continuity regardless of government changes.

What measures are being taken to prevent contagion during the second wave of the pandemic?

The mining industry in Peru already followed global standards before the pandemic in terms of industrial safety, occupational health, and the environment. With these three pillars, we have now implemented a fourth pillar related to the pandemic. The formal mining industry is using the molecular tests, which offers a higher level of accuracy than the rapid tests. Molecular tests are done when workers enter or leave the camp. Also, distancing measures apply to workers while they are on site, with isolated working cells. This protocol is working well, and it will probably continue over time. Of course, it means significant extra costs for mining operators.

Considering the current high metals prices, how can the government, associations and mining companies work together to ensure that new projects are developed to take advantage of this context?

Metal prices have recovered and this is excellent for the country's coffers, while also mining companies are in a better position to develop new projects. This said, we need to look at the bigger picture, this is where our vision to 2030 as a country and as an industry is key. Peru has an enormous infrastructure deficit and the best way to fund infrastructure investment is through the income provided by mining, generating a virtuous circle for employment and development. Peru's project portfolio in mining is around US\$60 billion, while the infrastructure deficit is worth nearly US\$100 billion.

To what extent do you think the presidential elections in 2021 could impact Peru's mining industry?

There is going to be a lot of noise. The campaign is going to be throwing lots of populist ideas to the public, and most probably the new government will not have control over Congress. The majority of the candidates, though, should be business friendly and whoever is elected will need to have a very fluid communication with the different economic and political actors.

What will be the main themes of the IIMP's ProExplo virtual event in March?

ProExplo is focused on the exploration segment. One of our objectives is that those in charge of public policy understand that exploration is a high-risk activity with a minimal environmental impact. Yet, the permits are similar to what a mining operation requires. If that is not addressed, we will continue seeing a decrease in exploration expenditures, which is highly damaging to a mining country like Peru.

2021 is the 200 year anniversary of Peru's independence. By the end of the year, what changes would you like to see in the country's mining industry?

Peru's geological richness offers huge operations like Cerro Verde, Las Bambas and Antamina, as well as narrow vein operations and artisanal mines. As a country, we need to promote large investments but also formalize the artisanal mining industry that is linked to gold production. It is estimated that half a million people are involved in artisanal mining, and this industry is not paying any taxes and is leaving a wide portfolio of environmental liabilities. This is the greatest challenge that needs to be addressed by the industry. •

Mining Production

Copper production in Peru decreased in 2020, but a rebound is expected in 2021

After three years of steady copper production, when Peru’s annual output averaged 2.45 million tonnes per year (mt/y) from 2017 to 2019, the Covid-induced lockdown in 2020 caused production to decrease by 12.5% to 2.15 million mt/y, according to figures from the Ministry of Energy & Mines (MINEM). Despite this expected drop, figures from October to December revealed production in Q4 2020 was almost identical to the corresponding quarter in 2019, an illustration of the recovery and a positive sign for 2021.

There was a change to the leaderboard of Peru’s largest copper producers in 2020, as Southern Copper Corporation took the top spot (up from third in 2019) with 423,796 mt/y, accounting for 19.7% of the country’s output. As Southern was the only company able to keep producing throughout lockdown, its position should come as no surprise. However, the copper major also benefited from a first full year of production after the expansion of its Toquepala mine. “The new concentrator at Toquepala added 100,000 mt/y of copper contained in concentrates, which represents approximately

“The new concentrator at Toquepala added 100,000 mt/y of copper contained in concentrates, which represents approximately an increase of 30% in our production capacity.”

- Óscar González Rocha,
President & CEO,
Southern Copper
Corporation



an increase of 30% in our production capacity,” revealed Óscar González Rocha, Southern's president and CEO.

Antamina (a BHP-Glencore-Teck-Mitsubishi joint venture) remained in second place, with 396,247 mt/y, followed by previous leader Cerro Verde, the mine operated by Freeport McMoRan in Arequipa,



Committed to the
sustainable development
of our country

www.southernpeaksmining.com



MEMBERSHIP 2021



NEW BENEFITS FOR A NEW ERA



Exclusive Platforms for Members



B2B Meetings (one to one)



Event organizing



Work Committees



Invitation to exclusive events
of the CPCC



Branding



Dynamic networking platforms



On-site and Virtual expositions



New Commercial Platforms and
Digital Opportunities



Canadian Education Programs

CONTACTS:

✉ PATRICIA DEDIOS ✉ LDEDIOS@CANADAPERU.ORG

✉ SOLANGE BLOTTE ✉ SBLLOTTE@CANADAPERU.ORG

🌐 WWW.CANADAPERU.ORG

“The staged expansion at Condestable will initially increase throughput from 7,000 mt/d to 8,400 mt/d, and construction for this stage should be finished in Q3 2021, which will result in a 20% increase in copper production from the mine.”



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

with 387,928 mt/y. Las Bambas, operated by MMG, was the fourth biggest copper producer with 312,776 mt/y. Cerro Verde and Las Bambas both suffered 18.2% drops compared to their 2019 production, in contrast to fifth place Chinalco, which grew by far the most of Peru's top 10 copper producers, reaching 202,771 mt/y, a 6.7% increase from its 2019 mark.

Peru previously experienced sharp growth in its copper production between 2014 and 2017, moving from an annual average of less than 1.5 million mt/y to 2.45 million mt/y. After a period of stability preceding the new decade, and the black swan event of 2020, the beginning of the roaring (or recovering?) 20s sees a near-term pipeline about to come online which will push annual production towards 3 million mt/y. Minsur's Mina Justa operation is expected to start production in April 2021, 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, expected to start production by the end of 2022.

EXPEDITING PROJECT DEVELOPMENT: THE SOCIAL ASPECT

As the copper price moves incrementally upwards above US\$4/lb, free cash flow is expected to fuel expansions, exploration and M&A. In addition to the need to make up for time lost during the 2020 lockdown, there is a certain urgency for Peru to expedite project development and take advantage of the momentum of high metals prices, not only to aid economic recovery, but also because the country's pipeline post-Quellaveco lacks major greenfield projects. Money alone will not be enough to ensure projects are given the green light, as lengthy permitting processes and social tension have resulted in a number of high-quality projects being held back. “The government does not think mining deserves a dedicated State policy, and that damages the industry's prospects. Investment arrives in countries with legal and political stability,” stated Rómulo Mucho, general manager of Pevoex, lamenting delays in major projects.

These projects include Jinzhao Mining's Pampa de Pongo, particularly attractive with iron ore trading over US\$150 per tonne, and the Rio Blanco mine in Piura, which could add over 200,000 mt/y of copper, but mining is pretty much banned in this region of Northern Peru, according to Mucho. Hudbay Minerals' Pampacancha

deposit, near its Constanca mine, has faced community issues, and blockades in the mining corridor in southern Peru have caused a loss of sales worth more than US\$500 million to Las Bambas.

Another of Peru's copper producers with a project subject to a judiciary process is Southern Peaks Mining (SPM) and its Ariana asset. Adolfo Vera, SPM's president and CEO, weighed in on the matter: “Ariana is a project that SPM will definitely build, as I have always maintained, because there is no technical support for any of the claims of those who oppose the project.”

SPM hopes to be able to restart construction by the end of 2021, with production to start by the end of 2022. Vera stated that, once in production, Ariana will be a low cash cost producer in the neighborhood of US\$0.50/lb, adding around 35,000 mt/y copper concentrate to the company's production profile.

In the meantime, SPM has been busy with the staged expansion of its Condestable mine, which will initially increase throughput from 7,000 mt/d to 8,400 mt/d, with construction for this stage due to be finished in Q3 2021. Vera noted that this will result in a 20% increase in copper production from the mine, before adding that the following stage will be to increase throughput to 12,000 mt/d after SPM has prepared a new EIA and obtained the necessary permits.

On the subject of the surging copper price, Vera mentioned that the context gives SPM a robust case for expansion. “This will bring about cheaper capital for brownfield copper projects, and has also stimulated M&A interest,” he said, revealing that SPM is looking at properties in Peru and Chile, and to a lesser extent Ecuador and Argentina, waiting for the opportunity to add another asset to the company's portfolio.

PRECIOUS METALS

Gold and silver production in Peru suffered more in 2020 than the other metals the country produces, falling 32% and 22.5% respectively, according to MINEM figures. The dramatic reduction in gold (from 4.13 million ounces (oz/y) in 2019 to 3.08 million oz/y in 2020) and silver (from 136.17 million oz/y in 2019 to 105.49 million oz/y in 2020) can be partially explained by the majority of precious metals being mined from underground operations, which were impacted more by Covid restrictions than open-pit operations. However, it also follows a trend that has seen precious metals production in Peru decrease for five years in a row.

Fortunately, 2020 was a banner year for precious metals prices, with gold reaching an all-time-high in August, averaging US\$1,769/oz for the year, and silver approaching the US\$30/oz mark for the first time in eight years, averaging over US\$20 for the year. High PM prices and a bullish outlook for both metals is offsetting declining production in Peru, and the news that the country's biggest gold mine, the Newmont-operated Yanacocha, will start construction on its US\$2.1 billion Sulfides project in late 2021, is also a positive. The underground development of Yanacocha, as the mine transitions from oxides to sulfides, represents the biggest single investment in Peru's mining industry in 2021, as well as signaling the move to large-scale underground mining in the country.

Another of the international gold producers operating in Peru is South African major, Gold Fields. The company experienced a 25% drop in gold production at its Cerro Corona mine in 2020, but the operation remains hugely profitable, with the lowest running costs of Gold Fields' global operations.

Luis Rivera, Gold Fields' executive vice president for the Americas, revealed that despite the significant challenges posed by Covid, the company managed to establish a similar production rate it had in December 2019 at its Cerro Corona mine in December 2020. Having previously completed a feasibility study to increase mine life at Cerro Corona to 2030, Gold Fields is currently undertaking a scoping study to extend this further, to 2034. Rivera explained that by using the mined-out pit at Cerro Corona as a tailings dam, the operation has gained extra space.

Rivera also elaborated on operational modifications and optimization work at the mine, including plans to recover the stripping waste in 2021 after activities had been reduced in 2020. The operation also plans to change its grinding circuit and 12-year-old crusher, as well as implementing a gravimetric circuit to recover additional coarse gold that was going to waste in the tailings dam. “With these modifications we will have the appropriate conditions to continue mining deeper and recover additional coarse gold that was going to waste because it was too heavy to be brought into the flotation circuit,” said Rivera.

Meanwhile, on February 16th, 2020, Barrick Gold announced it had reached an agreement to sell its 100% interest in the Lagunas Norte mine in Peru to Singapore's Boroo Pte Ltd for a total consideration of up to US\$81 million, plus the assumption by Boroo of Barrick's closure liability relating to Lagunas Norte of US\$226 million backed by an existing US\$173 million bonding obligation. In 2015, Lagunas Norte was producing over 500,000 oz/y at an AISC of US\$500/oz. However, with its reserves declining and the transition from oxides to more expensive sulfides, the asset is no longer in the company's strategy.



GOLD FIELDS

Covid-19 has caused a significant impact on the mining industry. It introduced us to a “new normal” that forces us to continue on a path to modernization and automation, closer working relationships with our stakeholders and prioritizing our people's health and safety.

In our Americas region, we are committed to being a responsible and innovative mining company that contributes to sustainable development.



 www.goldfields.com.pe

 Gold Fields en Perú

 @GoldFieldsPer



- Ricardo Porto,
President & CEO,
Nexa Resources Perú

Barrick CEO Mark Bristow said the sale was in line with the company’s policy of selling non-core interests to focus on tier-one operations, and for Boroo it offers a platform into a country looking to expand its gold production. Boroo will now have the opportunity to extend the life of Lagunas Norte by accessing satellite resources and adapting the infrastructure.

ZINC REBOUNDS STRONGLY

Zinc production in Peru decreased by only 5.3% in 2020, totally 1.33 million mt/y, thanks to the country’s biggest producer increasing its

zinc output by 34.3% (Antamina’s 491,180 mt/y Zn accounted for over one third of all zinc produced in Peru in 2020). The base metal used to galvanize steel experienced a rollercoaster 2020, dropping to a 5-year low of US\$0.82/lb in March, before rising over US\$1.25/lb in December 2020. This upward trajectory has continued in 2021, with zinc passing the US\$1.27/lb mark in February, buoyed by the prospects of government stimulus packages involving heavy infrastructure spending.

Peru’s second biggest zinc producer, Nexa Resources, saw a 24.2% drop in production in 2020, due to its operations being underground mines, which were slower to ramp up after lockdown than their open-pit counterparts due to government restrictions. Ricardo Porto, president and CEO of Nexa Resources Perú, revealed that the company’s focus on innovation helped Nexa weather the worst effects of the pandemic, and Nexa’s aggressive expansion plans in Peru remain intact. “Peru is without doubt the main area of focus for Nexa as we view it as the mining jurisdiction of the future. The first project in our Peruvian development pipeline is Magistral, which is in the advanced pre-feasibility stage that we hope to finalize in 2021 and take a construction decision,” detailed Porto.

Magistral is a greenfield copper project located approximately 450 km northwest of Lima and 140 km east of the port of Chimbote, in the district of Conchucos, Ancash. Nexa aims to reach a processing capacity of up to 30,000 mt/d of ore at mine, with production expected to start in 2024.

Junior Exploration

A year of two halves sees a revitalized junior segment enter 2021

Although the downward trend in exploration expenditure in Peru continued in 2020, with a reduction of 37.5% compared to 2019, this does not tell the full story. It was a tale of two halves, as the crash in Q2 was followed by a dramatic rise in metals prices in Q3, led by precious metals, before base metals took over. By February 2021, copper’s relentless ascent and silver’s mainstream coverage had spawned a number of new companies and a flurry of drill results. After stage two of Peru’s mining reactivation plan allowed exploration activities to restart in July 2020, gold hit an all-time high of US\$2,076/oz in August, silver approached the US\$30/oz mark for the first time in eight years, and copper reached its highest price for 10 years, trading over US\$4.20/lb in February 2021. The favorable market conditions saw three new junior IPOs in Peru in Q4 2020, with Pucara Gold (TSXV: TORO) and Kuya Silver (CSE: KUYA) going public in October, followed by Element 29 Resources (TSXV: ECU) in December. This trend is set to continue in 2021, with Tier One Silver (TSLV) planning to go public in March, and Sombrero Resources in Q2.

Guillaume Légaré, head of South America at the Toronto Stock Exchange and TSX Venture Exchange (TMX Group), illustrated the uptick in junior activity globally when revealing the annual results of the two exchanges. The number of financings for mining companies on the TSXV and TSX in 2020 increase by 30% in comparison to 2019, equating to C\$2.9 billion equity capital raised for companies that have mining projects in Latam. In Peru, home to the TMX Group’s South American HQ, Légaré praised the stability of the country’s mining sector: “Peru has made great efforts to welcome foreign investments through an open and stable mining regulatory environment, strong fundamentals, and stable macroeconomic indicators.”

The improved sentiment for juniors was affirmed by Jorge Granda, general manager of AK Drilling, who related that his company’s client portfolio in February 2021 was made up of 60% juniors and 40% producers, compared to a 30/70 juniors/producers split in February 2020. Granda attributed this partly to high metals prices, but also because the authorities are starting to align with the mining sector, and the cumbersome bureaucracy that has plagued the industry is starting to be streamlined to expedite drilling permits. “Obviously, there is still work to be done, but it is a step in the right direction,” added Granda.

Ivan Bebek, co-founder and co-chair of Tier One Silver and president and CEO of Sombrero Resources, two new juniors spun out of Auryn Resources, has been working in Peru for over a decade. “A year or two ago, I would have complained about the length of time it takes to obtain permits,” he said, observing the shift that has taken place

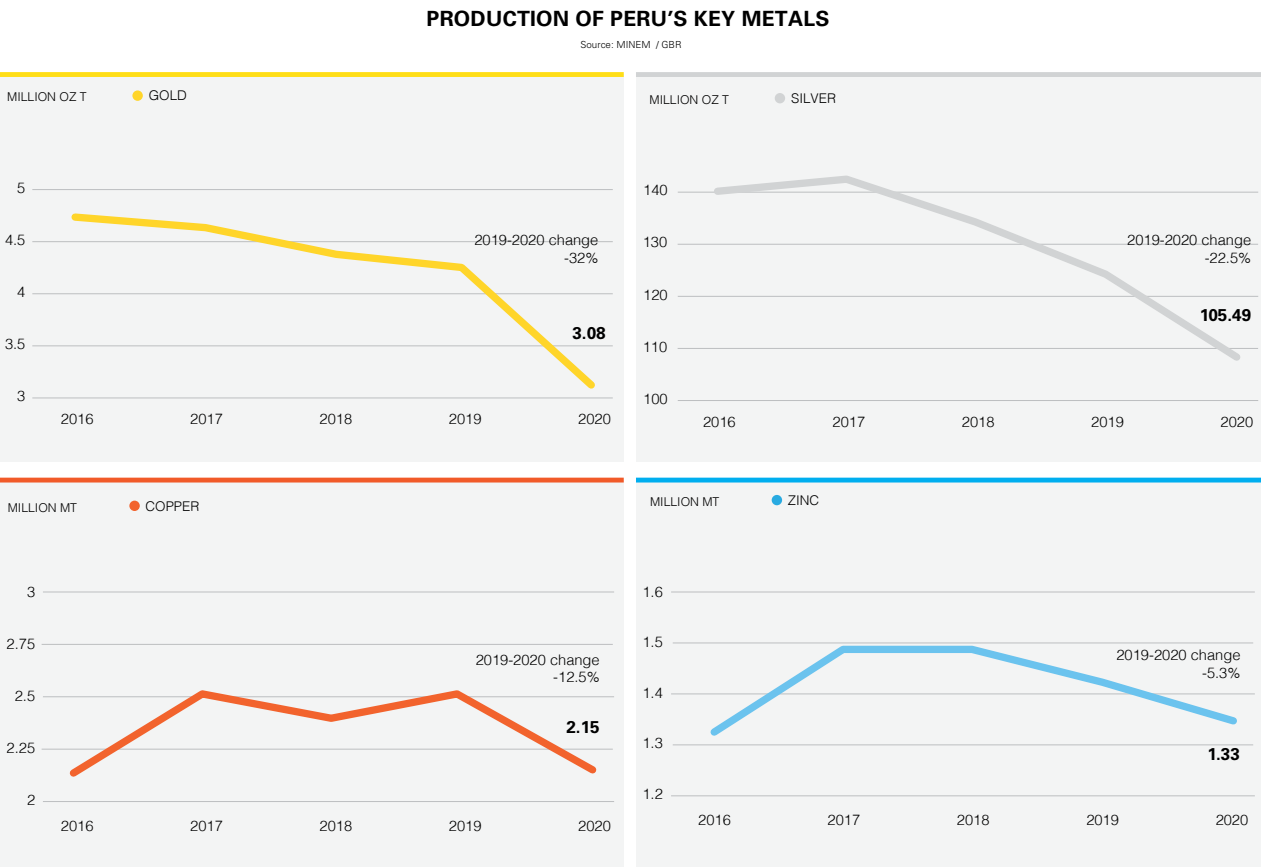
“Peru has made great efforts to welcome foreign investments through an open and stable mining regulatory environment, strong fundamentals and stable macroeconomic indicators.”

- Guillaume Légaré,
Head – South America,
Toronto Stock Exchange & TSX
Venture Exchange



since Covid, with actions backing up the rhetoric of authorities who have vowed to streamline permitting.

“One of the most important adjustments the ministry made was allowing companies to trench without a drill permit, supporting



Exploring New Copper Assets in Peru

- 2 key projects in Peru: Flor de Cobre and Elida
- Experienced leadership team
- Tight share structure
- Catalyst driven 2021 work plan

Contact: Brian Booth, President, CEO & Director
1-888-246-7881, info@e29copper.com
www.e29copper.com

“The prior consultation process means that permits for a declaration of environmental impact take 18-24 months, and local communities end up being consulted twice. These permits take three months in Chile, and in Canada only two weeks.”



**- Enrique Garay,
President,
ProExplo**

early-stage exploration,” mentioned Bebek, revealing that Tier One Silver obtained the FTA permit for its flagship Curibaya project in a period of about five months, on December 28th, while the country was undergoing an impeachment process and dealing with Covid. Although improvements have been made and the positive work of Minister Jaime Gálvez has not gone unnoticed, Peru needs a sustained period of stability to attract investment dollars which have migrated to perceived safer jurisdictions, such as Canada and Australia. Paul Murphy, manager of Mining Plus’s South American office, commented that people working in the junior space often complain of the challenges and uncertainty with regard to the timing of permits and lack of continuity of the leadership within the MINEM. “These people spend a lot of time developing relationships and trust with local communities, and when there are frequent changes in government and ministerial positions it can be a serious challenge to contend with,” said Murphy.

An illustration of how there is still room for improvement came from Enrique Garay, president of the IIMP’s ProExplo event, and SVP of geology for Rio2 Limited. “The prior consultation process that has been put into place means that permits for a declaration of environmental impact take between 18-24 months, and local communities end up being consulted twice. In comparison, the permits in Chile take three months, and in Canada only two weeks.” The ProExplo congress, which takes place every other year, will be held virtually for the first time in 2021, from March 22 to 26, as

exploration companies, investors, prospectors, universities and the general public come together to discuss exploration. The challenges faced by exploration companies in Peru will be addressed on the Thursday and Friday of the event, with the reduction of red tape top of the agenda, according to the president of ProExplo, Enrique Garay.

SILVER OUTSHINES GOLD

On January 28th, 2021, a Reddit subgroup called WallStreetBets sent out a call to buy silver, after the Robinhood trading platform announced it would limit purchases of a number of stocks including GameStop (GME). This so called short squeeze, that caused retail investors to pile in en masse and drive up silver by almost 20% in just three trading days, was different to the GME phenomenon for two reasons. First, silver has solid fundamentals, whether as a safe-haven monetary asset that follows the price of gold, or as an industrial metal used in the production of solar panels and cell phones. Secondly, and more ominously for silver bugs, a short squeeze on silver pits retail up against the likes of JP Morgan, rather than Melvin Capital.

Despite manipulation of the precious metals markets, illustrated by the US\$920 fine handed to JP Morgan in September 2020 for the illegal practice known as spoofing, the outlook for silver remains bullish. A steady price appreciation in response to the impending stimulus package from the Biden administration and increasing demand for physical silver would surely serve the industry better than any boom and bust mania inspired by Reddit and Twitter. “If you analyze what happens in the various bull and bear markets on a micro level, silver outperforms gold during a bull market between 50-100%,” stated David Stein, president of Kuya Silver.

While precious metals have experienced a consolidation period since the highs of August 2020, and fallen somewhat in the shadow of copper, a world still gripped by Covid will require significant fiscal support. In such a context, the devaluation of fiat currency in comparison to gold and silver should continue at pace in 2021.

A new junior poised to take advantage of silver’s momentum is Tier One Silver (TSLV), which was spun out of Auryn Resources in

October 2020, and plans to go public in March, 2021. The company’s flagship asset, Curibaya, is an 11,000-hectare property located in a copper porphyry belt that hosts some of Peru’s largest deposits, including Cerro Verde, Toquepala and Quellaveco. TSLV’s second project, Emilia, sits next to Tía María and is an analogue to Cerro Verde – a massive porphyry system outcropping in a small window on surface. The company is also working towards one more acquisition, expected to be announced in Q2 2021, according to chairman Ivan Bebek.

Elaborating on the mineralization at Curibaya, Bebek described it as a fully preserved precious metal target, the first major epithermal occurrence on this belt, on top of a large porphyry intrusion, with early exploration results including 80 samples on surface that run half a kilo to 300 kilo silver, over a 20 km² alteration system, as well as about 60 samples that range from 2 g/t to 934 g/t gold. Expanding on the potential he sees, Bebek added: “This is one of the largest exploration projects for a precious metal system that I have seen in 21 years in this business. It is remarkable that the entire system has been preserved.”

COPPER JUNIORS

A lack of major development projects on the horizon after Quellaveco comes into production in 2022 has sharpened the spotlight on Peru’s copper-focused juniors. If Peru is serious about making inroads into Chile’s lead as the world’s number one

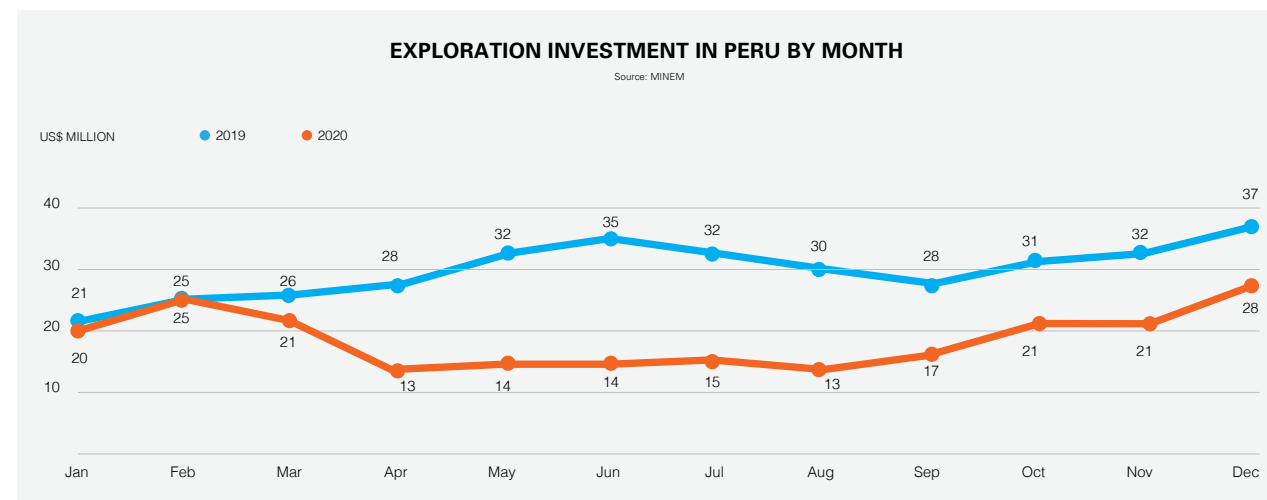
“I speak with the ministers of mines of many countries, and we are clear with the point that our capital will go to the path of least resistance and best risk-reward”



**- Michael W. Scherb,
Founder & CEO,
Appian Capital
Advisory LLP**

copper producer, the country will require more than just brownfield expansions, but significant greenfield discoveries moving rapidly through the exploration and development lifecycle.

Chakana Copper (TSXV: PERU) is currently advancing its Soledad project near Aija, in the Ancash region of the Miocene mineral belt, and achieved a critical milestone during the Covid lockdown in 2020 when it was awarded a permit to drill in the central part of the project area. When drilling recommenced in August, the company was able to make three new discoveries; at Paloma East, a small outcropping breccia pipe which gets bigger at depth; Paloma West, a high-grade breccia with a bigger footprint at surface; and Huancarama, a larger breccia complex with five principal pipes cropping out at surface. David Kelley, Chakana’s president and CEO, explained that these breccias are like fingers on a hand, which, as you go deeper, coalesce into one larger Breccia body, and the ongoing scout drilling



**TIER ONE
SILVER**

PURSUEING WORLD-CLASS SILVER AND GOLD DISCOVERIES IN SOUTHERN PERU

Exploring large-scale silver and gold projects on Peru's prolific mining belts

- ▶ **World-class technical team**
- ▶ **Management has a record of success**
- ▶ **Curibaya Silver-Gold –Flagship Project:**
 - ▶ **Undrilled 20km² alteration system with 80 grab samples over 500 g/t silver and 60 grab samples over 2 g/t gold**
 - ▶ **Mineralization dated Paleocene –equivalent to major deposits such as Quellaveco, Toquepala and Cuajone**
 - ▶ **Drill permit granted –drilling to start Q2 2021**

info@tieronesilver.com tieronesilver.com

TSLV stock listing pending on the TSX-V



Brian Booth,
President & CEO,
Element 29 Resources



David Kelley,
President & CEO,
Chakana Copper



Ivan Bebek,
Co-founder & Co-chair,
Tier One Silver

performed has confirmed that two of the breccias do coalesce at depth on the eastern half of the Huancarama Breccia Complex. Elaborating on the type of mine he envisages at Soledad, Kelley commented that the scale of the mineralization at the Paloma area and the proximity of the breccia pipes, as well as Huancarama's footprint, means that Chakana can start considering the potential for small-scale open-pit mining, which would lend itself to a staged capex approach before moving underground. He added: "This creates additional optionality, which is what mining engineers have always loved about this project. You can put different breccia pipes into production, or multiple zones within a pipe into production." In January 2021, Chakana announced a C\$10 million private placement with Gold Fields increasing its ownership interest to 19.99%. In February, the South African gold producer transacted with another copper-focused junior, Regulus Resources (TSXV: REG), with Regulus signing an option agreement to further consolidate the land position around its AntaKori copper-gold project. In a statement, CEO John Black pointed out that these claims allow Regulus to layback its current resource estimation pit further than it could previously, which should add resources that are already classified but not within the current constraints of the estimated resource pit. The new kid on the block in Peru's copper community is Element 29 Resources (TSXV: ECU), but the company brings with it a wealth of

experience, including president and CEO Brian Booth, previous CEO of Pembroke Copper Corp. E29 was spun out of project generator GlobeTrotter Resources, taking two new assets to the market; the Elisa and Flor de Cobre projects, and putting them into a new shell before competing its IPO in December 2020. Flor de Cobre is a copper porphyry located near Arequipa, close to Chapi and Cerro Verde, which, until recently, had been privately owned. The historic Candelaria resource on the project was drilled in the 1990s by Phelps Dodge, but not developed at the time because it needed to be 1% or better to be feasible as a leach project, according to Booth, who noted: "In today's world, a 57 million mt resource at 0.67% copper, all above 200 meters (m) from surface, is very attractive." E29's other project, Elida, a large property of just under 20,000 hectares, located 170 km northwest of Lima, was drilled by Lundin Mining in 2015. Booth commented on what attracted his team to the project: "When you initially drill porphyries and want to see their significance, you need to see scale. Lundin drilled numerous holes that are 500 to 600 m intersections at good grade copper molybdenum silver, which shows that there is potential for significant volume." Having raised C\$6.7 million to further exploration and development in 2021, Booth outlined the company's plans for the year, which include releasing a maiden resource at Elida, a new 43-101 report

"At the beginning of 2020, AK Drilling was working with more producers than juniors, but this has been inverted, and currently our portfolio consists of 60% juniors and 40% producers. This is not because we have lost work with producers, but because junior participation has really picked up in the last six months."



- Jorge Granda,
General
Manager,
AK Drilling
International

to modernize the historic resource at Candelaria, and resource extension work around both. This will be followed by metallurgical work from the core at Flor de Cobre which will go towards a PEA. The macro theme of a future fueled by copper is also making new management teams revisit old projects, as is the case for Camino Corp. (TSXV: COR), whose president and CEO, Jay Chmelauskas, was drawn to the company's Los Chapitos project because of previous drill results from 2017 that indicated the potential scale and grade for a copper mine. Chmelauskas elaborated on Camino's 2020 drill campaign at Los Chapitos, which included: "Significant intercepts of near surface copper oxidized mineralization at the Adriana zone to add to potential new tonnage for a maiden resource (64.5 m of 0.6% Cu including 12 m of 1.05% Cu)." In February 2021, Camino announced it had increased its mineral claims at its Plata Dorada project to 3,800 hectares, on the back of new high-grade copper silver veins that graded up to 5.76% Cu and 1,500 g/t Ag. "We have also expanded our mineral claims in areas with evidence of historical mining, as this is where we believe that more reconnaissance can lead to more high-grade discoveries," explained Chmelauskas.

TSX VENTURE EXCHANGE STATISTICS: PERU

Source: TMX Group

Number of Mining Financings in Peru (TSXV)

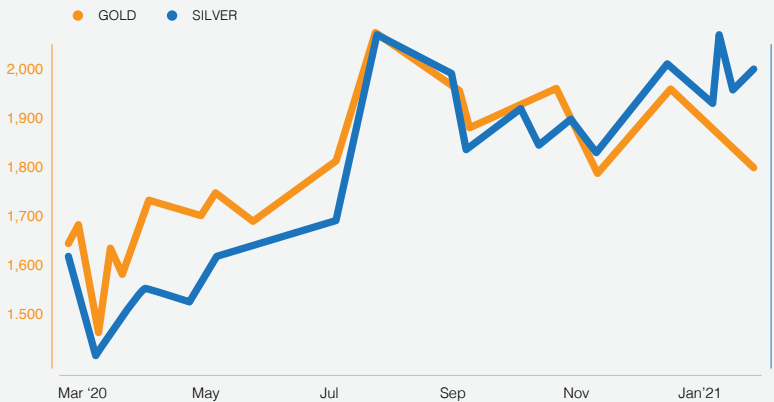
2019 2020 INCREASE
24 → 48 → 100%

Capital Raised (C\$ million)

2019 2020 INCREASE
48 → 159 → 329%

GOLD VS SILVER PRICE CORRELATION

Source: Bloomberg Intelligence



AKD[®]
International

We love what we do!



Diamond Drilling

Directional Drilling

Reverse Circulation
Drilling

Horizontal Drilling

Water Well Drilling

Geotechnical and
Hydrogeology

Submersible Pump
Sales and Service



PERÚ - HEAD OFFICE
AK Drilling International S.A.

Calle Perseo Mz. J Lote 12

Urb. La Campiña

Chorrillos, Lima 9, Perú

Tel: (511) 2513380

Fax: (511) 2511472

E-mail: info@akdint.com

www.akdrillinginternational.com

Engineering, Construction & Consulting

Remote studies and local expertise for brownfield expansions

The majority of the mining value chain suffered during lockdown in 2020, but certain sub sectors were more able to adapt than others. In the engineering space, the move to remote work was more seamless than for boots-on-the-ground contractors, for example, as a laptop-based workforce quickly adapted to home office conditions. In fact, for those familiar with rush-hour Lima traffic, the transition to remote operations came as a welcome development.

"BISA has moved from a large office in Lima to a work-from-home policy, which we have found has really helped the productivity of our workforce," said Federico Schwalb, CEO of BISA Ingeniería de Proyectos (BISA), who revealed that the Peruvian engineering company has decided not to go back to a large office environment, but will use a co-working facility with a smaller capacity in the future. "Even though our revenue dropped 5% in 2020, our EBITDA (Earnings Before Interests, Tax, Depreciation and



Federico Schwalb, CEO,
BISA Ingeniería de Proyectos

Amortization) increased 40% in the same timeframe due to increased productivity and reduced costs."

The pandemic also impacted the type of work mining engineering and consulting houses have been doing. Paul Murphy, manager of Mining Plus's South America office in Lima, mentioned that the workbook of the technical services provider did not decrease in 2020, but demand from clients changed. "A lot of the site-based work dropped off, as

companies were forced to restrict entry from third parties. On the other hand, there was a significant increase in all types of diligence: royalties, M&A, open-cut, underground geology, and geotechnical aspects."

Companies with a strong local presence also benefited from having in-country expertise, as travel restrictions prompted mining companies to contract engineers that could conduct site visits without having to bring in workers from abroad. One such case was Peruvian copper producer Southern Peaks Mining, which awarded a contract to BISA to provide engineering, supervision, project controls and procurement for its Condestable mine expansion, having previously worked on the project with an international firm.

A lack of major greenfield projects on the horizon after Quellaveco, in part due to the permitting difficulties and social issues faced by miners in Peru in recent years, has placed a greater emphasis on brownfield work such as the Condestable expansion.

"Environmental, health, safety, social and technical aspects are growing beyond just compliance and economics. Issues such as carbon footprint reduction, climate change and renewable energy sources must be factored into the life of mine plans, as well as integrating the mine with the needs of local communities."



- Steve Botts,
President,
Santa Barbara
Consultants

It has also prompted engineering houses to offer a wider range of services, such as the Project Management Office (PMO) that BISA has renewed for a third year running with Antamina. A PMO helps provide guidance, raise flags, control costs, and utilize technology to monitor the progress and performance of an operation, explained Schwalb, allowing the mining company to focus on its core business of production optimization.

ESG DRIVES GROWTH

M&A in the engineering and consulting space has continued at pace in recent years, and in 2020, companies that specialize in areas of environmental, social and corporate governance (ESG), were acquired by multinational firms on the back of the incremental rise in demand for ESG-related services.

In February 2020, ERM (Environmental Resources Management) acquired Critical Resource Strategy & Analysis, a specialist sustainability advisory company, having acquired mining consultancy CSA Global the year before. In December 2020, Canadian multinational services firm WSP entered into an agreement to acquire Golder Associates, a global engineering and consulting firm that provides earth

Technical and strategic solutions for the mining industry



Santa Barbara Consultants
www.santabarbaraconsultants.com



PERU'S LEADER IN UNDERGROUND MINING SERVICES



Part of the Breca Group, one of Peru's major holding companies, AESA is Peru's leading integrated underground mining operator, with over 30 years of experience and more than 850 km tunnels built.

Safety is our utmost priority

We transform our area of influence, with a big focus on **training and local employment**.

Wide services portfolio: Drill and Blast, Scalling, Mucking and Transport, Rock Support with Bolt and Mesh, Production and other specialized services such as: Shotcrete, Cable Bolting, Long Hole Drill Rigs, Hydraulic Filling, Ore Transport and Waste.



At AESA, we live by the motto "I care for you and you care for me!"



Web: www.aesa.com.pe **E-mail:** aesaism@aesa.com.pe
Telephone: 706-2230 **Ext:** 2262
Address: St. Las Begonias #441, San Isidro

science and environmental services. In a statement, WSP announced that the acquisition, due to be completed in the first half of 2021, “ideally positions the company’s strategic environment platform to capitalize on ESG trends.”

It is a trend that looks set to continue in the years to come, as ESG has evolved from a token afterthought to become at the forefront of mining strategy. “We will be looking to grow our consulting business, in particular in environmental services, and we are looking closely at potential acquisitions,” stated Zimi Meka, co-founder and CEO of multi-national EPCM company, Ausenco.

Steve Botts, president of Santa Barbara Consultants (SBC), has over thirty years’ experience in the mining industry, holding positions such as VP and managing director of Tahoe Resources Peru, general manager of Marcobre, and VP sustainability for AngloGold Ashanti Americas. In 2011, Botts created SBC to provide mining clients with consulting expertise in the areas of corporate strategy, mining life-cycle and safety, all incorporating ESG considerations, a theme that has grown exponentially in the decade since.

Elaborating on how the topic of ESG has evolved in recent years, Botts spoke of how the management of environmental, health, safety, social and technical aspects within the mining industry are growing beyond just compliance and economics: “Issues such as carbon footprint reduction, climate change and renewable energy sources must be evaluated and factored into the life of



70¹⁹⁵⁰
2020
WWW.KLOHN.COM

For 70 years, Klohn Crippen Berger has participated in some of the largest and most challenging engineering, geoscience and environmental projects across the world. We are proud of our legacy, and continue to build a better world through excellence, innovation and teamwork.

mine plans, as well as integrating the mine with the needs of local communities.”

On the topic of social bottlenecks that have slowed down project development in Peru, Botts listed the number one priority as effective communication: “Mining companies should engage with local communities as early as possible and promote dialogue regarding the community’s long term vision and how a mining project could support this vision; in other words, involve the stakeholders in project planning instead of trying to impose the project.”

TAILINGS MANAGEMENT

In the wake of the Brumadinho tragedy in 2019, the International Council on Mining and Metals (ICMM) conducted a multi-stakeholder review with investors and the United Nations Environment Programme (UNEP), which resulted in the Global Industry Standard on Tailings Management being launched in August 2020.

The investigation, led by the Investor Mining & Tailings Safety Initiative, revealed that around a tenth of tailings dams – 166 of the 1,635 dams studied — have had safety issues in the past. Considering there are over 3,500 tailings dams globally, the challenge at hand will require buy-in from all parties, and not just the major ICMM members. Tom Butler, ICMM CEO, weighed in on the subject: “I have spoken to a number of companies and private equity funds who invest in smaller companies, who have made it clear to the companies they invest in that the Standard must be adhered to.”

Butler also added that the UN has had a lot of interest in the Standard from countries who want to make sure that this is applied.

Dan Etheredge, general manager of Klohn Crippen Berger’s (KCB) South American office in Lima, revealed that 2020 was one of the most active years ever for the engineering firm that specializes in tailings management, and credited the Global Tailings Standard for generating more awareness on the subject.

Etheredge commented that the bulk of KCB South America’s projects are tailings related, such as seismic hazard assessment updates, site selection studies for new facilities, tailings technology trade-off studies, and dam raise designs. He commented on how clients have started taking a more long-term approach in their thinking. “For example, they have 10 years capacity left on their existing facility and want to know what their options are moving forward – do I go to a new facility, or do I raise the dam of the existing facility? Thoughts are also moving more towards lowering risks profiles – instead of having one massive structure with an extreme consequence classification, analyzing the impact of a couple of smaller structures with lesser classifications, or changing tailings technologies to thickened or filtered tailings, for example, to reduce risk.”

Peruvian mining contractor Pevoex has also seen an uptick in demand for tailings work, particularly for tailings dam expansion projects, according to general manager, Rómulo Mucho. “These



Paul Murphy,
GM – South America,
Mining Plus



Dan Etheredge,
GM – South America,
Klohn Crippen Berger



Enrique Sattler,
CEO,
Robocon

projects are highly technical, as they involve a critical facility with associated risks, as seen with the dam failures in Brazil in recent years,” said Mucho, who spoke of the strict criteria for projects including Quellaveco, for which Pevoex is a subcontractor of the company building the tailings dam.

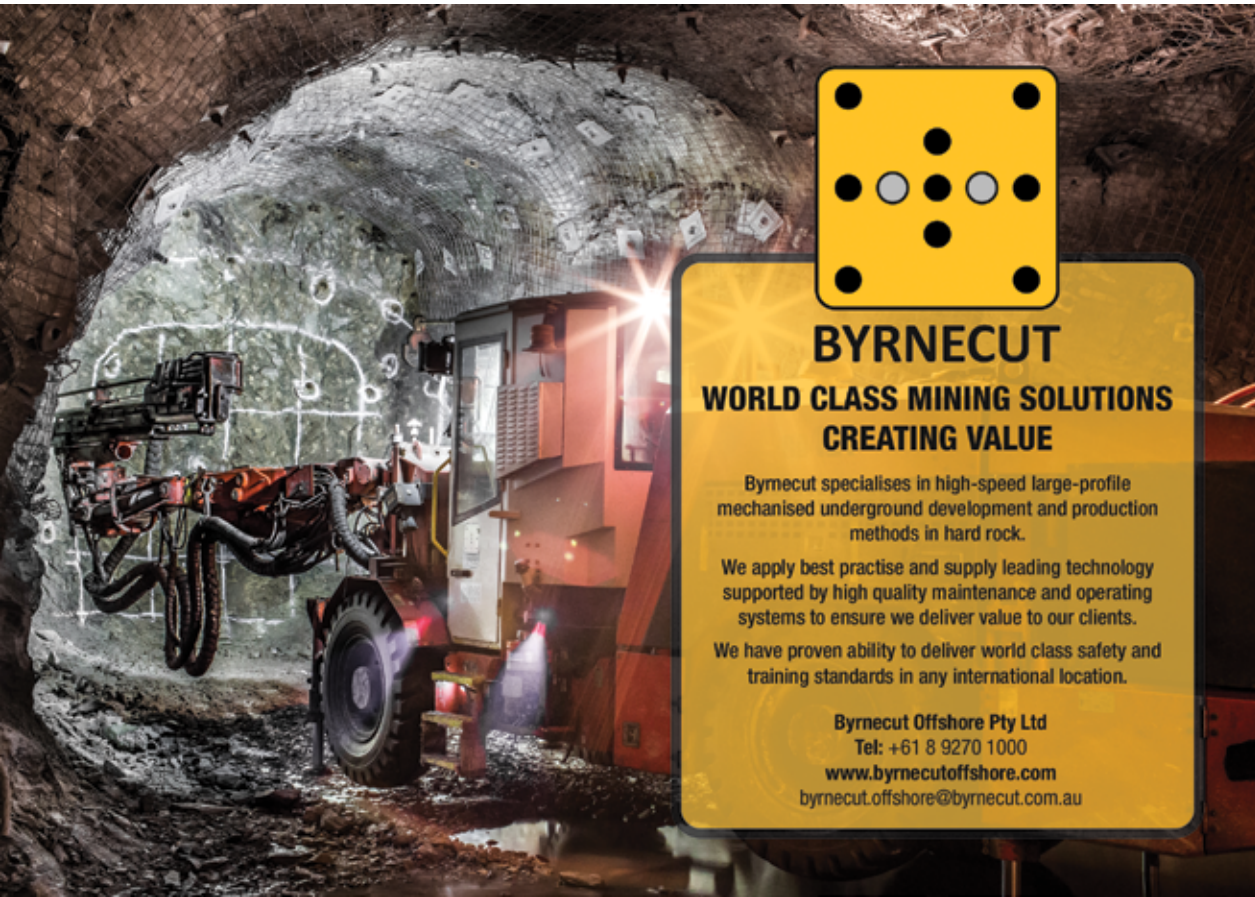
UNDERGROUND MINING TRENDS

“As Nexa runs underground mining operations (where remote work is more

complicated than at open-pit mines), the health and safety protocols that have been implemented mean production is likely to remain at 90-95% for the rest of 2020, as returning to full capacity will probably require a vaccine,” observed Ricardo Porto, president and CEO of Nexa Resources Peru, illustrating the challenges faced by underground miners, but which also present an opportunity for innovation.

Gianflavio Carozzi, CEO of Peruvian underground mining contractor

AESA, suggested that the willingness of mining companies to implement new technologies to achieve greater productivity is now much higher as a result of the pandemic. “The obligated migration to remote work brought down important paradigms and opened our minds to change. This, together with safety concerns regarding concentration of people, encouraged mining operators to reduce personnel footprint at the mine site,” he said.



“Mine operators are now evaluating the benefits that a migration of personnel out of the work front can produce, by expanding productive hours in the mining cycle and increasing safety with the use of remote and/or automated equipment.”



- Gianflavio Carozzi,
CEO,
AESA

Although the move to remote work for some positions started as a necessity, Carozzi suggested that mine operators are now evaluating more aggressively the benefits that a migration of personnel out of the work front can produce, by expanding productive hours in the mining cycle and increasing safety with the use of remote and/or automated equipment.

Paul Murphy, manager of the South American region for Mining Plus, echoed the sentiment that Covid has accelerated the adoption of technology at underground mine sites: “Situations where companies are forced to embrace certain technologies, such as the pandemic, are often the catalysts to show first-hand that there are better ways of doing business.”

Mining Plus’s parent company, Australian underground mining contractor Byrnecut, is targeting growth in the Americas after establishing its reputation as a leading contract miner for large-scale underground projects in Australia and Africa, according to Greg Jackson, managing director of Byrnecut Offshore. The company has a partnership with Peruvian contractor, San Martín, in preparation for the transition to larger underground operations which is taking place in South America. The poster child for such projects in Latam is Codelco’s Chuquicamata, which started underground operations in 2019 to exploit the remaining resources located below the current ore deposit until 2058.

The majority of Peru’s iconic mines in recent years have been open-pit operations, such as Antamina, Las Bambas, Cerro Verde and Toquepala. Underground mining still represents a large portion of production in Peru, but that generally comes from medium-sized operations such as El Brocal, Cerro Lindo and Condestable. However, the construction of Newmont’s US\$2 billion Yanacocha Sulfides project, expected to start by the end of 2021, marks the start of underground mining on a greater scale in Peru.

Mining methods that drive down costs and allow for bulk mining lower grade material, such as large open stopes, sub level caves and block caves, are Byrnecut’s specialty, and Jackson elaborated on the type of opportunities he sees in the Americas: “Yanacocha in Peru, transitioning from oxides at surface to sulfides underground, or Newcrest’s Red Chris in Canada, which could be a large block cave, are examples of the type of deposits that lend themselves to bulk mining methods.”

RAISE BORING AND SHOTCRETE INNOVATION

The amount of small to medium-sized underground mines in Peru has created a sub-segment in the industry where Peruvian companies have established a leading position in the development of machinery and services for narrow-vein operations. Equipment manufacturer Resemin, raise boring contractor Tumi Raise Boring, and shotcrete specialist Robocon can all be credited with innovations in their separate niches that have started to gain international recognition.

Traditionally, raise boring’s purpose is for ventilation of the exhaust of diesel-driven equipment within mines, however, Tumi Raise Boring has developed the raise boring process to put it into the production field, initially because Nexa Resources needed it for slot raising, according to general manager, Marc Blattner. “We designed and have a patent on a semi-automated raise boring machine called the SMB 400 SR, and a bigger model called the SBM 700 SR. The slot raise (burn holes)

“Projects such as Yanacocha in Peru, transitioning from oxides at surface to sulfides underground, or Newcrest’s Red Chris in Canada, which could be a large block cave, are examples of the type of deposits that lend themselves to bulk mining methods.”

- Greg Jackson,
Managing
Director,
Byrnecut
Offshore



that mines use for production are now being done by raise boring machines, which allows for less explosives and therefore less waste,” detailed Blattner, who noted that this brings down the cost, improves efficiency and set up time, and makes the human contact as minimal as possible.

In recent years, Robocon has become a more vertically integrated business to provide a full range of services related to shotcrete, including technology such as slick lines – a piping system that helps transport concrete within a mine. On the topic of innovation, Enrique Sattler, Robocon’s CEO, spoke of how the introduction of laser technology has been an important focus for Robocon: “We specialize in the operation of small machinery and laser technology is an excellent complement to this. Wet shotcrete technology offers considerable benefits in terms of safety and speed, regardless of the operation’s size. In robotics-led operations, risk is minimized and efficiency is increased.”

Sattler explained that the speed of processes is key, especially for mines that rely on small tunnels, because it can contribute directly to profitability, adding: “Laser technology also optimizes operations because it determines the best processes for a given volume and area, and helps verify the correct width of drilling.”

Equipment, Innovation & Services

Covid has accelerated the adoption of technology, but wholesale changes will not happen overnight

The pandemic has unquestionably changed the way we work, however, most of the changes have been to cope with the constraints that Covid has imposed. In many cases they are reactive rather than proactive – Zoom meetings because we cannot meet in person; technical support via video because of travel restrictions. However, it has also accelerated the use of remote-controlled, autonomous systems, which is an important step towards a future which will depend on moving to automated, continuous production systems.

“Disruption is not comfortable, but it is required if real progress is to be made,” reflected Doug Morrison, CEO of the Centre of Excellence for Mining Innovation (CEMI), adding that the inertia that Covid has brought about creates the opportunity to make changes happen – if the will is there.

Marcos Wieland, general manager of Sitech, a Ferreycorp group company specialized in introducing technology solutions to

mining operations, revealed that the company’s initial expectation was that Covid would bring about a new interest in biosecurity and health solutions. However, Sitech found that interest in these topics peaked in 2020, then faded away as work dynamics began to normalize. “What we have observed is an increase in fatigue management, which has come as a result of longer work shifts during the pandemic,” observed Wieland.

Sitech has also noticed an uptick in the adoption of technology that supports remote work, as mining firms are becoming more interested in using tools that allow them to become more efficient without people in the field. Wieland gave the example of a rising demand for remote control centers, noting that while many of these technologies existed before Covid, they have gained more traction during the crisis. “The early adopters of these technologies could potentially serve as a model for other mining companies and trigger a virtuous cycle,” he said, suggesting that,

SECURE, PRODUCTIVE AND EFFICIENT MINING.

THINK DIGITAL

- Fleet Management
- Anti-Collision System
- Productivity Tracking
- Fatigue Monitoring
- Proximity Detection
- Equipment Tracking

GET IN CONTACT WITH OUR EXPERTS

+511 626 5092
WWW.SITECH.COM.PE

SITECH Connect Decide Transform



James Valenzuela,
CEO,
Resemin



Ángel Tobar,
GM – Andean Region,
Epiroc



Giorgio Mosoni,
General Manager,
Ipesa

as more solutions are deployed, it is likely that more people in the mining sector will become aware of the benefits of technology and how it makes processes more efficient. Another company in the Ferrycorp Group, Caterpillar distributor Ferreyros, won contracts to provide equipment for the two standout copper projects in Peru’s development pipeline; Mina Justa and Quellaveco. For the newest projects such as these, state-of-the-art technology is a pre-requisite. Gonzalo Díaz Pró, general

manager of Ferreyros, commented that both mines will feature leading-edge innovation. “Marcobre for Mina Justa is considering using alternative fuels with our trucks, which can switch to operate with liquefied natural gas (LNG), an economic and locally available resource,” he said, adding that Quellaveco is also considering a number of technology upgrades to their fleet, including autonomy packages. While mines such as Quellaveco can be seen as emblematic of the direction the industry

is headed, the reality for most Peruvian mines is that diesel-powered equipment currently offers a more cost-effective option, and still represents the majority of vehicles. However, the transition to electric vehicles is being made through hybrid equipment. Giorgio Mosoni, general manager of John Deere and Wirtgen Group distributor, Ipesa, outlined the range of hybrid equipment his company offers, including loaders and excavators with technology that allows the recharging of batteries during braking

or rotation motions. In 2020, Ipesa expanded its heavy mining machinery fleet from one to three machines in Peru, including two 90-ton Hitachi 870 machines for the Shougang iron-ore mine south of Lima, and a third machine to a gold project in Cajamarca. Mosoni also highlighted the company’s focus on innovation for non-traditional equipment for the transportation of materials: “For example, Ipesa has a Japanese all-terrain machine called Morooka, a rubber track vehicle that allows for greater flotation which works in tin-mines for Minsur.”

UNDERGROUND EQUIPMENT

Incorporating innovation in an underground mining setting is more of a challenge than in the spacious environment of an open-pit operation. Nevertheless, the need to introduce technology in underground operations has arguably been more critical during the pandemic, as strict social distancing rules have limited the amount of workers allowed in a mine.

Ángel Tobar, Epiroc’s general manager of the Andean Region, observed an increasing interest from clients in new technologies, especially automation, digitization and interoperability. “In previous years, automation and digitization both for equipment and processes had been advancing at a steady pace, but as a result of the pandemic both have become an urgent need, in order to keep people protected.”

Tobar noted that the uptick in demand had not only come from those that require new drilling machines, but also in retrofit projects for existing machines, incorporating remote and even autonomous operation functionalities into the equipment. “As an example, Level 6 Automation or Total Autonomy of our production drilling equipment in surface mines allows us to operate our well-known Pit Vipers from hundreds of kilometers away, both from an office or from the operator’s home.”

One of the Peruvian pioneers of underground mining innovation is Resemin, which has gained international recognition for its specialist equipment suited to narrow-vein operations. James Valenzuela, Resemin’s CEO, says his company differs to the big OEMs as it does not focus on full automation, but rather ease-of-use for the operator. He elaborated: “Full automation can make machines less “confident” or reliable, because it requires a lot of sensors, and narrow vein underground mining is the worst environment for this due to the corrosion, humidity and dust.”

Discussing the company’s latest innovations, Valenzuela gave the example of the Dual Jumbo Resemin launched in 2020 after a trial in Kazakhstan, which performs both face drilling and roof bolting. He also revealed that in 2021, Resemin has requested a patent and will launch a brand new system to perform scaling with a jumbo. “Normally this is a hazardous practice because falling rocks destroy the machine, but Resemin’s new T-Pointer system will reduce this risk.”

Nasdaq-listed Astec Industries is best known as a leading manufacturer of equipment for asphalt road building and aggregate processing, however, the company also supplies a wide range of mining products, including underground support vehicles and

“As more solutions are deployed, it is likely that more people in the mining sector will become aware of the benefits of technology and how it makes processes more efficient. In the future, companies will have to move towards technology in order to be competitive.”

- Marcos Wieland,
General Manager,
Sitech



screening equipment. Carlos Fonseca, regional managing director of Astec LatAm, was hired to start the company’s Latin American operations in 2019, where the mining industry accounts for Astec’s biggest client base. Fonseca mentioned the key to success is having robust, well-engineered products, as well as having extensive knowledge on the ground: “For instance, Canadine has been our distributor in Peru for over 30 years, so they have deep knowledge about the products.”

Rexroth, a German hydraulic drive specialist that forms part of the Bosch group, sees potential for growth in the underground space in which it currently participates through underground contractors such as AESA and INCIMMET, or OEMs such as Resemin, for which



Image courtesy of Epiroc

A JOHN DEERE COMPANY

IPESA

Smart Mining Technology

**CUTTING, CRUSHING AND LOADING
ROCK IN A SINGLE OPERATION**

WINDROW AND ROAD IMPROVEMENT

KLEEMANN www.ipesa.com.pe **WIRTGEN**

it supplies components in mobile transport machines and loaders. “In comparison to open-pit mining, underground mining needs more hydraulic equipment per tonne produced. This is especially relevant for mobile equipment, such as drilling equipment,” explained Kai Rothgiesser, Rexroth Peru’s general manager, who added that the service needs are also higher in underground mining because of rough conditions.



Wilson Miranda,
General Manager,
Confipetrol Andina

DRILLING

Despite being one of the fundamental value-creators for mining producers and juniors, drilling was not considered an essential activity during the first lockdown in 2020. However, this sub-segment of the industry rebounded strongly in the second half of the year, and its outlook for 2021 appears as bullish as it has been for many years.

The increase in the participation of the exploration sector is one factor, illustrated by the amount of financings by Peru-focused juniors on the TSX Venture Exchange

doubling from 2019 to 2020, with the amount of capital raised increasing by over 300% in the same timeframe. Additionally, rising metals prices have given the impetus to producers to expand brownfield exploration programs, a point emphasized by Hochschule CEO, Ignacio Bustamante, who commented that he could not remember a time “with so many meters to drill.”

Through its contract with Las Bambas, Geotec has undertaken one of the biggest drilling campaigns in Peru in recent years,

with thirteen rigs working in the Cotabambas region.

However, in addition to the issues MMG has had with reoccurring blockades of its copper concentrates, the pandemic has caused a fear of outside workers coming into local communities. “Mines often mobilize 3,000 to 4,000 people from outside the communities and this is being regarded as a threat due to the health situation,” related Miguel Ángel Arenas, general manager of Geotec.

Moreover, he mentioned that automation will be required to fulfil the uptick in demand for drilling services: “Geotec has been training new workers for several years now, but with the increase in demand for drilling we are seeing, it will probably not be enough, so it will become necessary to automate more processes.”

Jorge Granda, general manager of AK Drilling International, related that his company was focused on compact drilling equipment that is easy to use. “In collaboration with IDS, our technology branch in Chile, we have been developing technologies such as horizontal drilling, deep-pit drilling and automated diamond drilling,” said Granda, adding that, while technology has improved efficiency and productivity, the human element of drilling is still the most important asset. “Remote work has accelerated during the pandemic and this is a good thing, but with certain activities, a level of skilled human intervention is necessary to maintain quality control and ensure safety.”

G&G Perforaciones, a Peruvian drilling services company established in 2007 by a group of students from the National University of San Luis Gonzaga, Ica, has grown its business since gaining its first contract with Buenaventura. Marcos Garayar, general manager and co-founder, explained that, in addition to a full range of drilling services, G&G designs its own equipment to take into account the ESG concerns of an operation. Garayar said: “We are developing technologies that reduce environmental impact, including solutions for water optimization and solutions for the reduction of gas emissions and energy consumption.”

This focus on sustainability is one of the reasons G&G won a large international

tender for a drilling contract at Lundin Gold’s Fruta Del Norte mine in 2020, a milestone for the company which represents its first project outside of Peru. “This kind of technology is being applied in Ecuador in a particularly aggressive way, as Fruta del Norte is in the middle of the jungle, so environmental treatment and especially water treatment is especially important,” added Garayar.

THIRD PARTY SERVICES

Outsourcing has become part and parcel of successful heavy industry for many years, but third party service providers faced a unique challenge in 2020, as companies were forced to reduce workforces to the bare minimum and minimize the number of contractors on site. Labor-intensive jobs such as fleet maintenance are vital to the day-to-day activities of an active operation, but rely on a high level of activity at the mine site.

For Confipetrol Andina, a large player in the industrial third party services space, the pandemic resulted in a temporary reduction to its 4,500-person workforce, as many of the operations it supplied personnel to were not deemed essential. Its services to the petroleum industry continued through lockdown, but despite Peru’s economic dependence on metal production, the mining sector was not as fortunate. However, Wilson Miranda, Confipetrol’s general manager, related that the situation had improved by the end of 2020: “Fortunately today (January 2021), we are back to a higher percentage of working capacity, but social distancing measures

“Geotec has been training new workers for several years now, but with the increase in demand for drilling we are seeing, it will probably not be enough, so it will become necessary to automate more processes.”

-Miguel Ángel Arenas,
General Manager,
Geotec



make it difficult to achieve pre-Covid levels. While sales and profit were down between 5 to 10% in 2020, we expect to grow between 10 and 20% in 2021.”

Having worked for the likes of Nexa Resources, Minsur, Chinalco, Hudbay, Antapaccay and Las Bambas, rising metals prices offer increasing opportunity for Confipetrol to provide its services, so that mining companies can focus on production optimization. Miranda elaborated: “Our third party services include the operation and maintenance of concentrator plants, open-pit equipment, fleet maintenance and underground mine equipment, and taking care of these concerns for mining companies means they can focus on their core business.”



Operation, Maintenance and Asset Management Services for the Mining, Energy and Hydrocarbons Industry.

We have a human talent of over 5000 employees in Latin America, a highly experienced team with a broad knowledge in all of the sectors where we provide our services. Safety, Innovation, Reliability and an Ethical mindset are part of our commitment to Value that we offer in each one of our services. We are looking forward to Partnering with you.

PERÚ - LIMA
Av. Santo Toribio 173, Torre Real 8 -P10
Centro Empresarial, San Isidro
Lima - Perú
+ [51 1] 7106100
comercial@confipetrol.pe
www.confipetrol.com



CONTACT US:

Phone: (01) 313 4160 Anexo 257 / Cell Phone: +51 982 097 019 / E-mail: proexplo@iimp.org.pe



proexplo.com.pe

Follow us: f | t | y | in

Jorge León Benavides
President,
Canada Peru Chamber of
Commerce (CCCP)



"Peru has a significant portfolio of 46 mining projects totaling more than US\$56 billion, many of which are not being developed for various reasons at the speed required and needed..."

What are the CCCP's main priorities in 2021?

We know about the financial problems many companies are facing in various sectors, therefore, our management is focused on providing them with various tools that allow them to get closer to potential clients and replace face-to-face networking opportunities with virtual opportunities. Moreover, we have created new working committees, such as the innovation and technology committee and the gender equity committee, which are added to the mining, energy, infrastructure, social media and sustainability committees.

What is the CCCP doing to promote the Peruvian mining industry, and what can you tell us about your participation at PDAC 2021?

We have created various business platforms that will allow our partners alternative contracting of their products or services in a much more agile and direct way with mining companies. The CCCP also facilitates networking opportunities through one-to-one meetings we generate for our partners. As for PDAC, we are focused on maintaining the activities that Peru has offered year after year, which are highly recognized by executives and global investors.

As PDAC is virtual this year; we have made an effort to build a virtual platform that responds to these requirements, such as matchmaking opportunities organized by the CCCP. This PDAC presents opportunities for everyone from anywhere in the world: not only large mining companies, but also suppliers and SMEs will have the opportunity to be present at the largest global mining convention. We know that physically attending a conference of this level in Canada can mean high costs, so this year's virtual opportunity brings us closer to a greater number of companies.

What are the main issues currently affecting the mining industry in Peru?

The expedition of permits and authorizations that allow mining exploration to start at the appropriate time is an issue that must be addressed. At present, they far exceed the times recorded in other mining countries. Adjustments need to be made to the

Prior Consultation Law so that this is not an impediment to the development of mining projects, which can be postponed for several years. The eradication of illegal mining and the creation of better policies for mining formalization is also a pending task.

The country is witnessing large investments paralyzed by conflicts with the communities and a lack of support from the central government (Río Blanco, Conga, Tía María). Peru has a significant portfolio of 46 mining projects totaling more than US\$56 billion, many of which are not being developed for various reasons at the speed required and needed.

Also, in a year marked by the presidential elections, it is essential that political leaders establish consensus and guarantee an environment of stability, predictability and compliance with deadlines, which will allow for the execution of investments in a peaceful environment that ensures respect for the environment.

How could Peru improve its climate for junior exploration?

The problem in recent years with junior companies is that they did not get sufficient financing. What has to happen is that the large mining companies regain market value, operational capabilities, and become aggressive investment companies in such a way that they lead to risk investment, that is, exploration.

Likewise, one of the tasks that must be carried out by the government to improve the panorama of investments in exploration is administrative simplification, with all the rules and processes being clear and rational. The future of mining depends on exploration, we have to put all our effort into this issue and continue promoting sustainable investments.

What would you say makes Peru an attractive jurisdiction for mining investment?

Peru continues to be one of the most important mining addresses in the world thanks to the volume of its reserves and the sustainability of its economic and legal policies. Furthermore, a good level of debt, dollar stability, international reserves, low country risk and optimal investor confidence are factors that maintain Peru as an attractive jurisdiction for investors.



GLOBAL BUSINESS REPORTS

This publication is a pre-release edition of GBR's full special report on Peruvian mining, that will be published in Q2 2021.

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

www.gbreports.com

Peru Mining 2021 Pre-Release

Senior Project Director: Ben Cherrington

Project Coordinator: Mariolga Guyon

Reporters: Ben Cherrington, Susana Isotupa

Executive Editor: Mungo Smith

Graphic Designers: İnanç Duman, Özgür & Deniz (ads)

Operations Director: Miguel Pérez-Solero

General Manager: Alfonso Tejerina

Cover photo: Courtesy of Southern Copper Corporation