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PERU MINING 2023

Pre-Release Edition II





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Peru's Economic Engine

The rocky road of politics in Peru

After 16 months in office and having survived two impeachment efforts in eight months, the former socialist Peruvian President, Pedro Castillo, was impeached and arrested on December 7th 2022, after attempting to illegally dissolve Congress so as to rule by decree.

During his speech before his arrest, the then-president stated that “a new Congress with constituent powers to draw up a new constitution” would be convened within no more than nine months. However, Congress, controlled by parties opposed to Castillo, called an emergency session, and passed Castillo's third impeachment and removal with 101 votes in favor, and only six votes against and 10 abstentions. As a result, Vice-President Dina Boluarte became the first female president in Peru's history. She also became the sixth president in the last six years, a clear sign of Peruvian politics' volatility.

Castillo's presidency could be considered as part of the Latin American shift toward leftist governments; a fact that has concerned the mining industry and investors. In fact, the governments of Mexico, Colombia, Argentina, and Bolivia issued a joint communiqué on December 12th, expressing their deep concerns over the events taking place in the Andean country.

Boluarte's rise to power was not welcomed by specific segments of Peruvian society, especially amongst rural communities. Outraged by the events of the executive branch, protestors took to the streets across the country demanding Castillo's release, Boluarte's departure, the closure of congress, new early elections, and a Constituent Assembly. However, these demands seem unlikely to be fulfilled as clashes continue.

Even though elections were initially scheduled for 2026, after weeks of nationwide protests, Boluarte urged Congress to move elections forward to April 2024. Lawmakers agreed, but Congress continues to be divided regarding moving the elections even earlier, to late 2023.

As political turmoil hinders mineral production and dampens investors' sentiment, Boluarte keeps pushing to move forward with the elections. Indeed, at the beginning of February, she proposed a new bill to bring elections to October 2023, but a congressional commission shelved it before it reached debate.

More recently, in March 2023, a bill proposing the advancement of elections to December 2023 was once again rejected by Congress, and some members of the Peruvian unicameral legislative body conditioned their vote on the inclusion of a referendum to create a Constituent Assembly. As for Boluarte, 27 congressmen from different parties have advocated for the current president's impeachment due to the political violence of the State against protesters.

According to Amnesty International, at least 67 people have died since widespread protests began in December, including at least 40 deaths from state repression. Several international human rights organizations, including the United Nations High

Commission for Human Rights, have urged the Peruvian Government to promote an environment conducive to dialogue amid growing allegations of excessive use of force by security forces.

The future of the political landscape in Peru remains uncertain in the upcoming months. Polarization on the streets and high fragmentation in the Congress and the party system have made it challenging to address the ongoing political crisis through formal institutional channels, leaving many wondering about the road ahead and the potential impact that will have on the mining industry.

Social conflicts: an issue of understanding

Protests and social conflicts are nothing new to the Peruvian mining industry. Conflicts with local communities have been jeopardizing mining operations for a long time, but Castillo's detention triggered an uptick that halted the production from some mining units.

Recent data from the Peruvian Office of the Ombudsman for the Prevention of Social Conflicts and Governance has shed light

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on the country's current state of social conflict. As of February 2023, there were 218 social conflicts, with regions such as Loreto, Cusco, Apurímac, Áncash, and Puno reporting the highest incidence. Social conflict remains a significant challenge for Peru, and measures must be taken to address the underlying issues that fuel these conflicts and imperil mining production.

Mines that share the Southern Mining Corridor (CMS, from Corredor Minero del Sur), such as Las Bambas (MMG), Constancia (Hudbay), and Antapaccay (Glencore), have been experiencing blockages affecting their mineral production over the last years. It was not until Anglo American's Quellaveco was set into production in September 2022 that monthly copper production overcame pre-pandemic levels, but the current situation is having detrimental effects on production.

For instance, China-backed MMG's Las Bambas in Apurímac is one example of the deep-rooted problem. In 2022, Las Bambas was paralyzed for more than 50 days, and on January 30th 2023, the company issued a press release stating that the unit was put on maintenance due to community unrest. The disruptions to inbound and outbound transportation and the shortage of key inputs have forced it to progressively slow down its operation, which accounts for around 2% of copper worldwide. It was not until March 13th that the company finally announced the removal of the roadblocks in the Velille district that had disrupted logistical transportation and the resumption of operations at full capacity.

Glencore's Antapaccay, an operation that represented 6.2% of national copper production in 2022, is another example where political unrest is hindering mineral production. In January 2023, the company released a statement declaring that it had halted operations after an attack that set on fire a worker's housing area. Before this attack, several protesters had vandalized Glencore's water plant and Antapaccay was already operating with only 38% of the labor force. The mine resumed operations after 11 days.

Minsur's San Rafael, the main producer of tin in South America, has been affected as well. The tin producer has been slowing down its operations and tin production since the beginning of 2023. However, in February,

"One of Peru's main challenges is maintaining proper public resource management so Peruvians can understand the direct link between mining investment and national welfare."

Víctor Gobitz,
President, SNMPE



local authorities, along with representatives of the mining company, announced that the local population of Antauta have finally reached a settlement agreement with Minsur, which resumed operations.

Even though Peruvian GDP rebounded after 2020, the current turmoil might jeopardize GDP growth because of the impact of protest in the south of Peru, an area that accounts for 18% of the GDP. Moreover, according to a BBVA research publication of February 2023 about the Peruvian Mining Sector, the social unrest in 2022 caused a 3.2% contraction in mining GDP in 2022, equivalent to US\$760 million.

As protests escalate, one can only wonder what is compounding the gap between the mining industry and local communities. If we look at the annual evolution of tax revenue from the mining industry, we can appreciate that taxes have been on the rise since 2020. Besides, 2022 showed a tax revenue of S/15.8 billion (around US\$3.89 billion), a positive variation of 12.3% compared to 2021, marking the second consecutive year that revenue from mining has reached record levels.

Additionally, according to the Ministry of Energy and Mines, in 2022, resource transfers to regions from mining amounted to S/10.94 billion (about US\$2.91 billion), which makes the mining industry an important source of funding for subnational

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Santiago de Surco - Lima 15023
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governments. Marcial García, partner at EY, also highlighted the negative impact of blockages of mining operations, especially considering that copper represents 30% of the total exports of the country and 50% of the total minerals exported, and that the recent temporary shutdowns and blockades affected some of the most critical copper operations and the CMS, the main route by which copper is transported from Southern Peru to shipping ports on the coast. "According to a recent IMF study, at the request of the Ministry of Economy and Finance, the current regime is competitive mainly because of the use of specific profit-based levies," asserted García.

It seems, however, that large segments of the society do not see any link between mining investment and Peru's well-being. Mining's contribution to Peru in terms of GDP and other macro-economic figures are facts that not all social segments can grasp. In this context, Víctor Gobitz, president of the National Society of Mining, Petroleum, and Energy (SNMPE), stated: "One of Peru's main challenges is maintaining proper public resource management so Peruvians can understand the direct link between mining investment and national welfare."

In this sense, Fernando Pickmann, partner in charge of mining at Dentons, considers that, to prevent further social conflicts, mining companies must deepen their relations with local actors affected by mining activities. "To reduce social conflicts and achieve strategic growth, companies must go beyond paying taxes and complying with social standards; they must understand the circumstances and visions of local stakeholders, generating social investment that provides them with sustainability and a relationship of good friendship with the communities," he concluded.

Despite social conflicts, the mining industry continues to work with local communities to bridge this gap for a better future where mining and society coexist harmoniously. Mining investors who have a long-term vision of the country's geological potential do not seem particularly deterred by the current turmoil. The recent Rio Tinto's investment of C\$20.5 million (US\$15 million) in Regulus Resources' AntaKori copper-gold project in Cajamarca is proof of this.

Opportunities for growth

Despite the challenging situation, there are multiple reasons to be bullish on Peru. The Ministry of Foreign Affairs and the multinational firm EY published a report in February 2022 estimating that only 0.28% of the country is being explored and only 1.07% of its territory is under exploitation. This provides plenty of space for mining companies to develop new projects. Moreover, due to the decarbonization goals set by the Paris Agreement, the world needs more minerals than ever, especially copper, to transition into an electrified future. Analysts state that the demand for copper will grow to 50 million tons per year (t/y) by 2035, leading to a potential supply gap of around 9.9 million t/y. Peru, with its copper endowment, has a pivotal role to play.

According to the 2023 Portfolio of Mining Investment Projects, published in January 2023 by the Peruvian Ministry of Energy and Mines (MINEM), Peru has a pipeline of 47 projects with an overall investment value of US\$53.7 billion, showing an increase of 2% compared to the previous edition published in 2021.

"Maximizing the mining sector's tax burden could harm productivity, as for every USD of company profit, almost half of it is already retained in Peru through levies like taxes and royalties."



Marcial García,
Partner,
EY

"Peru is an underexplored country due to its rugged topography, social conflicts, and lack of adequate communication and access to infrastructure. These factors span a horizon for exploration activities."

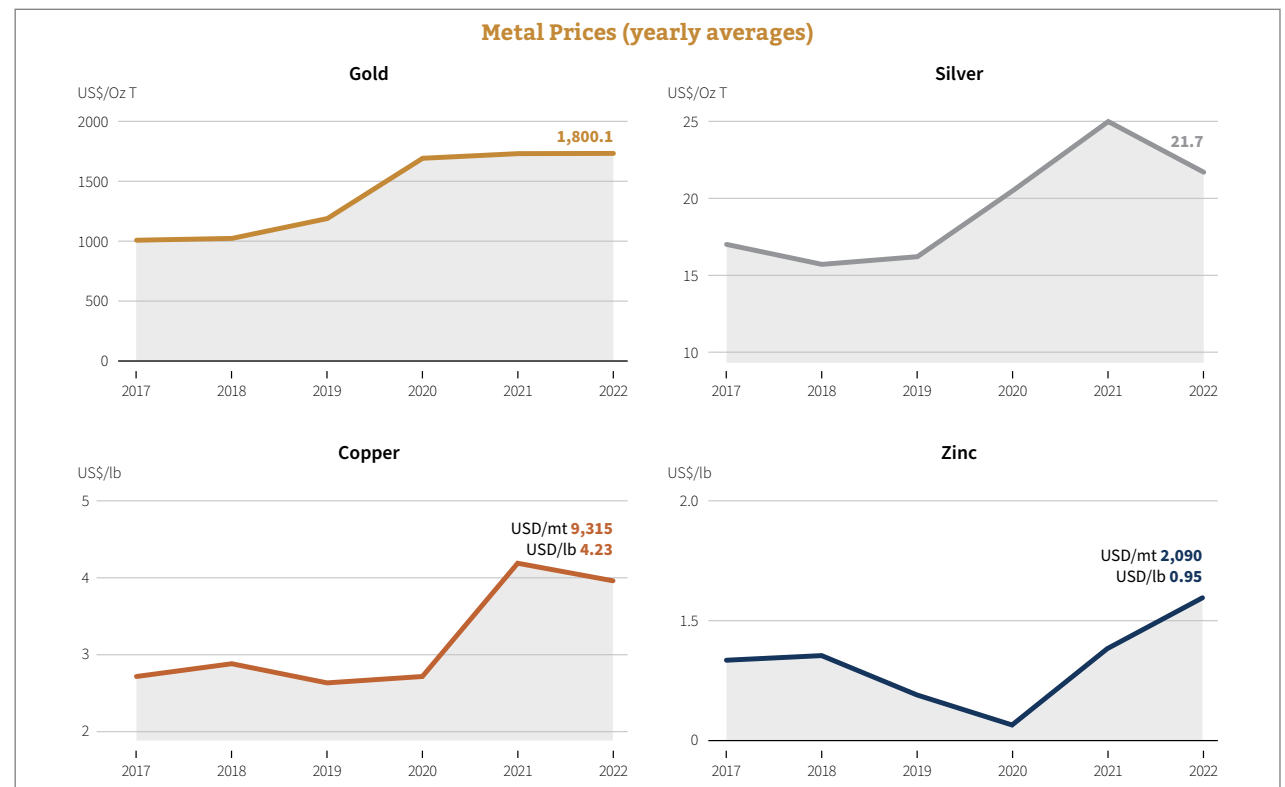


Fernando Pickmann,
Partner in charge of
Mining, Dentons

The main developments in the portfolio are the addition of eight new projects, three were withdrawn (American Lithium's Falchani and Macusani and former Zincore Metals' AZOD project), and one was brought online: Quellaveco.

On the one hand, by 2023, it is expected that four projects will start construction, with a combined investment of US\$2.95 billion: Nexa's Magjstral, Bear Creek's Corani, Chungar's Romina, and Antamina's Reposición Antamina. The last two are being incorporated into the pipeline for the first time. On the other hand, by 2024, the construction of Newmont's US\$2.5 billion Yanacocha Sulfides project in Cajamarca is expected, and Teck's Zafranal project in Arequipa, which could amount to US\$2 billion as the company revises upwards the value of the project. It is noteworthy that Newmont's mega-project Yanacocha Sulfuros was expected to start construction in 2022 but was delayed due to rising costs and prolonged supply chain disruptions.

After the construction of Anglo American's Quellaveco project and its transition toward production, the entire Peruvian mining value chain relies on projects in the investment pipeline to begin construction and start ramping up operations. Provided the political climate stabilizes a bit, positive announcements should be made over the next couple of years. However, stakeholders wonder how long it will take to establish a fruitful relationship between local communities and the mining industry. For certain metals, such as copper, that represent most of Peru's production, the moment is now, while the trend towards an electrified future is gaining momentum. ■



Sources: Kitco, LME, GBR

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COLLABORATING MEDIA: MINERIA, GBR, ENERGINAS, MinerAndina, MINERIA & ENERGIA, ProActivo, American Mining Association, MINERA

OFFICIAL PUBLICATION: MINERIA

INTERNATIONAL: GBR

LOCAL: ENERGINAS, MinerAndina, MINERIA & ENERGIA

ORGANIZER: INSTITUTO DE INGENIEROS DE MINAS DEL PERÚ

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Mining Production

Metal prices on the rise



Image courtesy of Minera IRL

Peru is home to a remarkable mineral endowment and few mining jurisdictions boast a comparable level of resource wealth. As the second-largest producer of copper after Chile, and among the top four producers of molybdenum, silver, lead, zinc, and tin, the Andean country is a major player in the global mining industry. Mining is also the engine of economic growth and prosperity in the country: mining accounts for nearly 60% of the country's total exports and almost 10% of the GDP.

In hindsight, 2022 was a volatile year for the copper market as the industry faced a series of challenges: supply shortage in Europe, political unrest in Peru and Chile —the world's two largest copper producers—, limited production in China, and high inflation rates everywhere. In July 2022, copper prices dropped to US\$3.22/lb, the lowest since November 2020, as fear over a worldwide recession loomed.

The situation with precious metals was not much different. Silver remained below 2021's price levels. According to the London Bullion Market Association, silver prices averaged US\$21.73/oz in 2022, down from 2021's average price of US\$25.14/oz. On the other hand, 2022 saw a record annual average gold price of US\$1,800/oz, closing the year with a marginal gain despite the headwinds from raising global interest rates and the strong US dollar.

However, as we entered 2023, a series of events changed the trends that marked metal prices in 2022. On March 10th, the Bank of Silicon Valley (SVB) collapsed as the Federal Reserve increased interest rates to combat inflation. SVB's fall was a catalyst for other banks to shake. Thus, the US Signature Bank also ceased its operations, and then, the Saudi-backed Credit Suisse's shares crashed as much as 30%, followed by almost CHF 50 billion (US\$ 54.35 billion) lifeline from the Swiss Central Bank. While Credit Suisse is to be acquired by UBS, Europe's banking stocks also

tumbled on fears of a looming recession and another European banking crisis.

As a potential domino effect shook the foundations of the international financial system, investors moved their attention toward precious metals. Thus, gold's price climbed over US\$2,000/oz for the first time in a year. Other precious metals such as silver and platinum rallied along with gold.

While gold was on the rise, the opposite happened to copper prices. Although optimism surrounded copper as China lifted strict Covid-19 lockdowns, concerns about the banking sector choked the early-year enthusiasm. After a bull run where copper price reached US\$4.29/lb, on January 26th, copper dropped to US\$3.87/lb. Even though gold overshadowed copper's performance, analysts forecast that copper prices will keep rising. According to Trafigura, copper prices will surpass the US\$4.94/lb peak achieved in March 2022 and could even hit US\$5.44/lb (US\$12,000/t). Goldman Sachs also forecasts a near-term copper price around US\$4.76/lb and has an even more bullish outlook of US\$6.80/lb in the long term.

As the banking crisis makes analysts question if this will lead a global financial crisis, gold prices are rising while copper prices are surrounded by optimism. Thus, some mining producers in Peru anticipate that increasing prices will allow for better production and enable them to focus on organic growth.

Copper output

Copper enjoyed a steady production during 2022 for the second year in a row, almost equaling pre-pandemic levels (2.44 million t/y in 2022 vs. 2.45 million t/y in 2019). In 2022, like in 2021, the top three copper producers in Peru continued to be Antamina, Cerro Verde, and Southern Copper.

According to MINEM's figures, Antamina produced around 468,000 mt/y, an increase of 1.6% compared to the 460,650 mt/y produced in 2021. Cerro Verde, operated by Freeport-McMoRan, in Arequipa, presented a better performance in terms of year-on-year growth, yielding a production of 459,100 mt/y (+9.7%). Southern Copper came third with a production of around 342,000 mt/y, with a decrease of 14.2%, mainly due to the halt of operations at Cuajone and a temporary decline in ore grades.

Las Bambas, operated by MMG of China, remained the fourth largest copper producer with almost 255,000 mt/y, but like Southern Copper, also presented a decrease of 12.2% in its year-to-year production, also due to ongoing conflicts with local communities.

After major companies that have been producing for years, it is noteworthy to mention the first copper production from Anglo American's Quellaveco in Moquegua. The long-awaited mining unit started commercial production in September 2022, yielding 94,200 t.

On the other hand, copper prices have been rising in the last months. Several factors contributed to this, one of them being the gradual easing of China's "zero Covid" policy. After a price decrease in the first half of 2022, China's lifting Covid measures fueled optimism on the red metal, and it is expected that China's new policy will help the economy normalize and boost demand. Such prices have encouraged Peruvian copper producers to focus on organic growth by enhancing exploration activities and expanding operations around their existing producing mines.

Hudbay Minerals is an example of the organic growth taking place in Peru. By consolidating the production of its satellite deposit at Constanca, Pampacancha, Hudbay ramped up production to 86,000 t/d. Moreover, in 2022 Hudbay conducted an exploration campaign at its copper porphyry deposit Llaguen, located 90 km from Trujillo in northern Peru. The initial mineral resource estimate includes 271 million metric tons of indicated resources at 0.42% of copper equivalent, and this year Hudbay will focus on preliminary technical studies to add to the PEA.

According to Javier del Río, Hudbay Minerals' VP South America and US, at Constanca Hudbay was able to keep production

"We expect to enter into a second stage to ramp up the production of Condestable between 10,000 mt/d and 12,000 mt/d by 2024 or 2025."

Adolfo Vera, President and CEO, Southern Peaks Mining



up and reduce costs by innovating in equipment and using machine learning. However, he highlighted the essential support of a strong professional team: "These initiatives can only be profitable and favorable if we have a team of professionals who constantly think about how to optimize work and give us the stability to achieve our goals," del Río pointed out.

Amid social unrest, Javier del Río asserted the importance of the relationship with local communities. In 2022, 45% of Hudbay's labor force came from local communities and it also took the leaders of the Chumbivilcas community to Canada to show them how mining and local communities coexist. Through its relationship with the community of Uchucarcco, Hudbay obtained the agreements to advance the exploration permits for the Caballito and María Reyna deposits next to Constanca.

Also focusing on organic growth is Southern Peaks Mining (SPM). After expanding its operations capacity to 8,400 mt/d at Condestable, SPM concluded a feasibility study to pursue a second-stage expansion. It has also undertaken actions to modify its environmental impact assessment (EIA) to allow it to enter into a second stage to ramp up Condestable's production between 10,000 mt/d and 12,000 mt/d by 2024 or 2025. Also, regarding permitting, the company is considering changing

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"The medium-term plan is to convert El Brocal into a 100% copper mine, with production ranging from 60,000 to 70,000 mt/y of fine copper."

Leandro García,
CEO, Buenaventura



the tailings dam's location and turning it into a filtered dam to move forward with its Ariana project: "As this is an environmental improvement to the project, we should be able to do this by approving a Sustaining Technical Report (ITS). Once we have this permit, we will have eliminated the risk that our plaintiffs wrongly claim to exist," claimed Adolfo Vera, president and CEO of Southern Peaks Mining.

Despite a declining production in 2022, Óscar González Rocha, executive president of Southern Copper Corporation, explained that Southern Copper is working at Cuajone to expand throughput to 108,000 mt/d instead of 90,000 mt/d: "We expect to bring Cuajone to a production level similar to Toquepala, where we process 120,000 mt/d."

Southern Copper also owns Tía María, one of Peru's largest projects in the pipeline, which has been in limbo for years, but Óscar González Rocha showed optimism, stating that he hopes to bring it online in 2023: "We recently met with the main Peruvian authorities to continue with the progress of the Tía María project in the Arequipa region. The project has all the engineering ready, and we expect it to come out this year once the political problems in the country are solved."

Precious Metals

2022 was a challenging year for precious metals in Peru. According to the latest yearly MINEM figures, production of both gold and silver decreased, by 0.8% and 7.6%, respectively. Lower gold figures are mainly due to the sustainable decrease from Yanacocha, Retamas, and Hochschild's Ares. Minera Poderosa continues to be the largest gold producer, showing an increase of 1.6% in production and accounting for 9.7% of the overall gold output. The latest production figures from MINEM paint a less than ideal picture for gold and silver mining production in January. Both precious metals saw a decline in production levels compared to the corresponding period in the previous year. Specifically, gold production experienced a dip of 6.8%, while silver production suffered an even steeper decline of 19.9%.

Buenaventura, a company that was for many years Peru's leading company in precious metals, continues moving forward with its precious metal and copper assets, and accounts for 4.3% of Peru's total gold production, having increased its output by 10.2% in 2022. In San Gabriel, it has been working non-stop to bring the project online since it was granted the construction permit in March 2022.

Meanwhile, at Uchucchacua, Buenaventura has been reviewing the mine design to optimize production and reduce costs: "We plan to restart operations at Uchucchacua by the end of 2023," commented Leandro García, CEO of Buenaventura.

Buenaventura also has Yumpag amongst its portfolio of projects, where it hopes to get the unit ready to start operations as soon as the permits are granted. The company identified an estimated resource of nearly 200 million oz of silver, signifying that it could be a large project. Finally, regarding El Brocal, the leading underground copper mine, Buenaventura wants to ramp up production to 9,000 t/d in 2023: "The medium-term plan is to convert El Brocal into a 100% copper mine, with a production ranging from 60,000 to 70,000 mt/y of fine copper," added García.

On a smaller scale, local gold producer Minera IRL produced nearly 21,000 oz Au, in line with its target to produce more than 20,000 oz/y. Corihuarmi, the producing mine of the company, is moving to its fifteenth year of operation. Minera IRL is seeking ways to optimize operations and maintain production while reducing costs. The company conducted a drilling campaign between July and November 2022 that, according to Pedro Valdez, vice-president of investors relations of Minera IRL, was a success: "The results exposed gold grades above 1.2 g/t, which could have a positive impact as we were producing gold at an average grade of 0.21 g/t," he explained.

The Peruvian producer is expecting to incorporate these results into another NI 43-101 that it plans to develop in 2023 to extend Corihurami's life.

Minera IRL also owns a gold project, Ollachea, and has been focused on financing it. The company produced in 2021 a PEA which reduced the capex by almost 50% to US\$89 million. On the other hand, it increased the inferred resources to 0.6 million oz and indicated resources to 1.13 million oz. According to Diego Benavides, CEO of Minera IRL, in the current context of financial uncertainty, gold projects such as Ollachea yield the interest of investors: "High gold prices can

"Although our copper production is bigger in Mexico than in Peru, we expect Cuajone's expansion and the commencement of the other projects in the pipeline will allow us to produce more in Peru."

Óscar González Rocha, Executive President, Southern Copper Corporation



mean higher cash flows for mining companies, which translates into improvements in exploration and drilling grades to increase resources."

On the silver front, Silver X is a company that reached its first commercial production in January 2023 and, according to its CEO, José María García, it became an economically sustainable company: "Due to the production levels of the Nueva Recuperada district, we have been an economically sustainable company since the third quarter of 2022," he commented.

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"In Romina, our projected production yields between 30,000 to 40,000 tons of zinc and 1 million ounces of silver yearly for an initial 13-year period."



Carlos Francisco Fernández Navarro,
CEO, Volcan

In February 2023, the company announced a PEA to ramp up operations at Tangana, the flagship asset within Silver X's 100% owned Nueva Recuperada Silver district. The PEA upgraded the mineral resources to 3.6 million t in the measured and indicated categories, anticipating an annual production of 4.2 million oz of silver equivalent, and estimated a net present value of almost US\$200 million, and a capex of US\$60 million. "Given the favorable results of the PEA, we are proposing the construction of a new processing plant that will double the current plant's capacity. We are seeking to have a capacity of up to 1,500 t/d," added García.

The company also owns the Plata project, which shares similar characteristics with Tangana: "It is another vein system in central Peru, and, on our property, we have over 200 high-grade veins. At Plata, we plan rapid exploration, development and mine construction in a few years," added García.

When asked about the company's objectives for 2023, García answered that it will seek to continue increasing the resources and is working on an EIA permit to increase production and open a new mining unit: "We expect to grow exponentially and be a choice for the development and production of silver assets," he concluded.

Zinc

The Peruvian zinc segment has also seen a downturn in production in 2022, with a decrease of 10.7% compared to 2021 (1.37 million t in 2022 vs 1.53 million t in 2021). The top producers remained unchanged with Antamina leading the production, accounting for 36.5% of the output, equivalent to 499,969 mt/y. Volcan followed with an output of 151,216 mt/y, and Nexa Resources produced 90,132 mt/y, accounting for 11% and 6.6% of the production, respectively.

Zinc, the world's fourth most widely consumed base metal, is used to galvanize steel and in industrial sectors such as construction and automotive. Its price fluctuated mainly due to the impact of Russia's invasion of Ukraine, which led to an energy crisis in Europe and the suspension of operations at European zinc smelters, increasing supply fears and a rise in prices. In December 2021, zinc was trading a bit less than US\$1.5/lb, reaching a peak of US\$2.05/lb in April 2023. In this regard, and considering the energy crisis, Carlos Francisco Fernández Navarro, CEO of Volcan, stated: "Once the European energy crisis is resolved, energy prices will decrease, and smelters will resume production, reducing zinc deficit."

Besides being one of the largest producers of zinc, lead, and silver in the world, Volcan has several brownfield and greenfield exploration projects. Its most advanced project is Romina, where it has already completed the feasibility studies and is working on its financing to start operations in 2025. According to Fernández Navarro, Volcan has to invest in flotation cells and filters to treat the high base metal content in zinc and lead: "We are strategically leveraging the proximity of Romina to our Alparmarca mine, which is reaching the end of its life cycle. The proximity enables us to streamline investments in Romina's development, reducing the required investment and increasing the NPV and IRR," he added.

Besides being in the top three of Peru's zinc producers, Antamina and Volcan have a common thread in their ownership structure. Swiss-based mining and commodities trader Glencore has a significant stake in both companies, holding a 33.75% stake in Antamina and 23% in Volcan. This ownership arrangement has helped Glencore maintain its dominance in the zinc market, leveraging its control over two of Peru's largest zinc mines. However, more recently, things have shifted. When Glencore delivered the 2022 Full Year Results report, it announced that the company "commenced a process exploring the possible disposal of its 23.3% economic interest in Volcan." ■

Executive Insights

Closing the gap: connecting communities and mining



"Our goals are interrelated with consensus building with the Huancuire community. As of March 2023, we operate normally and seek to establish an understanding with them to develop the Chalcobamba pit, encouraging local activities and entrepreneurship."

Edgardo Orderique, General Manager, Las Bambas (MMG)



"We took the leaders of Chumbivilcas to Canada to show them how mining companies and communities coexist. This allowed them to return to Peru with renewed insights into mutually satisfactory relationships."

Javier del Río, VP South America and US, Hudbay Minerals



"We have established a strong relationship with the Ollachea community. One of the most significant milestones in this partnership is the 5% social participation we granted them in Ollachea's production, demonstrating our unwavering commitment to their development."

Diego Benavides, CEO, Minera IRL



"We work intensively with local communities. Of our 415 employees, 65% of our workforce is comprised of native community personnel, and all our services are provided by local companies."

José María García, CEO, Silver X



"We have extensive sustainability and environmental programs in which we also involve the community for them to benefit from and to understand the full aspect of our work."

David Kelley, President and CEO, Chakana Copper



"Our relationship with the communities is paramount and enduring, as they remain constant despite changing politics. Investing in the communities and building relationships is a long-term effort worth it for our stakeholders and the community, and we are committed to staying and continuing our efforts."

Ivan Bebek, President and CEO, Coppernico Metals Inc.



"We understand that our success depends on responsible ESG practices and strong relationships with local communities. By prioritizing these factors, we are well-positioned to acquire new projects."

Keith Henderson, President and CEO, Latin Metals

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Unleashing Peru's potential

Investment in exploration in Peru has been fluctuating throughout the last decade. The country reached a peak of approximately US\$900 million in exploration investment in 2012, that declined to approximately US\$216 million in 2020, due to the exceptional impact of the Covid pandemic. However, it has been progressively increasing from US\$334 million in 2021 to US\$429 million in 2022.

Streamlining permitting

Even though the exploration investment budget continues to increase yearly, there are several challenges that junior companies face, and one of the greatest is permitting. According to Sebastián Benavides, president of the ProEXPLO 2023 exploration event, Peru has to work on its competitiveness as an investment destination: "Permits can take up to a year and a half, considerably reducing competitiveness compared to other countries such as Chile or Canada," he pointed out.

Benavides explained that there were some initiatives and strides in streamlining the permitting process, like the Environmental Technical File (Ficha Técnica Ambiental). Nevertheless,

"From an investment standpoint, Antakori is of the scale that would alert the interest of all major companies at a time when the world requires substantially more copper to move towards a lower-carbon, green-energy economy."

**John Black, CEO,
Regulus Resources**



most projects are not eligible for this type of permit. As the world moves towards a more sustainable world where decarbonization policies will drive and boost exploration in other top-tier jurisdictions, streamlining permitting must be top of the agenda for current policymakers in Peru. "It is not a question of reducing socio-environmental standards but of adapting these processes to the status of the projects," emphasized Benavides.

Peru remains attractive for investors

Despite obstacles, Peru remains a highly desirable mining jurisdiction, particularly for mid-tier and major companies looking to expand their reserves and replenish their depleting pipelines. Proof of this is the recent investment from Rio Tinto in the Vancouver-based Regulus Resources: In January 2023, Nuton, a subsidiary of Rio Tinto, concluded a private placement financing deal with Regulus for a strategic investment of C\$20.5 million (approximately US\$15 million), giving Nuton control of over 16% of Regulus' common shares.

According to John Black, CEO of Regulus, large copper-gold companies have been monitoring their progress in their copper-gold Antakori project in Cajamarca. Now that Rio Tinto has a stake in the company, it plans to test Nuton's primary sulfide leach technology to produce copper cathodes on site, using less water and eliminating tailings, logistics costs, and interaction with smelters. "From both an ESG and financial standpoint, it could be quite a game changer," pointed out Black.

Leveraging its team's experience and knowledge of the geology of the Andean Cordillera, Regulus' thesis is to consolidate its land package with the mine adjacent to Antakori: TantaHuatay, an oxide heap-leach gold mine operated by Coimloache (JV between Buenaventura, Southern Copper, and ESPRO) that is expected to run out of ore in about four years. Antakori and TantaHuatay — "TantaKori" —, share a significant copper-gold sulfide deposit. "We are in a brownfield setting – it is much easier to develop a mine which is an expansion of an existing operation – and a combined 'TantaKori' project would provide long-term sustainable benefits for communities for generations," concluded Black.

Camino Corporation is a junior that has been working in Peru for several years, and currently has three assets: Los Chapitos, an IOCG (iron oxide-copper-gold) deposit; María Cecilia, a copper-porphyry project; and Plata Dorada, an early-stage copper-silver exploration



**Steve Stakiw,
President and CEO,
Element 29 Resources**



**Jay Chmelauskas,
President and CEO,
Camino Corporation**



**Patrick Elliott,
President and CEO,
Forte Minerals Corp.**



**Peter Dembicki,
President and CEO,
Tier One Silver**

project. At Los Chapitos, the company envisions an SX-EW heap-leach copper mine, and in January 2023, it entered a letter of intent to partner with Nittetsu Mining Co. After completing due diligence, Nittetsu could earn a 35% interest in the project by making a payment of C\$10.1 million (US\$ 7.53 million) over three years. Regarding María Cecilia, Camino received the permit to start operations in November 2022. It plans to drill the central portion to test for higher grades of copper and extend the strike of copper mineralization.

According to Jay Chmelauskas, president and CEO of Camino Corporation, the demand for copper is driven by electrification and by mines that have been in production for decades but are now depleting: "To maintain global supply and to meet rising demand, the copper industry requires more exploration discoveries and higher copper prices to incentivize production," he said.

Chakana Copper Corp. is another Vancouver-based company actively engaged in the development of its Soledad project in the Áncash region, situated in the highly productive Miocene mineral belt of Peru. The company has been drilling since 2017 and, in 2022, released an initial resource on a few of Soledad's tourmaline breccia pipes, including 191,000 oz of gold, 11.7 million oz of silver, and 130 million lb of copper. David Kelley, president and CEO of Chakana Copper, stated that the Soledad project has several attractive features that make it a valuable asset, including its location in an active mining district, its well-developed infrastructure and road access, and its diversified commodity mix. However, the project's most crucial aspect is its high-grade deposits: "With high-grade deposits, there is less environmental and social impact as the ore bodies are more compact and require less rock to be moved to get the same amount of metal out as a low-grade deposit," added Kelley.

2022 saw a flurry of activity with respect to drill campaigns. In Southern Peru, where Element 29 Resources owns its Flor de Cobre project, the company conducted a positive 12-hole drill program covering 4,532 meters at the Candelaria zone. As stated by Steve Stakiw, president and CEO of Element 29 Resources, it intersected significant copper mineralization and verified the previous historical drilling, and aims to use the new data to create a new resource estimate. The Candelaria target is a zone dominated by chalcocite above primary chalcocopyrite mineralization. When asked about how they envision to recover the mineral, Stakiw stated that chalcocite enables them to consider two potential recovery methods as they move toward production: "It

is possible to produce cathode copper just like with oxides, but it can also be floated in a regular concentrator and flotation circuit."

Leveraging a prospect generator business model, Latin Metals has made remarkable strides in transforming its Lacsha asset from a mere acquisition to a copper discovery. Keith Henderson, the company's president and CEO, states that the company prefers this model because it allows it to acquire projects at low costs, advance the portfolio, and establish strategic partnerships rather than being exposed to risk dilution from equity raises. For instance, Latin Metals established partnerships with AngloGold Ashanti and Barrick Gold in Argentina: "Our current focus is on advancing and finding a partner for our two most advanced projects, Lacsha and Auquis, which are both prospective for copper-molybdenum porphyry deposits," he added.

Paris Agreements boost demand of copper and silver

Climate change is a pressing global emergency that demands international collaboration and a well-coordinated framework at all levels. With the signing of the Paris Agreement in 2015, countries pledged to reduce carbon dioxide and greenhouse emissions, so that the world is expected to reduce emissions by 45% by 2030 and reach net zero by 2050.

To meet these goals, the world needs a rapid transition toward a low-carbon economy, but the main challenge remains in energy storage, especially in the energy and mobility sectors. The mining industry is destined to play a significant role in the decarbonization of the future by providing more minerals in order to stop relying on fossil fuels.

Several countries have taken action on this matter by securing their mineral supply chain for critical minerals, such as copper, lithium, nickel, etc., needed for energy storage, and particularly electric vehicles (EVs). For instance, in August 2022, the US passed the Inflation Reduction Act that enables businesses to receive tax credits for commercial EVs. Another example is Ontario, in Canada, which also published its first Critical Minerals Strategy in March 2022. Peru, the second largest copper producer behind Chile, has great potential to play a pivotal role in the trend toward an electrified future.

Copper is expected to be a cornerstone for all electricity-related technologies and a low-carbon future due to its electrical and thermal conductivity, and several other characteristics that turn

it into a critical component in energy applications. However, not enough copper is being produced to meet future demand. According to S&P Global, copper demand is projected to double from the current 25 million t/y to about 50 million t/y by 2035, leading to a potential copper supply gap of around 9.9 million tons.

Right now, copper is as strategic as gold is precious, and everybody is bullish on the red metal. Copper demand presents opportunities for both metals producers and junior companies leveraging Peru's copper endowment.

At an earlier stage in the value chain, Forte Minerals Corp. is a company developing copper and gold projects in Peru that shows particular optimism. With its Pucarini, Esperanza, and Don Gregorio projects in the permitting process, and waiting for the green light to start drilling, Patrick Elliott, president and CEO of Forte, said that it is focusing on acquisitions of projects that are already drill-permitted to help fast-track progress. "The company strives for value creation by advancing projects from target identification through resource inventory development," he said. By having GlobeTrotters Resource Group as a strategic project-generation partner, Forte Minerals has preferred access to its pipeline of early-stage projects.

Also leveraging the trend toward electrification is Tier One Silver. Silver shares practical uses with copper, being one of the best conductors of electricity. "As the world moves towards electrification, we will witness a rise in silver demand," stated Peter Dembicki, president and CEO of Tier One Silver.

Despite being a silver-play company, Tier One Silver has a base-metal story coming to light with high-grade copper samples and the presence of nickel at its Hurricane project.

The company is leveraging its team's track record: it was founded by Ivan Bebek and Shawn Wallace, who founded Keegan Resources in West Africa and then Cayden Resources in Mexico, subsequently acquired by Agnico Eagle in 2014. Dembicki explained that its silver Curibaya asset remains its focus, where Tier One Silver has been drilling in 2022 and was recently granted the DIA that encompasses the Cambaya area where it found signs of copper-porphyry mineralization.

Finally, Highlander Silver is a silver-focused company, currently exploring its Alta Victoria silver-polymetallic project. Highlander is encouraged by the results at the Santa Teresita target at Alta Victoria, where some intercepts are accompanied by alabandite (manganese sulfide): "We are very encouraged by the results at Santa Teresita and some intercepts, for example, the hole AV 22-14 with 7.9 meters of just over 230 g/t of silver equivalent. What we think is exciting is our interpretation of where we are in the system," said David Fincham, president and CEO of Highlander Silver.

The company also owns another property called Politunche. In 2022, Highlander purchased Solitario Zinc Corp.'s exploration work and integrated it into its database, helping to point out new areas where it is conducting geochemical samplings and detailed mapping. ■

Engineering, Consultancy and Contractors

ESG pays off

ESG factors have become an integral part of the mining industry, and compliance with these factors is necessary for sustainable practices and community engagement. Meeting these standards is crucial, and they are considered by investors and shareholders when deciding where to allocate resources. Good practices are rewarded while failing to comply with ESG factors can result in less investment flowing in the pipeline.

With the growing awareness of the impact on business on the environment and society, financial institutions such as banks are increasingly concerned with ESG factors and considerations. Such is the case of Banco Santander.

Fernando Kaelin Lizarraga, corporate banking manager at Banco Santander, is in charge of developing the recently founded Mining and Energy sectors in the Peruvian branch of the Spanish bank. He explained that the bank has a specialized area that regulates and verifies compliance with ESG factors when establishing commercial relationships with customers. "The mining industry is exposed to illegal and informal mining, especially in

gold production in certain regions of Peru. To avoid financing this type of mining and the negative aspects it entails, we emphasize tracking these situations," explained Kaelin.

Banco Santander offers a full range of services and products: from promissory notes, loans, or letters of guarantee, to bond issues, M&As, or syndicated loans. A recent case of their success is the purchase of Lagunas Norte from Barrick by Minera Boroo Misquichilca, which required financing and the substitution of a mine closure bond for US\$180 million.

A more integral approach

Worley is a company that offers sustainability-focused services in Peru. Franco Pedraz, Worley's country manager for Peru, asserted the company's commitment to providing decarbonizing solutions through its equipment manufacturing division: "At Worley, we have global expertise in electrified mining vehicles, power generation, and green fuels. We have built and designed many hydrogen plants and water treatment plants."

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Pedraz believes that the institutionalization of incentives like certifications for copper production through the use of green energy will gain importance: "These could generate added value for investors and, consequently, an incentive for mining companies to invest in sustainable production measures," he added.

On the topic of sustainability, according to Gustavo Bravo, mining director for Latin America and the Caribbean at WSP, mentioned that WSP's recent acquisition of the environment & infrastructure business unit of Wood has strengthened its capabilities in tailings management, design, and the application of new technologies under ESG criteria. WSP, which has been working at Quellaveco, offers co-disposal of waste rock with tailings, a technique that allows better usage of the geographical space. Continuing with the ESG factors, Gonzalo Covarrubias, general manager for WSP in Peru, added: "ESG criteria require a multidisciplinary perspective and a holistic view of the problems that in WSP we can address."

Environmental and social practices need the participation of the entire value chain, including firms and consultancies that provide project design and environmental and social strategy advice. Thus, Florencio Castro, vice president of the Peruvian branch of the Australian multinational Ausenco, explained that Ausenco approaches ESG factors from different perspectives. From a social angle, it participates in local community engagement to help manage a project's impact and maximize benefits from the outset. From an environmental perspective, it analyzes decarbonization strategies for new and existing projects, like the electrification of the fleet and the use of new technologies to reduce the use of water and energy resources. "At Ausenco, we have a team of environmental specialists in Lima who work closely with the engineering team. We conceive projects holistically to positively influence mining companies and communities while mitigating the environmental impact," explained Castro.

Castro highlights that despite a lack of new projects coming online in Peru, current projects keep growing. The company has noticed an interest in extending the life extension of current operations for which companies need new permits, a phase that is

"Peru's mining industry has a promising future due to global trends and demand expectations. With significant potential for growth and wealth, the industry's ongoing exploration and new projects are attracting long-term investors, making the outlook optimistic."

Florencio Castro,
Vice president Peru,
Ausenco



quite delicate from a social point of view. Thus, Castro highlights the importance of having the support of a local specialist who knows the legislation well and works closely with the technical team: "Deficiencies in the permitting strategy can have a major impact on both the project itself and the timeline," he warned.

Water matters

"We are draining humanity's lifeblood through vampiric over-consumption and unsustainable use and evaporating it through global heating," warned António Guterres, secretary-general of the United Nations, in the first water conference in almost half a century in New York. Besides decarbonization and gas emissions, water scarcity is at the front of the global climate change agenda.

Some of Peru's most critical mining operations are in regions at risk of water scarcity, such as Arequipa, one of the top-producing regions in the country. Thus, community concerns related to mining include the pollution of underground and surface water by leaking mining waste and the excessive consumption of fresh-water for the extraction and processing of metals. Among envi-

"The transition to underground operations could be decades away, but to ensure a smooth transition, design and planning decisions need to be met now to avoid interference between current open-pit operations and future underground operations."

Alberto Coya,
Country Manager
Peru & Regional Lead
Latam, Stantec



ronmental concerns, we find tailings, a by-product of the metals and minerals recovery process, at the forefront. The management of tailings represents a long-term responsibility for mining companies, and due to its high environmental footprint, it can hinder the process of bringing new projects online.

As one of the top global metal producers, Peru understands the responsibility for maintaining proper tailings, and tailings management has not only improved in Peru but worldwide. The disasters of Mount Polley (Canada), Samarco and Brumadinho (Brazil) served as a reminder that the necessary standards were not widely in place in the industry. After Brumadinho, the International Council on Mining and Metals (ICMM), together with the United Nations Environment Programme (UNEP) and the Principles for Responsible Investment (PRI), established the Global Industry Standard on Tailings Management (GISTM) in 2020, mandatory for its members. Today, several operators in Peru are already adapting their facilities to the guidelines' recommendations or the ones from the Canadian Dam Association (CDA).

Javier Mendoza, general manager of Anddes, an environmental, engineering and construction management consultancy, agrees that there has been progress regarding tailings in Peru. Still, national standards remain outdated: "National standards represent a problem for mining companies when reassessing their units for a possible sale," stated Mendoza.

Anddes has worked on projects like Quellaveco and maintains an integrated contract with Las Bambas. Moreover, it developed a technology platform, AUDAS, which detects and reports earthquakes almost instantaneously, and it is being implemented at Minur, Raura, Marcobre and Antapaccay.

Arcadis is a consultancy and engineering company that also has experience working on tailings. According to Fredy Alejandro, Peru country manager of the company, Arcadis led the engineering of around 90% of tailings dams in Chile and, in Europe, they have been working with renewable energy: "In South America, we have approached local investors to look at potential renewable energy projects applied to operations in the mining industry; for example, solar panels could be implemented in the tailings dam lagoons to prevent evaporation," pointed out Alejandro.

Related to its tailings practice, Arcadis has capabilities in water management, and is working with Southern Peru on the engineering for a treated wastewater pumping system from Ilo city to the tailings dam at Toquepala, 120 km apart.

Several companies in the mining industry have begun to include the figure of the Engineer of Record (EoR). The EoR is responsible for the design and construction phases of tailings facilities. Reflecting on this incorporation into the Peruvian mining industry, Alberto Coya, Stantec's country manager for Peru and regional lead for Latin America, noted that the new guidelines of the ICMM and the heavy competition for qualified personnel have widened the talent gap in tailings engineers: "In some cases, companies demand full-time Engineers of Record, creating an additional challenge because the EoRs will not be available for other operations," added Coya.

SRK Consulting Peru's director, Antonio Samaniego, agreed with Coya about the lack of qualified engineers, stating that legislation has mixed the personal liability of the individual with the liability of the consulting firm: "Bearing the responsibility of a potential tailings failure is a burden for the engineers' career. This has reduced their willingness to take on these types of job positions," he explained.

Resource optimization

Mining companies, consultancies, and contractors in Peru have focused on resource optimization, using various techniques to reuse tailings, recover water, and improve safety measures in tail-

ings management to minimize the risk of collapses and leaks that could pollute freshwater sources. According to Orlando Bravo, engineering manager at Klohn Crippen Berger, the Peruvian mining industry has focused on conventional tailings disposal. However, accidents like Brumadinho led operators to review the feasibility of other technologies, such as filtered or paste (also referred to as thickened) tailings. This transition, however, is gradual and subject to various factors: "The change in tailings technology is not immediate and depends on some variables such as tailings production line adjustments, investment costs, climatic conditions, and required production volumes," added Bravo.

Bravo emphasizes that there is no universal solution for tailings dams, and these technologies' application or feasibility depends on each case. Operating cost is part of the variables to be evaluated before selecting each technology. For example, Bravo explains that switching to pasty and thickened tailings can carry higher economic costs than filtered tailings because of the particular types of pumps required for transportation and the disposal of gradients: "In the case of thickened tailings, these reach 65% solids, which requires pumping the slurry from the process plant to the thickening plant, and the thickened tailings to the tailings storage tanks utilizing pumps," he added.

For his part, José Luis Lara, general manager of Lara Consulting, agrees with Bravo regarding the efforts and measures made to reduce the impact of tailings: "The idea is to reduce the density of the material to minimize the impact in the event of a disaster.

We are also developing technologies to reduce waste production and reuse materials," he explained.

Lara Consulting is working with Minsur and Buenaventura on projects to recover minerals from tailings: "The technology for processing minerals has improved, allowing us to recover materials that were previously considered waste," continued Lara.

Lara Consulting wants to establish a laboratory and venture into research and investigation. The laboratory's ultimate goal is to become a profitable business unit where Lara can partner with universities and collaborate on tailings research. "Although research is not a highly developed front in Peru, we hope to establish alliances with different universities, especially with Australian educational centers, to collaborate in research," added Lara.

Open-pit is the king

According to the Ministry of Energy and Mines (MINEM), out of the 47 projects in its investment 2023 portfolio, 24 are open-pit mining projects with a total investment of US\$39.4 billion, representing 73.3% of the total investment in the portfolio. Noteworthy projects on this list include Antamina's Reposición Antamina in Ancash, Teck's Zafranal in Arequipa, and Chinalco's Toromocho Expansion in Junín, with an overall investment of US\$4.43 billion. Toromocho's expansion is under construction, while the other two projects are expected to commence construction in 2023 and 2024, respectively.

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"The ICMM has become the global governing body for tailings management, increasing the demand for high safety standards. This process will take years, creating a high long-term projection where construction and safety companies may not meet the demand."

José Luis Lara, General Manager, Lara Consulting



"Peruvian mines are gradually adopting new international guidelines for tailings management and incorporating them into their operations. All engineering will be executed under these standards within five years, enabling greater sustainability and socio-environmental responsibility."

Javier Mendoza, General Manager, Anddes



"International regulations for tailings dams provide a useful guide for developing projects responsibly and sustainably and can help establish corporate governance focused on socio-environmental responsibility, making the process more orderly and effective."

Fredy Alejandro, Country Manager, Arcadis



"Wood's Environment & Infrastructure business unit strengthened our capabilities in tailings management, design, and the application of new technologies under ESG criteria. We aim to optimize water usage and minimize environmental impact and energy consumption."

Gonzalo Covarrubias, General Manager - Peru, WSP



"As communities become increasingly receptive to exploration activities, effective communication with them is essential to ensure they understand the implications and processes involved."

Antonio Samaniego, Director, SRK Consulting Peru



"As the market evolves, shareholders will prioritize carbon mitigation initiatives and demand 'green metals'. Companies that fail to meet these demands may face challenges or even risk going out of business."

Franco Pedraz, Peru Country Manager, Worley



"We have a specialized area that regulates and verifies compliance with ESG factors when establishing commercial relationships with customers, which Santander's global offices back up."

Fernando Kaelin, Corporate Banking Manager, Banco Santander



"At the social level, we give operational training for our personnel in the communities where we operate. The mining companies require that 100% of our unskilled personnel belong to the community in the area of operations."

Rafael Ríos, Country Manager, Construplan

For Pilotes Terratest, an engineering company specializing in foundation work and part of the Echevarría Izquierdo Group, 2022 has been a successful year since they were capable of completing two critical projects for Marcobre and Mina Justa. According to Swarton del Águila, business development manager of the company, their work is fundamental since 90% of the mining infrastructure needs pile foundations: "Peru ranks eighth in the world regarding seismic energy released; thus, all construction projects are designed with piles as a precautionary measure".

Besides the seismic nature, Peru presents a diversity of soil that affects mines and tailings dams; thus, Pilotes Terratest introduced several technologies for both soils as well as tailings dams to make structures safer and to increase the resistance or bearing capacity of the soil: "In 2020, we introduced Jet-Grouting technology in Peru, which consists of high-pressure injection into soils, as well as Soil Mixing technology; a technology applicable to tailings dams" added del Águila.

Construplan, a Mexican company that recently entered Peru, also experienced positive results in 2022, surpassing expectations. Rafael Ríos, its country manager, mentioned that the company prequalified for important projects with Southern Copper, and even got its first contract with Nexa Resources: "We were awarded a project for Nexa Resources in Cerro de Pasco: the main one in El Porvenir and two others in Atacocha."

"We are transforming our company's profile by not only advancing in drilling technology but also by integrating innovative technologies and services for our mining clients. Our strong entry in these areas in 2022 paves the way for continued growth and consolidation in 2023."

Belisario Tijero,
General Manager,
Master Drilling Peru



Hispe, a modular construction company, also achieved significant milestones. In 2022, it constructed eight three-level modular hotels. The company served Marcobre, Volcan, and Chungar, building offices, modular dormitories, and detailed engineering for a camp. Jose Luis García, general manager of Hispe, highlighted the environmentally friendly character of modular construction: "Modular construction is environmentally sustainable because we generate a minimum amount of waste, which is returned to the plant to be reused, especially when it comes to wood or cardboard materials."

Diversification is the key

Like many other players in the Peruvian mining value chain, mining contractors had to broaden their range of services in order to maintain a steady flow of activity. In response to a decline in greenfield projects, STRACON, a key player in the Peruvian mining sector, has implemented a strategic approach to sustain its operations by diversifying its services portfolio and expanding into other jurisdictions. The company signed a contract with Curimining (a joint venture between Adeventus Mining and Salazar Resources) for the preconstruction, construction, and operation of the El Domo project, the third mine in Ecuador.

The company also recently acquired AMECO, which provides construction support services and fleet management solutions. With this acquisition, STRACON can create more synergies between its sister companies: STRACON Tech and the Canadian Dumas: "AMECO will facilitate our access to the mining market in Chile. With the contribution of the four companies, we offer integral solutions to our clients from Canada to Chile," asserted José Luis del Corral, international VP of STRACON.

In Peru, the company that worked at Anglo American's Quellaveco, Hubday's Constancia, and Pan American Silver's Shahuindo and La Arena has also diversified its business: "In 2022, we worked in earthmoving, civil works, and pipelines, but diversified into equipment support and maintenance service for Las Bambas," asserted John Tamayo, VP and general manager of the Peruvian branch of the company.

Pevoex, another Peruvian contractor, had to diversify activities, including additional services and other sectors. Rómulo Mucho, Pevoex's general manager, commented that he has been working on mine closure and environmental remediation services, explaining: "It is an important niche because it is an imminent requirement for all mines."

Mur-Wy Sac also expanded its portfolio of services during 2022 and showed a growth of 20% in sales throughout the year. The company offers a wide range of services to mining companies, such as mining and hauling of minerals for Gold Fields and Min-sur; drilling and blasting services for Antamina and Minera Boro; repair and equipment maintenance, a business unit where the company grew considerably during 2022 with contracts with Chinalco, Southern Peru, and Antamina; and transportation of oversized cargo and yellow equipment. However, Luis Flores Izquierdo, general manager of Mur-Wy Sac, explained that in addition to important contracts with large mining companies, the growth during 2022 is also explained by the launch of a new infrastructure business unit for road construction.

Flores hopes this growth will continue in 2023 as Mur-Wy Sac hops into the electrification and decarbonization trend. The company is evaluating the possibility of implementing a test of electric dump trucks for the hauling area at a mine during Q3 2023. However, this is not an easy task due to the trucks' large tonnage and rugged terrain: "One of the main challenges in integrating electric equipment is that we generally work with 45 to 50-ton dump trucks, which represents a problem for the braking system in areas with steep slopes and heights above 3,500 meters above sea level," commented Flores.

With a lack of new greenfield projects on the horizon, it will be critical for service companies to remain innovative and adaptable to continue to thrive in this sector, something that we are witnessing.

The future is underground

The vast majority of Peru's mining production comes from open-pit operations, such as Antamina, Las Bambas, Cerro Verde, Toquepala, and now, Quellaveco. However, as open-pit operations

"We expect to consolidate the eLION portfolio's position in the market and begin commercializing compact hydraulics products, for whose sale and service we will hire additional personnel in 2023."

Kai Rothgiesser,
General Manager -
Peru, Bosch Rexroth



"Innovation and industrial safety are part of our work philosophy. We provide technological developments to adapt to our clients' needs, as well as industry improvements for the safety and working conditions of our employees."

Eduardo Cossio
Chirinos, CEO,
INCIMMET



become very deep, hauling costs make the mineral more expensive to extract, and this is encouraging some of these massive operations to go underground, a transition already completed in other mines such as Chuquicamata in Chile. According to MINEM's figures in its investment 2023 portfolio, underground

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projects represent an overall investment of US\$5.7 billion, 10.7% of the entire portfolio amount. Buenaventura's San Gabriel is the only one that began construction in 2022. The underground development of Yanacocha, as the mine transitions from oxides to sulfides, represents one of the largest single investments in Peru's mining industry. Delayed until 2024, it presents a capex of US\$2.5 billion, and is set to provide substantial opportunities for underground contractors.

Such is the case of AESA, a Peruvian underground contractor part of the Breca Group, who won a tender for the integral development of the Yanacocha Sulfuros project, together with Redpath Mining of Canada. "The migration of projects from open-pit to underground mines are large-scale operations that require skills that the client often does not have. To serve this market segment, we thought seeking a strategic partner was the best route," pointed out Gianflavio Carozzi, AESA's CEO.

In 2022, AESA reached an all-time high in sales with 35% growth compared to 2021. According to Carozzi, in recent years, mining companies have been trying to consolidate the contracting services in a single operator. Thus, they have been focusing on improving their capabilities to offer a better all-round service.

While open-pit operations represent the bulk of Peru's mineral production, there are very significant medium-size underground operations, such as Cerro Lindo, Condestable and Marcapunta Norte, which is expecting to ramp up operations this year. A good portion of these smaller operations are in the hands of Peruvian players. Many executives believe that the growing importance of underground operations is unavoidable and that the underground mining landscape in Peru is set to change: "In a few years, the situation in Peru will begin to be similar to Chile: a mining industry with large underground mining projects operated by transnational companies," anticipated Alberto Coya, Stantec's country manager.

For Coya, underground operations provide several benefits in terms of ESG and permitting. These operations require smaller surface areas to develop new mines, and this could streamline the permitting processes.

"Training in the underground segment is a pending task in the industry. Current hiring conditions create a vicious circle where experience is valued, limiting formal training. Our programs aim to break this cycle and promote professional mobility."



Gianflavio Carozzi, CEO, AESA

Paul Murphy, manager of Mining Plus' South American Office, agreed: "Existing open-pit mines are coming to the end of their lives, but they still have good mineralization beneath them."

Mining Plus provides geological, mining and geotechnical engineering services throughout the entire project lifecycle. According to Murphy, companies come seeking for underground mass mining studies, methods that are not common in Peru, but it leverages the company's international expertise in the underground space. However, he highlighted that the Peruvian exper-

tise in large pits attracts interest from all over the world: "The skillset in Peru is truly world-class and something the country should be very proud of."

One of the main challenges of this transition is the optimal timing to switch from an open-pit to an underground operation. Murphy stated that the right moment may not be when the mine reaches the end of its life and that the two mining methods may even work in parallel, adding that mining companies often do not consider this switch early enough: "The key is to know early, so better decisions can be made, and importantly, so the right data can be collected to make those better decisions," stated Murphy.

Eduardo Cossio Chirinos, INCIMMET's CEO, also highlights that underground mining is more aligned with ESG standards and generates fewer impacts on communities: "For example, underground operations involve less surface disturbance, which mitigates friction with local communities. Moreover, mining technology has undergone significant developments to increase production volumes and improve productivity."

INCIMMET has positioned itself as the premier contractor at Cerro Lindo, one of Peru's largest underground mines. Even though the company has been focusing on consolidating its strategic relationship with its clients, such as Nexa Resources and Buenaventura, it was recently awarded two projects with Minera Poderosa and Raura, further solidifying its position in the industry.

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INCIMMET has also made strides on the innovation and technology front to improve safety in the underground space, and is developing a drone with a camera integrated and an algorithm that leverages Artificial Intelligence, which can predict rock falls, one of the leading causes of fatal accidents in underground mining in Peru.

Underground mines in Peru are characterized by narrow-vein operations. In this sub-segment of the industry, several companies flourish, establishing leading positions in the development of equipment and services for this niche. Robocon provides a full range of services ranging from shotcrete production and contracting to slick lines, and has worked with different mining companies, such as Pan American Silver, Sierra Metals and Hochschild.

According to Enrique Sattler, Robocon's CEO, the distance and depth of Robocon's customers has increased throughout the years, leading to the exploitation of narrower veins and the use of tunnels of just 2.40 meters diameter. Thus, it manufactured the Technoshot and Technomix range of mini-robots for shotcrete application and transportation with a width of 1.60 meters and a height of 2.20 meters. Moreover, the company has been working on the electrification of its equipment. Sattler commented that it plans to leverage Bosch Rexroth's eLION portfolio of products for electrification.

Robocon is one of the shotcrete contractors affiliated with EF-NARC (European Federation for Specialist Construction Chemicals and Concrete Systems). Being a member of this federation allows it to certify its shotcrete operators and break into the European market where this certification is mandatory: "We have

"In 2023, we updated the VMX and VMX MAX auxiliary trucks for mining. These medium-heavy trucks range in gross vehicle weight from 16 to 34 tons and feature a new Volvo engine and seventh-generation I Shift gearbox."

Jorge Masías,
General Manager,
Volvo Group Peru



increased our interest in Spain, a country with great geological potential and where mining is reviving thanks to technological advances. We believe there could be a boom in underground mining there," added Sattler.

Like major OEMs, Bosch Rexroth, the German hydraulic specialist, has identified a niche in electrification with its eLION technology. This system is an alternative to combustion engines and can contribute to reducing energy costs. The modular portfolio for the off-highway sector includes inverters, gearboxes, software, and coordinated hydraulics. On the other hand, Bosch offers BO-DAS, a digital ecosystem of IoT solutions that enables customers to monitor and control the machine. Kai Rothgjiesser, general manager of Bosch Rexroth Peru, revealed that the market is asking for open-platform solutions to integrate equipment from different service providers: "There is no single provider in the market that can simultaneously offer all services," he explained.

Master Drilling, the South African multinational and global leader in providing drilling services to the mining industry, is a pioneer in raise boring equipment and services, and, over the last years, it has ventured into "raise shotcrete". According to Belisario Tijero, general manager of the Peruvian branch of Master Drilling, the shotcrete market has rapidly expanded in Peru due to the country's challenging terrain: "Structures such as chimneys were impossible to construct, but today, shotcrete offers a feasible alternative to the manual construction method, replacing blasting and reducing the risk of accidents and fatalities," said Tijero.

The "raise shotcrete" method consists of a cycle of advancement in stages where the reaming is interspersed with shotcrete: "As soon as a few meters of reaming are done, the operation is stopped to introduce a shotcrete head and start the coating. This prevents the soil from coming into contact with oxygen and the chemical reaction that leads to the collapse of the chimney," explained Tijero.

Master Drilling's general manager also asserted their goal to change the company's profile into a more technological one. Thus, the company acquired AVA Solutions, a fleet management solutions company, and a 25% stake in A&R Group, an underground control system company. "We are incorporating new technologies and services for our mining clients, a segment where we gained momentum in 2022 and expect to continue to consolidate in 2023," concluded Tijero. ■

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Equipment and Services

Forestry a thriving ecosystem through innovation and technology

The main technological trends shaping the Peruvian mining landscape include digitalization, automation, and the electrification of equipment. Thanks to a robust ecosystem in the Peruvian equipment and components segment, what seemed impossible a few years ago is becoming reality.

Ancillary equipment: looking for fuel efficiency

While the European Commission and policymakers are debating the new Euro 7 standard, tightening limits on health-harming pollutants for trucks and vehicles, Peruvian legislation requires vehicles to meet the Euro 4 standard.

However, this lack of progress in environmental policies has not stopped different OEMs from introducing engines with Euro 5 or 6 standards. Such is the case of Swedish Scania. Eronildo Barros, Scania's managing director in Peru, mentioned reducing emissions thanks to telemetry that can measure fuel consumption. Scania Peru has seen tremendous growth in recent years, driven primarily by the mining industry, which accounts for 45% of its business: "Scania Peru has doubled its market share in 2021 and 2022 and has experienced an average growth rate of 17% yearly in both new and pre-owned truck sales," asserted Barros.

The company is currently present in 11 mining projects, and their most popular configurations include the P450 and G410 6x4 setup and its G540 8x4 Heavy Tipper, which boasts a load capacity 40% greater than other vehicles. "We have recently launched the Heavy Tipper 10x4 with a powerful V8 engine, which provides exceptional performance and increased efficiency," concluded Barros.

Another Swedish OEM, Volvo, also demonstrated a robust performance in 2022. The company's market share in trucks over 16 tons reached a record high of 25.7%, marking a growth of 3.5% compared to the previous year: "The positive price of minerals contributed to the growth of mining dump trucks, and 50% of our sales were due to this segment," added Jorge Masías, general manager of the Peruvian branch.

Regarding green solutions, Masías explained that Volvo is exploring the use of "green steel", steel produced without generating CO2 emissions. Moreover, the company has a comprehensive portfolio of battery electric trucks; the FH, FM, and FMX, models are set to be launched in Chile and Brazil this year. However, introducing these models in Peru is subject to the availability of necessary infrastructure and suitable conditions that will enable electromobility. When asked about new vehicles in Peru, Masías anticipated the launch of the VM auxiliary trucks line for mining. These are medium-heavy trucks with a gross weight between 16 to 34 tons. "The new trucks will come with a new engine and will have a lot of components in common with heavy-duty trucks," he added.

Electric equipment on demand

From Australia to Chile, open-pit operations have been leveraging automation for several years. It is well-known that Quellaveco

is the first 100% digital mine in Peru, and Epiroc has been playing its part in contributing to this eagerly awaited mine, providing Anglo American with six autonomous Pit Viper PV351 drill rigs and three pre-cutting SmartROC D65 drills. The Pit Vipers can automatically drill while supervised from a common control room, while the SmartROC series allow for visual remote operation.

Besides automation, Epiroc has been working on decarbonization. Ángel Tobar, Epiroc's general manager for the Andean region, stated: "Our goal is to have electric alternatives for all of our underground equipment by 2025, and by 2030 for the open-pit equipment."

To meet the increasing demand for eco-friendly solutions, Sandvik has opted to use less polluting diesel engines and has developed a new generation of battery-electric equipment that generates almost no pollution. Sandvik also acquired Artisan, a California-based firm that specializes in producing batteries and battery-operated equipment.

Sandvik opted for lithium iron phosphate (LFP) batteries instead of nickel manganese cobalt for safety reasons: "Besides their good density, LFP batteries have a high-impact absorption capacity that

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"Epiroc understands the importance of blending digital and 'green' technology solutions, ensuring that our equipment enhances working conditions and operators' well-being while respecting the environment."

Ángel Tobar, General Manager Andean Region, Epiroc



Another underground equipment manufacturer active in Peru is Finland-based Normet, which recently launched the SmartScan that, using 3D laser scanning, eliminates the need for manual probing of the sprayed concrete thickness. Normet is also working on the SmartDrive, a modular battery electric vehicle architecture. "Our equipment has worked very well in Chile, so we will test how it adapts to the Peruvian mine configuration. Although the number of electric equipment in Peru is not high, the trend toward electrification is clear," said Franklin Pease, general manager

Mining goes digital

Many argue that innovation and digitalization are pending tasks in the mining industry, but nothing could be further from the truth. According to a report by Ernst & Young published in 2022, Peru features 68 points in the Digital Maturity Index in the mining industry, 4% more than the Latin American average and almost 8% more than the results from 2021. According to the same report, the Peruvian mining industry's budget for digitalization and technology has increased by 5%.

As stated by Carlos Travezaño, Peru and Ecuador's CEO of Siemens, machine learning has been a game changer in the mining industry, enabling companies to gather vast amounts of data, obtain valuable insights and optimize processes, and that the AI has been proven to play a fundamental role in preventive maintenance. However, collecting data alone is not enough to optimize productivity and profitability in a mine: "It requires a sophisticat-

ed analysis process to transform data into actionable information and facilitate strategic decision-making," said Travezaño.

regarding machine learning, Fernando Sagastegui, CEO of Astay Systems, says around 5% of Peruvian mines use machine learning, which sounds good and works but needs a previous step: digitization and data integration. "Digitization requires a significant economic investment, a fact that particularly affects mining units that are nearing the end of their life cycle," he said.

Astay, a software solutions provider, was founded by Sagastegui amid the pandemic, when he saw an opportunity in the software segment dominated by big players: "Large technology providers offer standardized packages developed in other parts of the world that do not necessarily resemble the Peruvian reality," he said.



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"Through our recent acquisition of Motion Metrics, an AI tech development company, we aim to enhance data management accessibility for our customers, improving safety, efficiency, and sustainability in their operations."

Karina Zevallos, General Manager, Weir Minerals



ed analysis process to transform data into actionable information and facilitate strategic decision-making," said Travezaño.

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Like many other players in the mining value chain, SGS, one of the world's leading testing, inspection, and certification companies, has diversified its business units by leveraging artificial intelligence. In a conversation with Álvaro López Derpich, executive director of the Peruvian branch, he explained how their geometallurgy pilot plant showcased at Perumin 2022 had gained momentum. "The pilot plant incorporates cutting-edge technology, including a digital twin that employs an algorithm to predict and simulate similar metallurgical processes with different outcomes," he explained.

Zyfra, a Russian-Finnish company, has been helping mining companies digitize and integrate their operations since it entered the Latin American market a few years ago. In a conversation with Víctor Huaco, the Latin American director of the company, he stated that the Q1 of 2023 was characterized by an increase in demand for solutions that reduce the use of fossil fuels in a context where mining companies have a limited budget: "The mining industry turned to solutions that can reduce fuel consumption to save in terms of costs."

In this context, Zyfra has two independent but complementary solutions. The first solution involves introducing hydrogen and oxygen molecules into the vehicle's combustion process. The second solution is a "digital advisor" that utilizes AI to generate an optimal algorithm, indicating to the operators which route to take to minimize fuel consumption. "Both solutions can lead to savings of up to 10% and reduce the carbon footprint of operations," he asserted.

Besides leveraging AI solutions, ABB's clients also joined the trend toward reducing fossil fuel consumption to achieve their ambitious decarbonization goals. The company has recently signed an agreement with a global mining company to study the

implementation of eTrolleys to reduce CO2 emissions, which also have the advantage of being up to 20% faster than combustion trucks: "eTrolleys are the only commercially available solution for electrifying large trucks of 200 to 400 tons, and its implementation can be gradual depending on the mining strategy of the operators," stated Ricardo Begazo, ABB's local division manager.

A company that has been venturing into the underground space is Torsa. The Spanish firm, specializing in research, development and manufacturing of technological solutions for heavy industry, has initiated the development of its UGM device, an anticollision system for underground operations that is being tested in Chile. "We expect it to be available from May 2023 so we can start underground testing in Peru," said Alonso Quiñones, Torsa's country manager.

Torsa works at Marcobre's Mina Justa and Glencore's Antapaccay, and also offers digital solutions, including Torsa Cloud, a business intelligence platform that provides its users with the information to identify and track the parameters related to their KPIs and optimize their activity.

MS4M is a Peruvian company that debuted in underground mining systems in 2022 with the introduction of its C4M Underground system. Founded in Cajamarca by a team of users in fleet management and mining operations, they decided to produce technology that meets the needs of Peruvian mining companies: "Our hardware is developed in Lima and the software in Cajamarca. This translates into great flexibility to adapt our innovations to the needs of our customers," explained Richard Balboa, LATAM vicepresident of the company.

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Ancillary technologies

Innovation in open-pit and underground equipment could not be possible without the external development of key components. Component companies are also hopping into some of the most relevant trends in digitalization and electrification and gathering crucial data from the equipment to optimize operations.

On the compressor technology side, Atlas Copco has developed several innovative solutions to improve and optimize air compressors. Atlas Copco offers the Elektronikon, a controller system installed in each compressor that uses the IoT, allowing remote monitoring and energy conservation. It also collects data from the sensors, processes it, and delivers it for an overview.

Julio Hernández, general manager of Compressor Technique - Atlas Copco Andean Region, asserted that this year Atlas Copco will launch AIRPlan in Peru, an all-inclusive contract for compressed air delivery where the company maintains the ownership of the equipment, while the customers pay a flat rate and a variable rate according to the compressed air intake. "This all-inclusive contract has gained momentum in Colombia and Brazil, and we have noted a similar trend in Peru," said Hernández.

Martin Engineering is also leveraging autonomous and remote-control technology for its solutions. The company's primary focus is to promote solutions in the material handling space to decrease the need for maintenance and manned activities. As stated by Eduardo Espinosa, the company's general manager of the Andean Region, the next step will be to control the equipment remotely to re-

"Our vision goes beyond just autonomous operation solutions. We aim to provide our customers with relevant and timely information for efficient asset management through the diagnosis and monitoring of equipment."

**Eduardo Espinosa,
General Manager
Andean Region,
Martin Engineering**



duce the human presence around conveyor belts. "By keeping staff away from risk areas, we can improve their safety," said Espinosa.

In the material handling space, Weir Minerals seeks to provide its clients sustainable and efficient solutions that extend the useful life of the assets. In the grinding process, Weir has high-pressure rollers capable of generating energy savings of 30%. The company developed Synertrex, an intelligent platform and ecosystem that combines data analytics with AI for operations monitoring. "Synertrex can alert when the equipment changes state, ensuring more efficient and higher quality sorting," explained Karina Zevallos, general manager of Weir Minerals.

The multinational company, which worked extensively with Quellaveco supporting its transition from the construction phase to operations, has partnered with Eriez Flotation to develop coarse particle flotation systems that avoid the need to grind the rock. "We are currently quoting to implement this method in large-tonnage mines in south Peru," said Zevallos.

Mepsa - Aceros Chilca, a foundry, is approaching its 59th anniversary of producing and selling inputs for the comminution process, such as castings and forged and rolled grinding balls. Despite the political and social context in 2022, marked by stoppages and blockades that affected the arrival of supplies, the company also faced challenges imposed by cheaper Asian products. However, Juan Moreyra Marrou, CEO and general manager of Mepsa-Aceros Chilca, asserted that the company beat its record turnover. "We are making a series of investments to improve our products. We have a plant that is not at its maximum capacity, representing an opportunity to increase sales volume," said Moreyra.

Drilling services: looking for safety

Drilling companies are not lagging behind in terms of innovation. Jorge Granda, COO of AK Drilling, highlighted the implementation of mechanical automation systems: rod handlers and preventive systems, such as guards that deactivate the equipment when it detects that the operator enters risky areas. However, there is general agreement between drilling companies that it is impossible to implement 100% automation: "Full automation in drilling is not possible because it requires the operator's expertise," stated Granda.

The fact that automation solutions cannot substitute specialized driller operators entails two additional implications for

"100% drilling automation is impossible because the operator's expertise is still required. Thus, we need a safety management system that fosters continuous training and a sense of ownership and accountability for actions."

**Jorge Granda, COO,
AK Drilling
International**



drilling service companies: they need to implement measures to guarantee their workers' safety during operations and design effective strategies to attract and retain talent.

Regarding safety measures, AK Drilling has well-established safety protocols that generate behavior patterns enhanced with continuous training. By transferring knowledge with continued training, they can implement risk-mitigation measures based on experience while encouraging good practices. In this context, Jorge Granda added: "It is crucial to have a skilled workforce to reduce the odds of accidents and, in AK Drilling, we have a well-structured safety department that can get feedback from our events, as well as industry events."

On the other hand, MDH's general manager, Daniel Santa María Stein, stated that the lack of universities or institutes that provide technical expertise in drilling poses a challenge when it comes down to finding good drill operators, especially for remote or difficult-to-access projects. "Although at MDH we train our operators, it is a process that takes between three to four years, so demand exceeds the supply of drillers in the short-term."

Miguel Ángel Arenas, Geotec's general manager, shared that 2022 was a year that put the company's resilience to the test since social unrest triggered by political events has also taken its toll on them, and seven of Geotec's machines were damaged by protesters. However, Arenas highlights that the loss of jobs resulting from the destruction of the machines outweighed the financial impact of the incident: "The livelihood of several families relies on the burned and destroyed machines, and under current trade conditions, it may take over a year to obtain replacements," he said.

Geotec currently has eight Epiroc and two Boart Longyear rigs that are 100% automated with rod handlers. Arenas explained that through a collaborative program that began in February 2023 with its equipment supplier, Epiroc, Geotec is promoting the inclusion of women operators into its team. "The program will run until Q4 2024, which, although long, is the time required for a person to become a driller," he pointed out.

G&G, a drilling company based in Peru, prides itself on its emphasis on customization. According to Marcos Garayar Guevara, the company's general manager, since G&G's inception, it has been designing and manufacturing equipment to suit the specific needs of its clients to reduce costs related to space, and equipment transportation. "One of our latest equipment is the Midas 200, a compact yet powerful rig capable of drilling up to

"With Layne, a Granite company, as a shareholder, we gain financial support and guidance in adopting new technologies and innovation alternatives."

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



400 meters. Another example of G&G's customized equipment is the FD1000, which features a robotic arm that enhances productivity and improves worker safety," added Garayar.

Noé Vilcas, CEO of Explomin, highlights that world-class mines in Peru compensate for the lack of exploration in greenfield projects in Peru. "At Explomin, we serve both open-pit large mining and medium underground mining, which allows us to avoid seasonality in drilling campaigns and maintain constant drilling services," he said. Vilcas stated that their main goals are organic growth and drilling one million meters yearly: "We are looking to decentralize our company to operate in a standardized way in other jurisdictions. We want to transfer our know-how to other countries faster than we have in recent years," he added.

Logistics and transportation: an intrinsic part of the mining industry

An efficient transportation and logistics services can lower costs, promoting the development of mining activity, especially in the high Andean territories, where most mining activities in Peru occur. Companies tend to generate logistics corridors with opportunities to boost the economy of remote regions. However, the Peruvian mining industry faces several challenges in the sphere of logistics, some of them deep-rooted, such as the lack of proper infrastructure, and others related to the recent social unrest. Logistics companies could leverage the few airports that Peru has, but some of them have been closed, imperiling transportation of supplies and people.

Peru has deficient infrastructure. Antonio Berckemeyer, general manager of Transber, said that Peru not only does not have adequate infrastructure, but it is not standardized: "If we do not address these issues, logistics cost will end up exceeding our client's budget, and they may decide to invest in countries with better infrastructure and fewer social problems."

For Transber, a company that works with Anglo American, Newmont, Buenaventura, BHP, and Miski Mayo, diversification has been the cornerstone that allowed them to bypass difficult times. Transber ventured into technological innovation to develop TransberApp, a mobile application that allows clients to request air freight services. Diversification allowed Transber to grow in 2022 by 10%, and Berckemeyer sees the future with optimism: "Since the US began to evaluate alternatives to reduce its dependence on Asia, they found in Peru a good partner in different industries, an opportunity that we should not miss."

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"Establishing adequate asset management allows companies to include a comprehensive approach to their asset's maintenance to ensure their expected availability and reliability with controlled risk."

Wilson Miranda,
General Manager,
Confipetrol Andina



"Highly qualified human resources and innovative equipment, supported by a robust quality management system, are pillars that allowed us to respond adequately to the industry's demands and challenges and to achieve our customer's trust."

Erika Gabriel, General Manager, Bizalab



Another company that transports heavy cargo for mining companies and providers is Acoinsa. As with Transber, 2022 was a year of growth and diversification in which Acoinsa continued working with Peru's most important mining operations and developing solutions related to the maintenance area within the mine, where it expects to continue growing. "As the mine's production increases so does its inputs, which generates movement in both general and special cargoes," stated Aurelio Palacios, general manager of the company.

Acoinsa, like many other players in the mining value chain, is committed to the decarbonization objectives set by the Paris Agreements. In this regard, it has a policy of renewing its fleet with lower-emissions engines, and is thus monitoring the developments in EVs. "The technology is still under development, and there is not yet an electric solution capable of completely replacing diesel, especially in road freight transport. However, we see that the future lies in transportation equipment's electrification," concluded Palacios.

Despite their potential in this field, drones are often not immediately associated with logistics. Volatus Aerospace, a provider of integrated drone solutions throughout North America and growing into Latin America, has utilized drones to address logistics challenges in the ongoing conflict between Russia and Ukraine. This has accelerated innovation to meet the demand of complex conditions that can be extrapolated to other industries, such as mining. Unlike satellite imagery, drones can capture images below the clouds. They provide real-time information, while satellites require more time to process the data. According to Luis Fontenoy, director of Volatus LATAM, the use of drones in the mining industry is increasing rapidly, and they have various purposes, such as mine planning or underground operations. "We worked with a mining company to monitor the movements around its perimeter to implement security measures preemptively," added Volatus LATAM's CEO Bruno Leoni.

Third party services

Mining companies must optimize their human resources and outsource other activities to specialized third-party providers to excel in large-scale operations. One area that is commonly outsourced is the maintenance of industrial plants and fleets so mining operators can focus on their core business of mineral production. A large player in this segment is Confipetrol Andina, that established itself as a leading service provider to major mining companies such as Minera Aurífera Retamas (Marsa), Southern Peru, Yanacocha, Las

Bambas, Antapaccay, Hudbay, and Minsur. In recent months, the company has been able to provide its services at new projects that have been developed in recent months in Peru and are currently in their opex phase, such as Quellaveco and Marcobre, in which it executed several operation and maintenance services. Confipetrol's performance in these projects has also helped it acquire new clients like Raura and Minera Poderosa. "The demand for plant maintenance services in the mining industry has been on the rise, with a particular focus on concentrators, processing plants, and equipment for underground mines. Surface equipment for open-pit mining has also been a key area for maintenance," explained Wilson Miranda, Confipetrol's general manager. ■

GLOBAL BUSINESS REPORTS

Peru Mining 2023

Pre-Release Edition II

This publication is a pre-release edition of GBR's full series of reports on Peru Mining, that will be published in Q3 2023.

If you wish to be interviewed for the report, please contact
Lucrezia Falcidia (lfalcidia@gbreports.com)

www.gbreports.com

Senior Project Director: Lucrezia Falcidia
Business Analysts: Braulio Tresguerres and Natalia Preciado

Executive Editor: Mungo Smith
Graphic Design: Özgür Ergüney & Kaori Asato
Operations Director: Miguel Pérez-Solero
General Manager: Alfonso Tejerina

Cover photo: Courtesy of Las Bambas (MMG)