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Mining in the Shadow of COVID-19

Peru acts quickly as the COVID-19 pandemic devastates global economies

With the exception of political turbulence – something the country is accustomed to – 2019 was a year of relative stability for Peru. In contrast to the social unrest and economic instability that upset many of its South American counterparts, such as Chile, Brazil, Argentina and Ecuador, a stable currency and strong fiscal balance sheet had positioned Peru for solid growth above its modest 2.6% GDP appreciation rate in 2019. Mining investment to the tune of US\$6.15 billion, the highest mark since 2015, has been the cornerstone of Peru’s economic health, accounting for 60% of the country’s exports and over 50% of foreign investment. 2020 started on a positive note for Peru as the signing of a "phase one" trade agreement between the US and China on January 15th pushed the price of copper to a nine-month high of US\$2.88/lb. Although cumbersome bureaucracy has threatened the country’s mining competitiveness, the development of large-scale projects Mina Justa and Quellaveco offered a near-term path to substantially increase the production of Peru’s biggest mineral export. By early February, a Chinese dynamic of

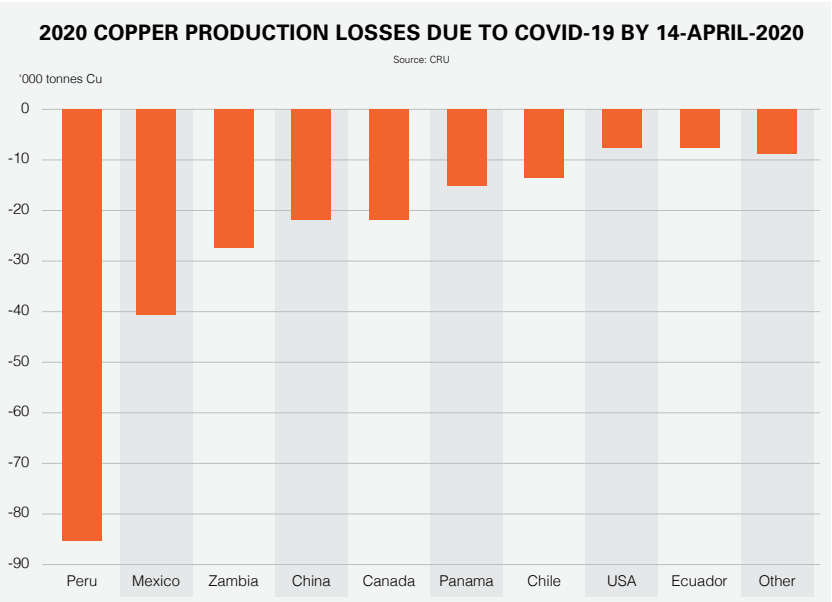


Martín Vizcarra, President of the Republic of Peru

a different kind conspired to send the red metal crashing to US\$2.50lb, a 13% drop in reaction to the escalating COVID-19 outbreak, and a precursor to the freefall in March that saw copper dive to US\$2.10/lb, its lowest point since 2016. In February the supply chain had already been disrupted, as a combination of stringent work from home

(WFO) orders in China weakened demand and shipping companies reluctant to expose workers to the virus created bottlenecks. “Today we have ships that have not been able to unload and there is cargo that cannot be delivered,” observed Juan Alonso Checa, Latam director of Noatum Logistics. While the warning signs were there, few could have predicted the transformational impact of what actually occurred. Despite a 10% drop in attendance and the appearance of hand sanitizer at exhibition booths, the mood at PDAC in Toronto from 1st to 4th March was upbeat, buoyed by a large Peruvian delegation led by new Minister of Energy and Mines, Susana Vilca. Merely one week later, the World Health Organization (WHO) would characterize COVID-19 as a global pandemic and, on 15th March, President Vizcarra declared a country-wide stay-at-home order effectively shutting down the Peruvian economy and leaving only essential services running. Is mining considered an essential service? In the wake of the government’s quarantine measures, the largest mining players in Peru were quick to scale down operations. Anglo

American withdrew the majority of its 15,000-strong workforce from its Quellaveco project in mid-March, maintaining only critical works. “We have now decided to suspend non-critical works for up to three months, thereby providing greater certainty for planning a safe and responsible restart,” stated CEO Mark Cutifani, on April 23rd, before affirming that the company still expects production to start in 2022. At sites already in production, such as Yanacocha (Peru’s largest gold mine operated by Newmont), critical activity such as heap leaching and environmental maintenance continued as operations scaled down. MMG Ltd declared force majeure on copper concentrate supplies from its Las Bambas mine, according to a Reuters report from 9th April, followed by the company withdrawing its 2020 production forecast for Las Bambas on 13th April. “The first quarter was very challenging for the entire business, but particularly for our largest operation, Las Bambas,” said Geoffrey Gao, MMG CEO, in a statement released on 23rd April. On April 26th, Fortuna Silver Mines’ wholly-owned subsidiary, Minera Bateas, announced that six workers at its Caylloma operation in southern Peru tested positive for COVID-19 and have been isolated in a while being monitored by medical personnel. On April 27th, copper mine Antamina, owned by BHP and Glencore, reported 210 positive cases of COVID-19. Worryingly, 87% of the positive cases were asymptomatic, an indication of how easily the virus can spread undetected. The impact was by no means specific to Peru, as a Mining.com study from 6th April reported that the pandemic had cut over US\$280 billion from the market capitalization of the world’s top 50 mining companies in Q1 2020. Peru’s hard stance to ensure the health and safety of its population is commendable considering the country relied on only 200 ventilators at the start of the pandemic. Indeed, the case of Ecuador, Peru’s neighbor to the north, is a stark example of the devastation the novel coronavirus can cause. While Ecuador’s official COVID-19 death toll as of May 7th sat at 1,654, the government reported that 6,700 people died in Guayas province in the first two weeks of April alone, far more than the usual 1,000 deaths there in the same period last year. As the first country in Latin America, and one of the first outside China, to enforce a nationwide lockdown, Peru’s mining industry has felt the economic effects more acutely than other leading mineral producers. According to CRU figures, from 14th April 2020, copper production losses due to COVID-19 stood at 85,000 tonnes (mt) for Peru, compared to 40,000 mt in Mexico, 21,000 mt in Canada, and 14,000 mt in Chile. Despite the bleak short term impact, President Vizcarra was able to act quickly due to Peru’s fiscal strength. According to Bloomberg, the Andean country has accumulated savings in the past decade equal to about 15% of GDP, or 117 billion soles (US\$34.4 billion). The government can spend savings during the peak of the pandemic and tap into bond markets when conditions are favorable. “Investors are taking the long view and rewarding countries that are being proactive in tackling the virus,” said Guido Chamorro, co-head of hard-currency debt at Pictet Asset Management in London, a statement Peru will hope holds true as the country looks to resuscitate its economy in the wake of the pandemic.



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-Gianflavio Carozzi,
General Manager,
AESA

“The coronavirus will change the way we operate and interact. It will change current health and safety protocols in order to preserve social distancing, and it will change the way we staff operations as mobilization will be limited.”

On April 29th, the Peruvian government announced a four-stage reactivation plan designed to open up its economy gradually. From a mining standpoint, large-scale open-pit operations and construction projects of national interest restarted in May. In June, large-scale underground mining (> 5,000 mt/d), medium-scale open-pit mining (> 350 mt/d), greenfield exploration, and worker camps are due to reopen. This will be followed by medium-scale underground mining and greenfield exploration without camps (including processing plants) in July. Finally, in August, the reactivation of the rest of the mining activities will be granted.

On May 6th, Pablo de la Flor, executive director of the National Society of Mining, Petroleum and Energy (SNMPE), stated he expects mining companies to ramp up to around 80% of normal production levels within a month. “We are talking about 39 operations by 22 large mining companies,” De la Flor told Reuters by phone. “These represent approximately 95% of (local) copper production, 65% of silver production, 62% of zinc production and 26% of gold production,” he added, noting that the near-paralysis of mining production and the fall in metal prices globally has led the SNMPE to project a drop in the value of mining exports in 2020 of between 15% to 20%.

THE INDUSTRY RESPONDS

“The lockdown on 15th March caught the mining industry by surprise,” stated Víctor Gobitz, new president of the Peruvian Institute of Mining Engineers (IIMP) and CEO of Buenaventura, Peru’s largest precious metals company.

In his interview with Global Business Reports, Gobitz spoke of the peculiarities the sector presents, with isolated camps where miners work and live on shifts that are typically 14 days long, with seven days off. “To adapt to the pandemic, these shifts could be extended to 30 days work and 15 days off, or to even longer periods like in the 1990s, if the mining workers agree,” he suggested, adding that extended shifts will become the new norm when the industry reopens during 2020, with very strict protocols to control people and cargo movement.

On 15th April, the Peruvian government approved the protocol to move personnel to mining operations through Ministerial Resolution No. 111-2020-Minem. This includes personnel from mining or production units that have completed their workday in accordance with a special labor regime or have complied with mandatory social isolation, in order to return to their residence or place of work. In addition, Article 2 of the ministerial resolution specifies that the interprovincial transport of passengers by air can be granted by the General Directorate Civil Aeronautics for the operations of air cargo transport, special air transport, air work and other activities of civil aeronautics.

For mining contractors, those in charge of large workforces at mine sites, the COVID-19 pandemic will have a significant and permanent impact, according to Gianflavio Carozzi, general manager of AESA: “It will also present opportunities to introduce change at a faster pace as we have had to react (by necessity) to cope with the crisis and as such, have brought down paradigms such as remote work and the use of technology.”

Elaborating on the practical changes that will need to be implemented at mining operations as production is ramped up, Carozzi summarized: “It will change the way we operate and interact.

It will change current health and safety protocols in order to preserve social distancing, and it will change the way we staff operations as mobilization will be limited.”

What could these safety protocols be and how will they be measured? Professor Neil Ferguson of Imperial College London has said that a significant level of social distancing could be necessary until a vaccine is found, which optimistic estimates envisage is at least 18 months away. As lockdown restrictions are loosened and mining companies ramp up production, monitoring employee behavior for larger workforces will be paramount to mitigate risk. With this in mind, Canadian startup Minetell has created an enterprise SaaS (software as a service) platform that measures and monitors COVID-19 risk exposure and control performance, and is offering a 60-day free trial to help essential service workers during the height of the pandemic.

“Our platform delivers actionable and reliable information into the hands of decision-makers so they can ensure their workplaces are safe for their employees and their families, contractors and community partners,” explained Michael Hartley, CEO and founder of Minetell, who added that the remote deployment model the company has been using since its inception two years ago means it does not have to adjust to the current context.

Another company helping mining companies during the lockdown is Micromine, offering free licenses to its software for the month of April, as well as free online training. “In one day, we had 1,500 requests

for licenses globally,” said Guido Perez, Micromine’s Latam and US regional director, remarking that the company had developed a strategy to implement its Pitram solution remotely without having to go to site.

As companies use the current context to invest in training and plan for the post-COVID landscape, the need to recover lost production could present opportunities for service providers, according to Fernando Samanez, VP mining equipment and sales for the Pacific Rim at Metso. “When things restart and ramp up, there could be a lot of opportunities as mining producers look to compensate for lost production by increasing throughput,” he reflected, adding: “When plants are restarted and looking for 5% more throughput, for example, new technology will have to be implemented.”


THE NEED TO STIMULATE EXPLORATION

While mining producers have had to adjust their yearly production forecasts in light of the WFO order, Peru’s junior community is dealing with new challenges that have compounded the already daunting task of advancing projects in a country that has seen exploration budgets decrease for the previous three years, dropping 13.5% from US\$413 million in 2018 to US\$357 million in 2019. Even before the pandemic, the leading authorities in Peru’s mining industry were vocal in their acknowledgement that the climate for exploration must become more attractive if Peru is to maintain a healthy project pipeline.

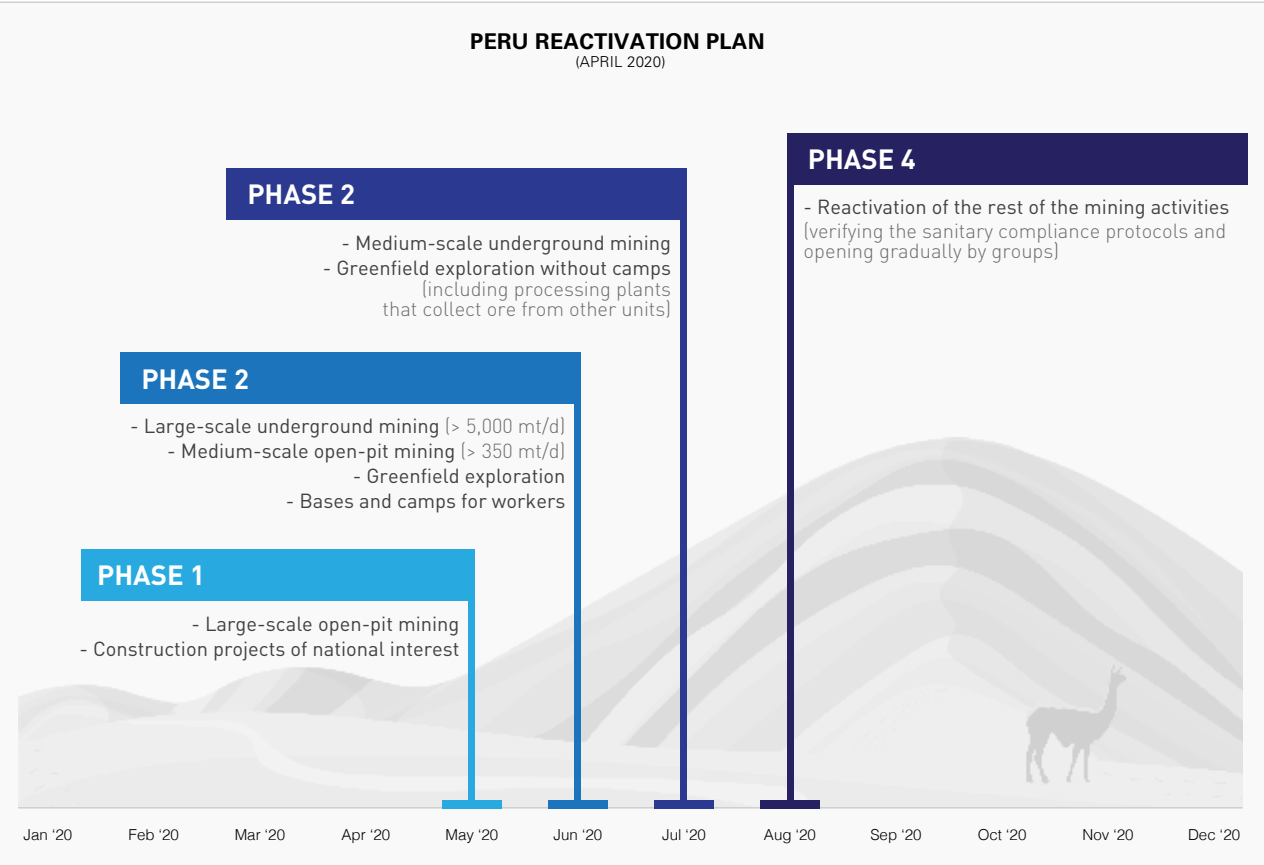
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Manuel Fumagalli, president of the National Society of Mining, Petroleum and Energy (SNMPE), said: “Permitting times and regulations have increased in the last decade, and as such the country has lost competitiveness,” also commenting that the SNMPE is working with the government to streamline the permitting process, as the discussion to move the ILO 169 public consultation (consulta previa) from the exploration stage to the feasibility mining project development stage, gathers pace.

“The government needs to see where there is potential and act quickly, because investors are tired of waiting two or three years to know if there really is potential and cannot continue to invest if they are uncertain there will be a sufficient or a timely ROI,” stated Jorge Granda, general manager of AK Drilling, who remarked that by losing these opportunities, Peru loses its competitiveness and funds go to other jurisdictions.

If the urgency to expedite the excessive bureaucracy was already apparent before the COVID-19 outbreak, the abrupt halting of one of the key value-creating activities of the exploration process – drilling – has added further delays to project advancement. Furthermore, those still waiting for drill permits have seen their meetings with the Ministry of Energy and Mines (MEM) put on hold.

In March 2020, Magnitude Mining entered into a definite agreement for a qualifying transaction with private company Pucara Resources, with the new entity of Pucara looking to list publicly once permits are in hand. “At PDAC 2020 we received notice from the MEM that their first workshop with Pucara was scheduled for 28th March, however, due to the national lockdown to minimize the spread of COVID-19, this workshop was delayed,” related Steve Zuker, Pucara’s president and CEO.

Zuker went on to say that Pucara expects no community opposition to its proposed exploration drill program, but until the workshop has been completed the company cannot define a date to go public. For those with permits already in hand, such as Regulus Resources, the lockdown has prompted a shift in focus with drill programs

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



postponed as operational and corporate teams work together online on tasks to further understand the geology, engineering and economics behind their projects. In the case of Regulus, being able to advance this work means the company is considering bringing forward the PEA for its AntaKori project to early 2021, according to CEO John Black. “When these crashes happen in the markets, like we have seen in reaction to COVID-19 and we saw in the global financial crisis in 2008, for juniors it really highlights the importance of having an excellent project, experienced management team and access to capital to come out the other end,” reflected Black.

Another well-funded junior poised to weather the current storm is Tinka Resources, which raised C\$18.5 million in January 2020 through a strategic partnership with Buenaventura, who bought a 19.3% stake in the company at a remarkable 100% premium to the share price when it was announced. Discussing how the current crisis could impact the markets moving forward, Tinka CEO Graham Carman commented: “On the positive side, there will be a reduction in supply from the shutdown or production cuts at many operations, which will mean base metals prices should recover quicker once we get back to more normal supply-demand conditions.”

One of the potential silver linings to emerge from the post-pandemic landscape should be the elevated role that the mining sector will play in reviving global economies, especially in countries such as Peru that rely on the taxes and royalties paid by metals producers. Furthermore, the need to stimulate depressed economies could lead to streamlined permitting processes. “The pandemic will emphasize the importance that the mining industry has to Peru's economy and in the communities in which we work,” suggested David Kelley, president and CEO of Chakana Copper.

Prior to the shutdown, Chakana completed a detailed ground magnetics survey, and is currently interpreting the survey's results to further its understanding of the geology at the Soledad project. The current context has also created a climate ripe for M&A activity in the precious metals space, as gold broke the US\$1,700/oz barrier in April, causing shares prices of producers and royalty companies to spike after a brief dip in mid-March. On 14th April, news that Barrick had entered into an option to acquire a 70% stake in Golden Minerals El Quevar project in Argentina should alert the South American junior community that high potential projects are becoming attractive options for cash-rich producers looking to buy at an opportune time.



Manuel Fumagalli
President,
National Society of Mining,
Petroleum and Energy
(SNMPE)



What is SNMPE's perception about the Peruvian mining industry in 2019?

2019 was a challenging year, notwithstanding having achieved over US\$6 billion in mining investment. About 40% of this investment was sustained solely by three major projects which started construction back in 2018 – Quellaveco (US\$5.3 billion), Mina Justa (US\$1.6 billion), and the Toromocho expansion (US\$1.3 billion) – highlighting the importance of developing new projects. Unfortunately, no new large-scale mining project began construction in 2019, and exploration investment decreased once again. In 2019, there were some US\$356 million invested into exploration, around 14% less than in 2018. To maintain a sustainable organic growth of Peru's mining industry, we must grow exploration to find new mining deposits, develop the existing country project portfolio to bring into production the future mines, and improve the competitiveness of Peru to attract more investment.

How can the issue of lengthy permitting times be improved?

Permitting times and regulations have increased in the last decade, and as such the country has lost competitiveness. The SNMPE is actively working with government to streamline the permitting processes, cognizant of the importance of attracting investment to the country, while at the same time maintaining the high standards the mining industry has. Due to the importance of fostering exploration, it is currently under discussion to move the ILO 169 public consultation opportunity from the exploration stage to the feasibility mining project development stage.. There is a lot of interest in Peru due to its geological potential and economic stability, but we need to iron out the regulatory permitting challenges that remain as soon as possible.

Why do you believe there have been social tensions with some projects, and what could be done to ease these tensions?

Data shows that approximately 30% of social conflicts arise from unmet expectations in connection to, and the lack of, public services and infrastructure in the remote areas where mining takes place. Another major cause of conflicts comes from negative perceptions about the mining industry and the absence of correct information about our activities. To help ease the social tensions from public services demands, the government has the responsibility to timely provide the same and build the required infrastructure. The mining sector contributes large sums of money through royalties and taxes, and the government must ensure this capital is directed towards this objective for the benefit of local communities. Closing of social gaps will surely diminish, in a big percentage, social conflicts. Social tension can also be eased through proper communication about formal modern mining activities to communities, by both the government and industry.

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



How is the state of emergency affecting Peru and the mining industry in particular?

From a health perspective, the crisis caught Peru in a precarious situation, as at the beginning of the pandemic we only had 200 respirators; as of mid-April there are 500 respirators in the country, and around 143 are being utilized. Additionally, we do not have enough COVID-19 tests, hence there is not sufficient information available on the main contagion trends.

The lockdown on March 15th caught the mining industry by surprise. The sector presents its own peculiarity, with isolated camps where miners work and live on shifts that are typically 14 days long, with seven days off. To adapt to the pandemic, these shifts could be extended to 30 days' work and 15 days off, or to even longer periods like in the 1990s, if the mining workers agree. Extended shifts will be the new norm when the industry reopens during 2020, with a very strict protocol to control people and cargo movement.

Would it be very difficult to extend these protocols to all suppliers and contractors?

Surely, the mining industry cannot operate as a fully isolated entity. On top of energy supply, it needs cement, chemical reagents, explosives and many other elements; while the final product, be it concentrate or cathodes, needs to be sent out to the markets. I think we will see a consolidation period whereby mining operators will try to work with less contractors. In any case, contractors should be able to follow the same shift model as the mining operators themselves.

How can the State protect its citizens considering the high levels of informality in Peru?

Just looking at the mining industry, informal gold mining employs around 500,000 heads of family, which is a very large number. Surely, it has continued to operate during this crisis. Only by increasing productivity will these people be persuaded to join the formal system. If we achieve that, formalization will create a virtuous circle, as these miners will have access to credit, they will be able to buy new equipment and develop as entrepreneurs.

Will this crisis accelerate the introduction of new technologies to increase automation?

In this moment, people is our first priority; the second priority is keeping the essential care and maintenance on our sites; the third priority will be to restart mining operations; and just when we have a stable operation, we will look at new technology and efficiency measures. Right now I do not think it is the right moment to incorporate disruptive changes that would involve big job losses. The adoption of new technology will have to happen step by step.

The Social Aspect

Social tensions must be eased to expedite project development

On January 29th, President Martín Vizcarra announced that Southern Peru's Tía María 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. On January 30th, further evidence of the fractured relationship between local communities and the mining industry arose, as MMG halted copper shipments from its Las Bambas operation following a road blockade led by indigenous farmers and laborers known as comuneros, protesting against the alleged ongoing pollution of their lands. In previous months, Glencore's Antapaccay, Freeport-McMoRan's Cerro Verde, and Hudbay Minerals' Constancia had all been affected by local opposition.

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 comprehensive to be explained, and the challenge is to show the benefits the industry can provide to improve the quality of life to the inhabitants 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." For Jorge Chávez Blancas, general manager of mining consultancy EnvPhys, it is important that the industry and the government work together to increase the acceptability of mining in Peru. "Normally a percentage of mining in the GDP or amount of taxes paid by the mining industry is used to explain the positive impacts of mining; nevertheless, the normal citizen feels these concepts as abstract and not related to their day to day activities," he said, suggesting that the positive impacts of mining should be reinforced and explained to the people in innovative ways: "More effective would be the contribution of mining in people's pension funds, salaries, or how much taxes would have to be increased if the mining industry stops."

The public perception of mining was also touched upon by Marcial García, partner and mining lead at EY Peru, who believes that opposition to the mining sector is not solely driven by concern for the environment, but also for political reasons. "The public should also be aware that mining industry pays more taxes than any other sector in Peru," said García, adding: "Since 2011, mining companies pay an overall tax burden that goes from 42% to 52%, depending on the profitability level of the mine."

To deal with anti-mining stigma, 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.

For Steve Botts, president of Santa Barbara Consultants, the social and environmental issues surrounding a project can actually benefit mining companies, as they offer the chance to show tangible actions rather than the usual corporate rhetoric. "Although many mining companies look at this as a challenge, the conservation of biodiversity can represent a big opportunity, as it gives the company a chance to put their values into practice," said Botts.

MAINTAINING PERU'S PROJECT PIPELINE

With a lack of major greenfield projects on the horizon after Quellaveco, which is expected to move into production in 2022, projects currently in the pipeline such as Bear Creek Mining's Corani silver-lead-zinc deposit in Puno have taken on elevated importance. Furthermore, in light of the need to revive the economy in a post-pandemic landscape, project development should become a priority. On a micro level, for the regions that host the projects, the importance can be fundamental, a fact illustrated by the National Institute of Statistics (INE) declaring Puno as the poorest district in Peru. "Mining Canon (amounting to 50% of income tax, transferred to the regions and areas of influence of projects) has been decreasing in recent years, mainly due to the lower contributions from Minsur's San Rafael mine related to lower metal prices as well as production. The direct and indirect revenues to local communities from a project the size of Corani will have a transformational impact in the region," stated Elsiario Antúñez de Mayolo, Bear Creek's COO & general manager.

The successful development of mining projects in Peru often depends on early-stage engagement with local communities. In 2012, Common

Ground Consultants did a review of the Corani region and made recommendations to Bear Creek as to the type of social programs the company should implement. These recommendations were expanded upon by Andres Franco, VP corporate communications, who elaborated how Bear Creek is working towards the diffusion of information by educating the local population on the project's environmental impact: "Selected community representatives were enrolled in an intensive program that covers the Environmental and Social Impact Assessment, or 'EISA'," he explained, with the training covering such topics as use of chemicals and the milling processes. "These people now have extensive knowledge about the ESIA and are qualified to, and have been engaged to, explain environmental matters related to the Corani project to community members and visitors," Franco added, noting that such an initiative stimulates community engagement and provides a high level of transparency, and at the same time mitigates any risks that stem from a lack of knowledge about the impacts of the project.

Bear Creek contracted Common Ground to undertake a follow up social review in 2019, and their findings highlight an important point occasionally overlooked when considering the dynamics of the relationship between mining projects and communities – once the locals are on board, they expect work to go ahead. "Common Ground's December 2019 report showed that we have done an excellent job in earning social license, but their one area of concern is that the people want the mine to be built and are waiting for us to start work to further improve their lives," observed Anthony Hawkshaw, Bear Creek's president and CEO.

This sentiment was echoed by Ulises Solís, general manager of Macusani Yellowcake, the Peruvian subsidiary of Plateau Energy Metals, who spoke of the issues presented by the prior consultation process from an exploration standpoint: "The social permission of the communities can sometimes expire because one of the commitments is to give them work, for which we cannot guarantee until we have the permit."

One of the causes of these delays, according to Chávez Blancas of EnvPhys, is that the number of regulations and agencies involved



Anthony Hawkshaw,
President & CEO,
Bear Creek Mining

have increased over time. "A common problem is the different evaluation criteria and interpretations of the authorities regarding legislation and technical requirements for mining projects. The criteria can be different, not only between agencies, but also between the professionals in the same agency," he explained, suggesting that the evaluation criteria for permitting should be standardized and that the regulatory framework should be extensively simplified to achieve a more predictable permitting process.

For Xennia Forno, partner at Peruvian law firm Estudio Rubio Abogados, simplifying the requirements should not be understood as a lack of concern for environmental and safety regulations. On a positive note, Forno has noticed acknowledgement by the authorities that the processes must be streamlined: "The most important thing now is that the government is aware that the delay in obtaining and granting permits is a barrier to mining investment, especially for exploration. It is clear that there is an urgent need to push exploration for new discoveries."

Indeed, this urgency will be compounded by economic devastation caused by COVID-19, and one of the lessons to be learned from the pandemic should be the benefit of acting quickly, something the Peruvian government has received widespread praise for due to its decisive action in March. "I am hopeful that the coronavirus crisis and its dramatic impact on the economy will prompt the right reaction by the government, so that the exaggerated approach towards prior consultation is changed," reflected Oscar Díaz, CEO of Viceversa Consulting, adding: "In this recessive scenario, we need the government to take bold, disruptive actions to facilitate investment."



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Mining Production

Peru has a platform to increase copper production when lockdown measures are lifted

Before the COVID-19 pandemic grounded the majority of Peruvian mines to a halt, save for essential measures such as heap leaching, processing and environmental care and maintenance, Peru had experienced three years of stable copper production. In 2019, 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), 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 million mt/y in the years previous, this period of stability preceding the new decade was expected to be followed by growth. While it is hard to predict the full extent of the damage caused by the novel Coronavirus, a robust near-term pipeline of expansion projects, anchored by two high-profile greenfield projects – Mina Justa and Quellaveco – give Peru a solid platform for growth when operations are able to ramp up.

In 2021, Southern Copper’s Toquepala expansion will see its first full and uninterrupted year of production; Minsur’s Mina Justa operation had been expected to open by the end of 2020, but a realistic timeline should now be Q1 2021, bringing a mine online 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. In February 2020, Hudbay Minerals secured a surface rights agreement with the community of Chilloroya for the Pampacancha satellite deposit located near the company’s flagship Constancia copper-gold mine, the lowest cost open-pit sulphide copper mine in South America according to Hudbay. At the time, Hudbay announced it expects to be mining ore

from the deposit in late 2020, but quarantine measures could push this back to early 2021.

Cerro Verde, the mine operated by Freeport McMoRan in Arequipa, remains the largest producer of copper in Peru, with 473,980 mt/y (2019 data), 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 2019 which prevented the transportation of concentrate from the site to the Matarani port, followed by further a 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, Apurimac 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



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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 5.78 million mt/y would require numerous district scale projects to move into production. Before the Coronavirus outbreak, The Ministry of Energy and Mines (MEM) had 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 Tia 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 is doing, and I believe that the government should step up to educate and inform the country of the importance of mining."

"Once the non-sensical claim is rebuffed, the Ariana project is approximately 18 months away from being completed," said Vera, who went on to detail the progress made by Southern Peaks in 2019 by reinterpreting the geology of its Condestable flagship asset, increasing the life of mine significantly. "In 2019, we were able to

"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."

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



multiply resources by 2.4 times and we are expecting to see an 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.

PRECIOUS METALS

From a price perspective, 2019 was an outstanding year for gold producers, and apart from a dramatic dip which saw the precious metal drop by US\$200 in 10 days in March 2020, the bull run has continued at pace, with gold reaching US\$1,726/oz in April 2020, its

highest point since November 2012. While global political instability from the US feud with Iran and a fractured European Union stoked the price in January, the decision by central banks to print vast sums of money to revive economies, and expected inflation that should ensue, has created a perfect storm for the safe haven asset to flourish.

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 precious metals producer, 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, Tantauatay 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 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, who are advancing the Ayawilca zinc project.

Buenaventura's debottlenecking process across its four main operations continued in 2019; the simplification of the metallurgical process and optimization of mine

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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.

Meanwhile, Gold Fields continued its growth in South America in 2019 with the advancement 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 eq/y), and our objective is to acquire another asset to reach a 500,000 oz 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

“The Yaurichocha mine is now fully mechanized. We also completed the Yaurichocha tunnel which connects all of our underground workings with the processing facility. We installed a welded rail line so that trains can travel at a higher speed and we are purchasing larger locomotives and haul cars to allow us to move waste and ore faster.”

**-Igor Gonzales,
CEO,
Sierra Metals**



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. “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 and descending to a 5-year low of US\$0.82 on March 25th, as the Coronavirus outbreak decimated demand. Before the pandemic-enforced lockdown, diversified metals producer Nexa Resources expected that operational performance

would partially offset market-related factors, according to CEO Ricardo Porto, who stated that “Peru is the main growth platform for Nexa”. However, Nexa Resources dropped its 2020 guidance as President Vizcarra announced an extension to the nationwide lockdown in April. Operations were halted at the Cerro Lindo, Atacocha and El Porvenir mines, with activities at a minimum to guarantee maintenance and safety. To combat the crisis, the company announced it has managed its liquidity position by adding US\$650 million to its cash balance through the assumption of US\$350 million of additional debt in March, and fully drawing down its revolving credit facility of US\$300 million in April.

Another of Peru’s mid-tier zinc producers is diversified precious and base metals company Sierra Metals, with production from two mines in Mexico and its flagship Yauricocha underground mine in Yauyos province, Peru. Igor Gonzales, Sierra Metals’ CEO, elaborated on the operational improvements made at Yauricocha: “The Yaurichocha mine is now fully mechanized. We also completed the Yaurichocha tunnel which connects all of our underground workings with the processing facility. We installed a welded rail line so that trains can travel at a higher speed and we are purchasing larger locomotives and haul cars to allow us to move waste and ore faster.” Despite the impact of COVID-19 in March 2020, Sierra Metals Q1 2020 production results released on April 15th featured an increase in production for all metals. Furthermore, the operational improvements at Yauricocha were made in preparation for the company’s asset to increase capacity by 20%, bringing the mine from 3,000 mt/d to 3,600 mt/d by 2021.



Photo Courtesy of MMG Las Bambas

Junior Exploration

How will explorers weather the COVID-19 storm?

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 (Canada, USA, Mexico, Peru and Chile). Buoyant metals prices in early 2020 offered fresh hope for downtrodden explorers; hope which was soon dashed by the COVID-19 wrecking ball that caused commodity prices to tumble and drilling programs put on hold. The S&P Global Market Intelligence Exploration Index dropped to a 4-year low on April 16th, with pipeline activity, metals prices, drill results, financings and initial resource announcements all decreasing in March.

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 – a 13.5% decrease. As permitting issues have thwarted the plans of Peru’s junior community and delayed drilling campaigns, finance has also migrated towards jurisdictions that are considered safer investment prospects.

Paul Murphy, manager of the South America region for technical consulting firm Mining Plus, has noticed the worrying trend in junior activity: “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.

“The government needs to see where there is potential and act quickly, because investors are tired of waiting two or three years to know if there really is potential and cannot continue to invest if they are uncertain there will be a sufficient or a timely ROI.”

**-Jorge Granda,
General Manager,
AK Drilling**



Fernando Pickmann, partner at global law firm Dentons and president and COO for Regulus Resources, believes there is a double liability for why permits have been taking so long: “Some of the delays are due to a lack of capacity to grant permits, but some of the responsibility must also fall with the companies looking for permits who have not been doing the proper work,” he said, observing that instead of following the prior consultation process, companies have been looking for ways to avoid it. Speaking with Susana Vilca at PDAC during Global Business Reports’ Peruvian Junior Tour, Pickmann related how Peru’s new Minister of Energy and Mines had explained that the government is aware of the delays and is trying to reduce bureaucracy to streamline processes. This point was emphasized by Vice Minister of Mines, Augusto Cauti, who commented that stimulating exploration is a key government objective in 2020. As evidence



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Steve Zuker,
President & CEO,
Pucara Resources

of the government's commitment, Cauti 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 MEM is planning to review more adjustments to specific legislation to see how the permitting processes can be expedited.

Peru's mining associations are also aware of the need to create a more favorable climate for exploration to increase the country's competitiveness, something that should become increasingly urgent in the wake of the COVID-19 pandemic. "Due to the importance of fostering exploration, it is currently under discussion to move the ILO 169 public consultation opportunity from the exploration stage to the feasibility mining project development stage, as is the case in several other mining countries with whom we compete," said Manuel Fumagalli, president of National Society of Mining, Petroleum and Energy (SNMPE).

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 Légaré, head of South America for the TSX and TSXV, who outlined 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 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.

One such CPC is Magnitude Mining, which entered into an arrangement agreement for a qualifying transaction with gold-focused junior Pucara Resources in March 2020. Since they were already trading on the TSX-V, an RTO was the most efficient and cost-effective way for Pucara to go public, according to Steve Zuker, who will remain president and CEO of the new entity of Pucara, which intends to go public after its drill permits have been granted. "We will focus our exploration efforts on high-sulphidation epithermal gold deposits, as this is our expertise and there are only a handful of companies in Peru focused on grassroots exploration," explained Zuker, concluding: "In a challenging metals market, gold-focused companies should trade at a premium."

The importance of maintaining a healthy junior community has also been elevated by a lack of exploration by producers in recent years. "In the past 5 years alone we have noticed a substantial turnover in the exploration teams for most of the major mining companies exploring in Peru," observed Richard Osmond, president of prospect generator GlobeTrotters Resource Group, who remarked that this turnover makes it difficult for the majors to explore as effectively as junior teams which have been focused on project generation for more than a decade.

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, according to John Black, Regulus' CEO. Black provided an update on the company's phase II drill program, mentioning that the focus of the program has been to extend the mineralization, mostly to the north of the project. He also noted that the 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 C\$460 million in 2010, and Black believes they have the same scale of project or better with AntaKori. "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.

Another of the Canadian juniors active in Peru, Chakana Copper, used the investment received from Gold Fields in May 2019 to start 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. 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% of the value 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."

A new copper-focused junior entered the Peruvian market on February 25th 2020, as Carube Copper Corp (Carube) finalized the share-for-share acquisition of Latin America Resource Group (LARG) and its flagship Jasperoide copper-gold project. Jeff Ackert, Carube's vice president of business development, highlighted Jasperoide's premium location in the Andahuaylas-Yauri belt, which hosts several large producing copper-gold-molybdenum deposits including Las Bambas (MMG), Antapaccay (Glencore) and Constancia (Hudbay). Regarding the focus of the Ontario-

"As we are going to be producing revenue, we now have the ability to tap into non-dilutive capital sources such as streaming and debt."



-Steven Zadka,
Executive Chairman,
Cerro de Pasco Resources

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based junior which also has projects in Jamaica, British Columbia and Nova Scotia, Ackert affirmed that the majority of exploration dollars will be directed towards Jasperoide in 2020: “The ability of exploration companies to make discoveries and put projects into production in Peru is testament to how the government and mining community has put the country on the map as a leading jurisdiction, especially for 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.

With gold breaking the US\$1,700 barrier in April 2020, the few gold-focused juniors active in Peru are in an enviable position compared to their counterparts exploring for base metals during a bear market. According to Yuri Valdivieso, geologist for Palamina: “If you look at Peru, there are no new gold projects coming up, and at the global scale these projects are very scarce. This scarcity, coupled with the uncertainty surrounding the world economy, will continue to push the gold price upwards.”



“Through three phases we ultimately ramp up to 85,000 tonnes per year (mt/y) of lithium chemical, with an average of 63,000 mt/y and a 33 year mine life. At 85,000 mt/y, that would put Falchani as today's single largest lithium chemical project in the world.”

**-Alex Holmes,
CEO,
Plateau Energy Metals**



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 2021. Kuya's all-in costs to acquire, expand and restart the mine will be US\$18 million to US\$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 gold 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.

LITHIUM AND URANIUM

In February 2020, Plateau Energy Metals announced a positive PEA for its Falchani deposit in Puno. The PEA indicates a scalable, long mine life battery-grade lithium chemical project which Benchmark Mineral Intelligence (BMI) rates in the low second quartile of operating costs. Alex Holmes, CEO of Plateau Energy Metals, explained how a phased expansion approach will give Falchani the scalability to be able to adapt to the market: “Through three phases we ultimately ramp up to 85,000 tonnes per year (mt/y) of lithium chemical, with an average of 63,000 mt/y and a 33 year mine life,” he said, observing that 85,000 mt/y would put Falchani as today's single largest lithium chemical project in the world. As an example, SQM in 2019 produced approximately 70,000 mt/y of lithium chemicals,” he added.

Pending results of the continuing additional test work Plateau is performing, Holmes discussed some of the company's aims for the coming 12 months: “We would like to update the resource to include the by-products hosted at Falchani, and advance our MOU with the major fertilizer trader, marketer and producer, Ameropa AG, for the fertilizer side of the business.”

Before the Falchani lithium discovery changed the company's focus, Plateau Energy Metals (previously Plateau Uranium) had worked on the consolidation of extensive uranium resources in the Macusani district in Puno, south-eastern Peru. While the uranium industry has been in the doldrums since the 2011 Fukushima disaster in Japan, the radioactive metal used in nuclear fuel surged 31% between January and April 2020, making it the world's best-performing major commodity. Peru is a founding member of the International Atomic Agency, and the government has passed draft regulations regarding the safe handling of uranium from the site to the port, and the port to the enrichment facilities.

ZINC

The dire performance of zinc in 2020 has left some producers operating at a loss, and zinc-focused juniors looking to raise money at the risk of severe dilution as share prices have fallen in tandem with a demand decimated by COVID-19. However, for well-financed juniors with the capacity to weather the current bear market while they increase resources and reserves, the hope is that when their projects have advanced to development stage, the supply and demand dynamics will have swung back in their favor.

Tinka Resources announced a C\$18.5 million deal bringing Buenaventura on board as a strategic investor at the beginning of the year, the second biggest financing in the Canadian capital markets in January, and biggest for a base metals junior (figures from Oreninc). Graham Carman, Tinka's president and CEO, explained how the Ayawilca project will come online in about four years, and the company is fully cashed up (C\$21 million in the bank and no debt as of April 2020) and permitted for exploration work through to 2021. Acknowledging that work at Ayawilca in 2020 has been impacted due to Coronavirus, Carman gave an update on the current project timeline: “We expect to have an expanded and improved zinc resource late 2020, and then be able to commence a PFS during 2021-2022. As

“We expect to have an expanded and improved zinc resource late 2020, and then be able to commence a PFS during 2021-2022. As long as permitting can be completed on time, first production at Ayawilca could be in 2024... Ayawilca should be the next large zinc development project in the pipeline in Latin America.”

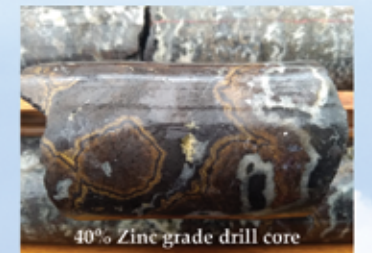
**-Graham Carman,
President &
CEO,
Tinka Resources**



long as permitting can be completed on time, first production at Ayawilca could be in 2024.”

Another junior with a path to produce zinc concentrates, as well as lead, silver and gold, is Cerro de Pasco Resources (CDPR), which in November 2019 announced it would acquire Volcan Compañía Minera's Oxidos de Pasco asset for US\$30 million. On March 17th both parties agreed to extend the closure date of the acquisition until June 27th, in light of the COVID-19 situation. Steven Zadka, CDPR's executive chairman, suggested that CDPR is trading on different territory to most juniors as it is acquiring a producing company: “As we are going to be producing revenue, we now have the ability to tap into non-dilutive capital sources such as streaming and debt,” he said, noting that there is also a lot of equity upside for investors considering the 140 million mt of material inside the mine in addition to exploration potential. “When an equity IRR is supplemented against a non-dilutive capital, you are looking at a really high return on investment,” stated Zadka.

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Tinka is fully funded and fully permitted to commence its 2020 resource expansion and infill drilling program, as soon as corona virus travel restrictions are removed.

Tinka is targeting a significant resource expansion and PEA optimization for Ayawilca in 2020, leading to a PFS in 2021-2022.



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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. In February 2020, ERM acquired Critical Resource Strategy & Analysis – a specialist sustainability advisory company. 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.

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, 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," 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.

Innovation has also been a growth driver for Wood, since the GBP 2.2 billion merger of Wood Group and Amec Foster Wheeler, according to Franco Pedraz, operations manager for mining & minerals at Wood's Peruvian office. "We believe that if a company and its operations are digitized, the initial capex investment will decrease the opex significantly. I think as soon as people have enough examples of projects where technology impacted the opex savings, they will place a bigger emphasis on the implementation of innovation." On the subject of technology, Patrick Smith, managing director and CEO of AMC Consultants, commented that the ability to start a mine with new innovations is more feasible for those with larger budgets and large-scale, long-life mines, such as open-pit iron ore operations,

for example. "However, it is more common for companies to evaluate their projects on the basis of tried and tested technologies, and then after they have built the mine, they implement extra technologies to improve the operation," he explained.

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."

Multidisciplinary engineering company Anddes is headquartered in Lima and has 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 funding," 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, three years on from the Mariana tragedy in Brazil, disaster struck again, as the tailings dam at Vale's Brumadinho mine in Minas Gerais burst, killing 293 people and causing extensive environmental damage in the region. At Exposibram 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 a similar failure in 2015?

"We believe that if a company and its operations are digitized, the initial capex investment will decrease the opex significantly. As soon as people have enough examples of projects where technology impacted the opex savings, they will place a bigger emphasis on the implementation of innovation."

**-Franco Pedraz,
Operations Manager –
Mining & Minerals,
Wood**



A lack of high-level expertise may be one factor. "There are a huge number of tailings dams in the world. Klobn 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



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Enrique Sattler,
CEO,
Robocon



Eduardo Cossio Chirinos,
CEO,
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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 Everaldo Abegg, country manager – separation for Andritz Peru, who mentioned that Dams

are still the dominant medium but there is a lot of interest in dry discharge. "Companies are conscious of the issue of becoming dependent or liable to a tailings pond and they are seeking preventive technologies," said Abegg, observing that most new projects are mindful of how to incorporate technologies to insure safe dry stacking, increased product recovery and lower environmental risks. "Tailings de-watering is, without a doubt, becoming the preferred management strategy for discharges," he added.

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 years to come, with the likes of Yanacocha underground, Corocochuayco and Antamina all expected to transition underground in the new decade. In 2017, a joint venture agreement was signed between underground Australian contractor Byrnegut and local Peruvian firm San Martin with the impending transition to large-scale underground mines in mind. The move to the type of underground mining Byrnegut specializes in – large open stopes, sub level caves and block caves using bulk mining methods with large tonnage – has yet to gather pace in Peru, as projects such as Yanacocha underground have suffered delays due to metallurgical issues moving from an oxide ore body to a sulphide ore body. However, Byrnegut remains committed to South America in the long run, according to managing director Greg Jackson, as the company sees the move to large-scale underground mining as inevitable. Jackson explained how Byrnegut works directly in the R&D phase with OEM's, providing feedback on how equipment can be developed to suit the specifics of different mines. "As Peru does not yet have experience in large-scale underground operations, when the transition happens Byrnegut will be well placed to suggest the most suitable mining methods and technology to implement," he said.

Many projects also begin as underground operations with no open cut component at all, such as Nexa Resources' Cerro Lindo polymetallic mine in Chinchipe, 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."

"Byrnegut works directly in the R&D phase with OEMs, providing feedback on how equipment can be developed to suit the specifics of different mines... As Peru does not yet have experience in large-scale underground operations, when the transition happens Byrnegut will be well placed to suggest the most suitable mining methods and technology to implement."

-Greg Jackson,
Managing Director,
Byrnegut



Another of the major players in Peru's underground mining value chain is AESA, which achieved record sales in 2019 due to a combination of new projects as well as ramp ups on existing projects, according to Gianflavio Carozzi, CEO. Detailing how a sharpened focus on safety has been key to AESA's growth, Carozzi explained how 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



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material are going to be well understood,” he said, 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.

TECHNOLOGICAL ADVANCEMENTS

Extracting ore at depth can be a complicated, costly and dangerous business, and a worrying rise in the number of fatalities at mine sites in 2019 (40 deaths, versus 27 deaths in 2018) has heightened the need to remove workers from areas of risk. One of the ways this risk is being mitigated is through technology, and in particular the mechanization of services.

From the side of the contractor, Diego Morales stated that Mas Errázuriz now only works with semi-automatic equipment.

Furthermore, the company is testing the use of remote control electric equipment in Chile.

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. Furthermore, Robocon has been 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 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 Raise Boring and Robocon’s sister company Tecnomecánica, Robocon can ensure the tunnel has the correct proportions so the shotcrete is 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

Times of great change breed innovation, as health and safety take on critical importance

The term disruption is often linked to innovation. In this sense, disruption can be seen as something positive, replacing the old with the new, such as the transition from pick-axes to mechanics. However, the definition of disruption – disturbance or problems which interrupt an event, activity, or process – has negative connotations. In this sense, the COVID-19 pandemic has caused a level of disruption not seen since the second World War. To illustrate the level of disruption, by late April 2020, toilet paper was more valuable than oil. In such a context, companies are forced to innovate. As lockdown orders forced employees to work from home, in-person meetings were replaced by video calls. For the original equipment manufacturers (OEMs) operating heavy equipment at mine sites, quarantine measures forced an abrupt scaling down of activity.

“The measures taken by the authorities have impacted the supply of components, transportation, and Epiroc’s operations in general” explained Ángel Tobar, Epiroc’s general manager for the Andean region, who added that most of the company’s customers in Peru have stopped or heavily reduced their operations. “At this time [April 15th 2020], our distribution center is operational, with some limitations, and our main priority is to safeguard the availability and the supply of spare parts, rock drilling tools and other essential products in order to support our customers’ operations in the best possible way,” he stated.

From a safety standpoint, the mining industry will need to implement new technology to mitigate the risk of COVID-19 spreading when operations ramp up post-lockdown. Which measures and processes could be implemented? “COVID-19 is accelerating the adoption of certain technology-based solutions in order to be more efficient and more secure,” said Marcos Wieland, general manager of digital transformation company Sitech, part of the Ferrycorp group that includes Caterpillar distributor Ferreyros. “For instance, the vision of having a paperless mine through digitalization is becoming a must,” he affirmed, as the use of digital tablets negates the need for workers to pass paper to each other, helping to minimize person-to-person contact.

OEMS LEADING TECHNOLOGICAL ADVANCEMENTS

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 to new technologies, Tobar commented that at first it was multinational operators who started to adopt these changes, but nowadays the local operators are realizing that these trends are irreversible and do not want to be left behind in the effort to maintain productivity rates at competitive

levels. “Although not all companies evolve at the same speed, we are convinced that Peru will be, in just a few years, at par with the other large mining countries in terms of technology development,” he said. Observing that technological advances are being implemented faster than was initially expected, Tobar continued: “These smarter tools will allow us to operate with the highest environmental standards, increasing safety, productivity, wealth and job opportunities – in other words, our contribution to the mining industry is to work towards more sustainable mining practices.”

For Jörgen Sjöstedt, VP Peru and Region North at Volvo, innovation has helped the truck manufacturer guarantee uptime, the key client consideration for 2020. “Being able to assure availability to clients starts from the design phase,” explained Sjöstedt. “From a technological standpoint, we have implemented connectivity solutions in our equipment and vehicles to be able to monitor uptime and prevent breakdowns,” he said, pointing to automation as a way in which Volvo is improving productivity, safety and availability.

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The need to maximize uptime was also reinforced by Oscar Jaern, CEO at Scania Peru, who mentioned how the configuration of a product is important when it comes to availability. “Scania’s Heavy Tipper has a reinforced high line, suspension, breaks and various components which are specifically dimensioned for mining environments,” he said, commenting that details of a customer’s operations can make a huge difference in terms of component durability, and therefore Scania works closely with

clients to design suitable equipment. “Preventative maintenance is also very important to analyze data which helps avoid breakdowns and reduce downtime,” he added.

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.



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“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 in markets such as Australia or Canada. 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 proximity detection, collision avoidance sensors, and fatigue monitoring tools will be easier to introduce.

Considering the financial burden placed on the industry by COVID-19, will investment in innovation become an afterthought? “There will be very tough times to come in terms of commodity prices: this will impact the mining budgets, however, we believe it is not the time to eliminate or turn down technology projects,” reflected Wieland, concluding: “On the contrary, we believe it is the opportunity to strengthen the digital transformation agenda: efficiency is required more than ever and technology can help.”

When envisaging the digital mine, the move to cloud based solutions seems inevitable, but the path and timeline to achieve this depends on variables such as the size of the company, specifics of each operation, and market conditions. The disruption caused by COVID-19 has shown the industry the benefits of autonomous operations that can be operated remotely. “The final target for companies is to have autonomous operations, and ABB has a clear road map for that,” stated Wilson Monteiro, country manager for Peru at ABB, observing that many clients are willing to adopt digitalization, but do not know how or where to start. “The first of the steps necessary to define this roadmap is a customer value workshop where we help identify the key points related to the specifics of a mine. This is followed by a digital maturity assessment,” he explained, noting that factors such as life of mine can greatly impact the digital strategy that should be put into place.

“The final target for companies is to have autonomous operations, and ABB has a clear road map for that. The first of the steps necessary to define this roadmap is a customer value workshop where we help identify the key points related to the specifics of a mine. This is followed by a digital maturity assessment.”



-Wilson Monteiro,
Country Manager – Peru,
ABB

Juan Parra, general manager of Emerson Automation Solutions’ Peru branch, has noticed an encouraging change in business mentality in recent years: “The industry is increasingly interested in value added technology and especially in the opportunities for digital transformation,” observed Parra, continuing: “Instead of integrating technology at an operational level, Peruvian mining is ensuring optimization is integrated from the project planning stage,” he said, suggesting that operational efficiencies and better uptime are replacing cost as the main consideration.

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

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**-Guido Perez,
Latam and
US Regional
Director,
Micromine**



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 becoming 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.

Competing against the global dominance of international OEMs 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.”

Austin (previously Austin Engineering) supplies equipment to large global mining

clients, mining contractors and OEMs. In 2019, the company was recognized by the Australian Financial Review (AFR) as one of Australia and New Zealand’s Most Innovative Companies of the year for its two-piece excavator bucket. One of the pillars of the company’s philosophy which led to this recognition has been a focus on customized equipment, according to Luis Flores, general manager of Austin Peru. Elaborating on the benefits of Austin’s KUTIC design, he said: “Our truck body Austin KUTIC design is 10-15% lighter and still includes the strength required to achieve the excellent performance of any OEM truck in the open pit mining industry. The KUTIC design also maximizes payload.” Flores added that KUTIC will soon be introduced to the Peruvian market.

In the underground mining space, the range of equipment, infrastructure and software necessary to operate can drive up both capex and opex. In a post-COVID-19 context, when metals prices are depressed and budgets have been slashed, the industry will look for solutions that can lower costs as well as improving operational performance. With that in mind, Guido Perez, Latam and US regional director at Micromine, spoke of the latest technology the mining software company is currently developing: “We are working on innovations that combine machine vision and deep neural networks, similar to technology seen at airports where a camera recognizes your face through signals painted on the walls. This negates the need for extensive and costly underground network infrastructure.”

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 after-sales. 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 after-sales services to the market, but in recent times we have experienced a very high demand for condition monitoring,” noted Rothgiesser.

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 be sent onsite even before the client finds out that there is a problem.

One of the industry leaders in compressor technology, Atlas Copco, offers a remote monitoring solution called Smartlink, a device that sends data to a central server. Vicente Trenado, general manager of Atlas Copco Andean Region, described how the data is displayed in a website which is accessible by the end-user, so they can access real-time information on their computer or cell phone from any location. “This can be for any equipment, and gives maintenance teams the relevant readings where they can see working conditions, temperature, and pressure-drops, among other things. From Atlas Copco’s side, we can do data-mining; in other words we can contact the customers proactively when we see there is an irregularity or a risk,” he said, adding that Atlas Copco uses this data-mining to research and develop the next generation of products it will produce.



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Mining Services

When operations ramp up, will producers prioritize price or quality?

Just as the downturn seemed to be in the mining industry's rear-view mirror and the focus had shifted from cost-cutting exercises to increasing production efficiency, COVID-19 struck. For those not fortunate enough to be considered essential services, how will the post-pandemic climate impact their business? Will cash-strapped clients look for the lowest prices, or will mining companies look to compensate for lost production by investing in new technologies that boost metal output?

"Right now I do not think it is the right moment to incorporate disruptive changes that would involve big job losses," remarked Victor Gobitz, president of the Peruvian Institute of Mining Engineers (IIMP) and CEO of Buenaventura, commenting that the adoption of new technology will have to happen step by step. "In this moment, people is our first priority; the second priority is keeping the essential care and maintenance on our sites; the third priority will be to restart mining operations; and just when we have a stable operation, we will look at new technology and efficiency measures," he added.

For Jorge Granda, general manager of AK Drilling, technology should be used to improve machine efficiency, but not to remove human operators, underlining their importance for matters of safety and quality: "Drilling is an artisanal practice where the human factor goes hand in hand, and therefore we do not believe that 100% automation will be achieved or is recommended," he said.

On the topic of how to price services, Granda mentioned it would be ambitious to claim that drilling clients are all willing to pay for quality, but the importance is starting to be understood after some of the majors suffered poor results attributed to cheap drilling. "Our challenge for 2020 is to provide a sophisticated product with frontline technology and highly-trained personnel at low prices," he said, mentioning the

new technologies AK Drilling is developing in liaison with IDS, such as horizontal drilling, deep-pit drilling and automated diamond drilling.

"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 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 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.

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 does one differentiate oneself from the competition? One way is to buy the competition. On February 18th 2020, Orica announced it would acquire Exsa, Peru's largest manufacturer and distributor of industrial explosives, which Orica's managing director and CEO Alberto Calderon stated would immediately establish Orica as the number one player in Peru.

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 as evidence of Orica's commitment to offer an 'end-to-end' approach.

CHEMICALS

In 2019, Melbourne based chemical distributor IXOM began a transformation strategy to focus on its strongest sectors and segments, according to César Castillo, general manager of IXOM Peru. In Peru, this process involved expansion of some of IXOM's business lines, such as mining, which represents 50% of the company's business activity (a figure the company envisions to grow to around 70% moving forward). Discussing how IXOM involves its mining clients in the R&D process when developing its products, Castillo explained that the company tests product performance in terms of a site's particular geology. "Minerals vary greatly, not only among projects but often within the same operation," he said, noting that efficiency improvement rather than price has been the most important metric for clients.

Regarding the type of mining clients IXOM works with, Castillo suggested the company was looking to expand its scope: "IXOM's mining business partnerships are currently with producers directly, but we want to increase our outreach to EPC companies and contractors too. Partnering with EPC companies brings advantages such as the integration of technology to mine design directly."

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.

One of the larger players in this sector is Confipetrol, which 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.

Having worked with some of the largest players in Peru's mining industry, including Nexa Resources, Yanacocha, Minsur and Barrick Gold, Miranda suggested 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: "That is the best way to focus on finding reserves, exploring and processing them," he concluded.



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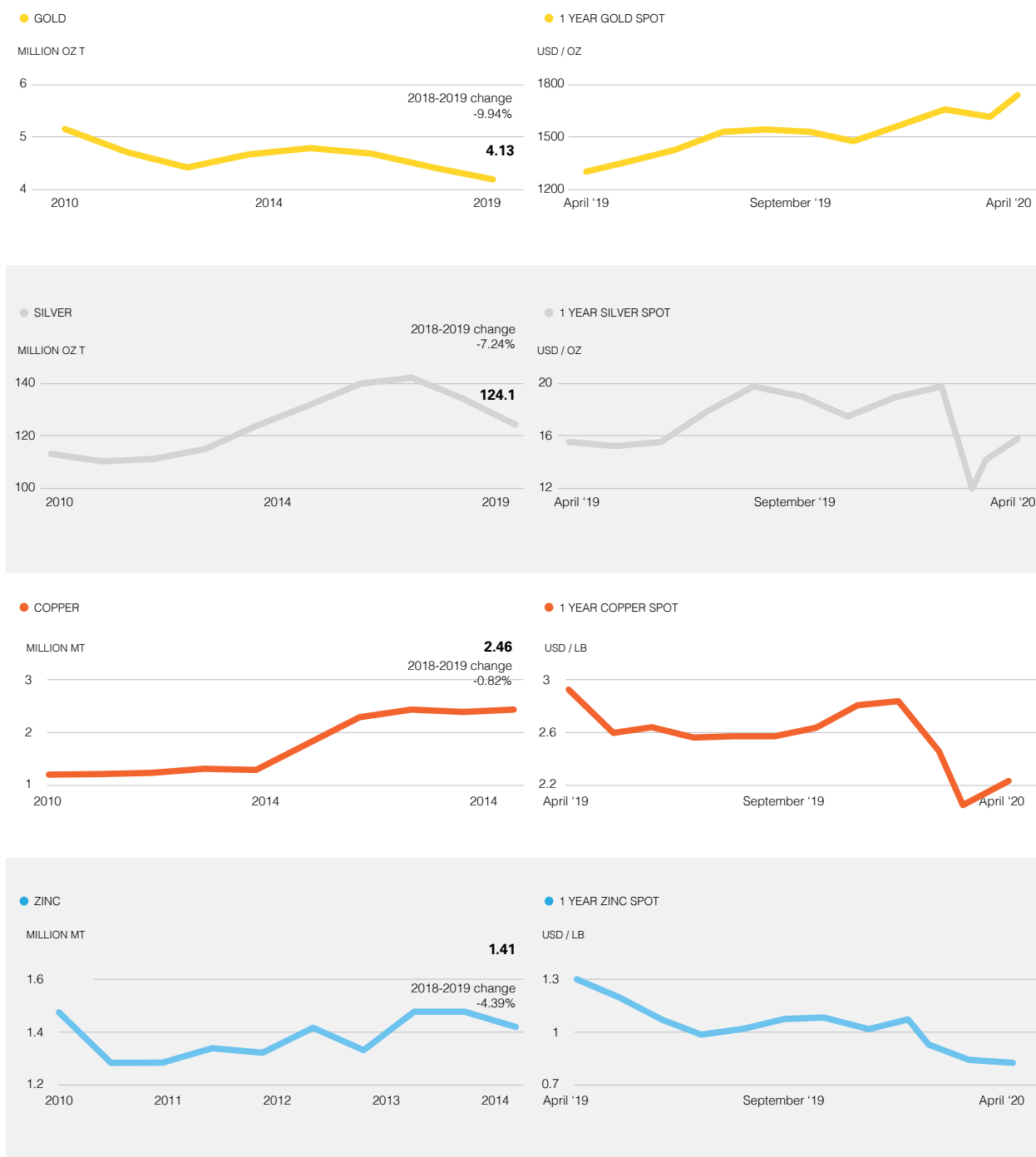
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