

GLOBAL BUSINESS REPORTS

PERU MINING 2025



PDAC Pre-Release Edition



A new mood in Peru's mining sector

The fact that GBR has been producing this report on the Peruvian mining industry for so long —16 years, in fact— has forged a strong sense of familiarity with many of the sector's leading companies and their executives. It is pretty common for meetings to start with a casual "So, how's 2025 treating you so far?" This year, and unlike the previous two years, their response was generally both surprising and refreshing: "Busy as ever."

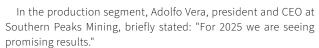
Over the past two years, different events have impacted the industry's performance (political instability, widespread social unrest, etc.), however, this year, what used to be slow summer months in Lima have become bustling weeks of activity, so that 2025 has kicked off with a lot of energy. "2025 has started with more momentum than in previous years, with a noticeable increase in work in Peru and abroad. In the last quarter of 2024, our engineering division saw a strong surge in industry demand—almost like a wake-up call—driving the need to meet tighter deadlines and expand services. It took a considerable effort on our part. Still, we succeeded and tackled it with dedication and commitment," commented Guillermo Barreda, general manager for Peru at the consultancy and engineering firm Knight Piésold.

Further down the value chain, Kai Rothgiesser, general manager for Peru at Bosch Rexroth, shared: "Although 2024 started off slowly, the second half saw a surge in activity that has carried into 2025. The mining sector regained momentum, and operations are running more smoothly, without major conflicts disrupting production or logistics."

"Peru has rich natural resources, but it is important to improve geographical studies. Not only private companies, but institutions and the government should also invest more to produce

accurate information that will attract investors."

Ivo Zhao, General Manager -Americas, MMG - Las Bambas



Without quoting all 50 C-level executives interviewed for this report at the start of 2025, suffice to say that GBR met with more optimism and a much better mood this year than we encountered in our past two editions. This was, indeed, refreshing.

But what is driving this optimistic outlook? This year, commodity prices, especially for copper and gold, have taken center stage in our conversations. Another key theme among all interviewees was the upcoming presidential elections in 2026 and the current sense of political stability that most believe the country is experiencing: "The election of Pedro Castillo made the industry nervous and prompted us to consider becoming less dependent on Peru. In the end, however, Peru has remained stable," commented Carlos Dellepiane, general manager of TUMI Raise Boring.

That said, it can be challenging to understand precisely what Peruvian executives mean by stability. From a macro perspective, it is hard to argue that Peru has experienced much of it. Since the 2022 elections, the country has seen four ministers of mines, two premiers, and multiple ministers of economy—hardly a sign of stability. The only way stability can be perceived, in the broadest sense, is that Dina Boluarte will likely complete her presidential mandate, with the next elections set for April 2026. This would mark the end of a chapter that began in December 2022, marked by social unrest that took a toll on the industry.

More than two years later, Boluarte remains in office. But what has she done for the mining industry? Several initiatives have been advanced in the mining policy conversation. One of them is the *Ventanilla Única Digital* (one-stop-shop, or VUD). Since it was first unveiled in 2019, implementation of the VUD has been ongoing, with exploration permitting included in February 2024. The system promises integrated digitalization, thereby reducing form filling – both physical and digital – and bringing together permitting processes across government departments. Subsequent phases will incorporate mining exploitation activities and benefit concessions processes. Additionally, water permitting – previously a separate and sequential step – was integrated into the broader DIA licensing process in 2023, illustrating an avenue for efficiency savings in environmental permitting. However, the VUD is not expected to be fully implemented until July 2025.

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Another interesting and recent initiative was the establishment and address structural issues to better capitalize on international of a multisectoral committee in October 2024 to formulate the National Multisectoral Mining Policy for 2050 (PNMM 2050). The PNMM 2050 is a state policy with a long-term vision aimed at sustainability and competitiveness of mining.

The two initiatives mentioned above remain just that – initiatives - yet to be converted into concrete actions. However, one thing that must be acknowledged about Boluarte is that, at the very least, she has not directed negative messages about the industry to Peruvians, as Castillo did. "Mining remains a key driver of the national economy, creating jobs, infrastructure and promoting development across the country," stated Boluarte during her appearance at the XV Simposio held in May 2024 in Lima.

While it is often said that actions speak louder than words, Boluarte's words carry significant weight given the social context of Peru. "From a foreign investor's perspective, Peru currently stands out as one of the most solid and stable options in South America, which is surprising given its challenges. Political stability is a key factor. While the current government's management may not be the best, it has at least allowed for some progress, which could help build investor confidence. The current government must complete its term, and the upcoming elections must be transparent and democratic to strengthen Peru's image as a reliable destination for foreign capital," reflected Mendoza from Anddes.

"While there are modest advances in some major projects, such as Tía María and Zafranal, it is crucial to establish strong incentives

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conditions and attract more foreign investment," added Marcial García, partner at EY.

The reality is that both projects and several others in the identifying and addressing national priority issues related to the pipeline have been in development for a long time. Grupo México, the owner of Southern Peru, has increased Tía María's CapEx to US\$1.8 billion. Meanwhile, Zafranal (a joint venture between Teck and Mitsubishi) is progressing and, according to media reports, the newly appointed general manager, Gisella Lombardi, stated that detailed engineering is expected to be completed in the second

> In the meantime, those projects already in operation continued 'business as usual'—as Dan Etheredge, vice president and principal for Latin America at Klohn Crippen Berger (KCB), described: "We had a strange year in 2024. The dramatic drop in foreign direct investment (FDI) across Latin America over the last couple of years finally took its toll, which made it hard for KCB to grow at the rates we have been here in recent years. As a result, most of our projects in Peru this past year have been centered on active mines, which have less to worry about regarding attracting FDI or around social unrest and political problems."

> However, the real question lies in what will happen with the new projects that must eventually come online to replace the existing ones. After all, mines are not everlasting. Most interviewees were optimistic about Peru's future: "If the upcoming electoral campaign and elections do not negatively impact mining investment but, on the contrary, drive it to continue growing, we will see a wave of new mining projects that have been on hold for years. With their activation, the demand for environmental impact studies, baseline assessments, and other key analyses will increase," asserted Barreda from Knight Piésold.

> César Kahatt, senior vice president and regional mining practice leader for Marsh McLennan, acknowledged that elections tend to generate uncertainty in investments. However, he assured that greenfield projects would not be significantly affected: "They can take more than 10 years from exploration to production and are more likely to move forward regardless of the electoral context, as their execution horizon is much broader. Companies with projects where the feasibility study is already completed and are about to start construction or seek financing might choose to wait and see the outcome of the elections," he concluded.

A safe bet

In January, Barrick Gold halted operations at the Loulo-Gounkoto complex in Mali after the military seized three tons of gold and transferred it to the state-owned Banque Malienne de Solidarité in Bamako. Comparing Mali and Peru may not be fair; however, the incident raises the question of whether Peru's political climate factors into investment decisions for producers and junior miners. "Mining makes up a very large part of the country's GDP, which makes it a very stable industry politically. Compare that to other international jurisdictions; some come with huge political and security risks that make investment challenging. Even if your grades look fantastic, you might have your project taken away from you. That is not the case in Peru," commented Chris Buncic, president and CEO at Condor Resources.

Discussing the much anticipated "supercycle" versus the one in 2011. Marcial García of EY commented: "The circumstances are

somewhat different. Back then, prices were driven by global demand, mainly fueled by China's construction boom. Now, the energy transition is the key driver. This structural shift is significant, and in this context, countries like Peru and Chile have a historic opportunity if they can maintain an attractive environment for investment."

From Chancay to Shanghai

"Our goal is to become the Singapore of Latin America, ensuring that port cargo passes through here on its way to Asia," stated Raúl Pérez Reyes Espejo, Peru's Minister of Transport and Communications, referring to the recently inaugurated Chancay Port.

Built by China, the port is set to become South America's largest commercial hub. After eight years of construction, the first phase of this mega-port has been completed. It is owned by a joint venture between Cosco Shipping, a Chinese stateowned company (60%), and Volcan, a Peruvian zinc and lead producer (40%) Inaugurated in November 2024 by Peru's President Dina Boluarte alongside China's Xi Jinping, the port 70 km north of Lima has become a flagship project under China's Belt and Road Initiative. For Peru, it represents a significant trade opportunity, aiming to capture a share of the US\$580 billion in annual commerce between China and South America.

GBR spoke with Carlos Tejada, deputy general manager at Cosco Shipping (Puerto de Chancay), who detailed the port's four-phase development plan, with a total investment of US\$4 billion: "In this first phase, we have already invested US\$1.3 billion, which includes the construction of four docks totaling 1,500 linear m, with two dedicated to general cargo and bulk shipments. Additionally, there is an 860-m berthing front for container ships," he explained.

Much hype surrounds the port's impact on the mining industry. Due to Chancay's location in an archaeologically significant area, Tejada noted that it currently handles general cargo and containerized minerals but lacks permits for bulk mineral exports. Whether bulk minerals will be included in future phases depends on market demand. "We have exported silver concentrates to other countries, but it is still uncertain whether bulk mineral handling will be incorporated. This will depend on market evolution and demand." he said.



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As you will read in the following pages, costs remain a key concern for many, especially producers. The new port is expected to shorten transit times to and from Asia, reducing shipping duration from 45 to 23 days, according to Tejada. The question is whether this reduction will impact costs. "Optimizing the entire value chain is crucial. The Port of Chancay should significantly lower the cost of imported goods from China. The delivery time for key supplies, such as grinding balls and tires, could be cut in half, reducing both logistical and storage expenses. This would allow companies to avoid maintaining large and costly inventories," commented Pamela Florian, country manager for Peru at Hatch.

However, opinions are mixed. Adolfo Vera, president and CEO of Southern Peaks Mining, acknowledged that shorter voyages might slightly influence prices, but he expects it to be a gradual and moderate impact: "The stabilization of urea prices or potential pressure on OPEC to increase oil production could have a greater influence on costs," he noted.

Roxana Burgos, general manager at Movitécnica, a conveyor belt company, remains skeptical of Chancay's short-term economic benefits. "We primarily import from Asia and assemble our products in Peru. However, we do not foresee Chancay making a difference in the short term. We still operate through Callao, as Chancay is not yet fully operational. Additionally, inland transportation costs remain high due to the lack of alternative roads connecting the Chancay port to Lima," she explained.

Sino-Peruvian ties run deep. Peru was the first Latin American country to establish diplomatic relations with China in 1874, and relations continue strengthening. Both nations are members of the Asia-Pacific Economic Cooperation (APEC) and signed a Free Trade Agreement in 2009. But perhaps more importantly, China remains Peru's largest investor in the mining sector.

As of March 2024, Chinese companies accounted for 20.8% of Peru's mining investment portfolio, totaling US\$11.37 billion across seven projects, including Chinalco, Las Bambas and La Arena, following Zijin Mining's acquisition of Pan American Silver's asset. As the push for "mined in America" policies grows, China is steadily expanding its influence in South America—particularly in Peru and Chile—where raw copper exports to Asia have risen.

"Delayed projects may progress if elections spur rather than hinder mining investment, eventually increasing demand for impact assessments and baseline studies."

Guillermo Barreda, General Manager, Knight Piésold Peru

"Rising commodity prices give new life to projects, but do not necessarily improve margins for service providers. However, more projects benefit us by creating economies of scale, securing contracts

Eduardo Cossio Chirinos, CEO, INCIMMET

and optimizing portfolios."

"Mining clients seek a provider that solves problems, not just one that executes projects. They need projects delivered on time, with quality, safety, and transparency."

María de los Ángeles Milicic, General Manager, Milicic

"During cycles when metal prices are high, it is not the mining companies which typically have liquidity—that need financing the most, but rather their suppliers."

Fernando Kaelin, Corporate Banking Manager, Banco Santander

"Rising mineral prices push companies to act fast and maximize profits before the market shifts, driving demand for expansion and optimization studies."

Christian Osorio, General Manager, **IMSS**

















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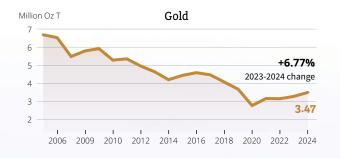
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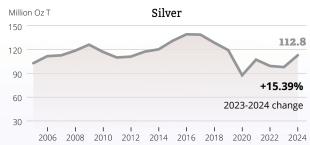
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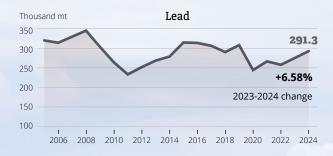
Peru, A Diversified Minerals Producer

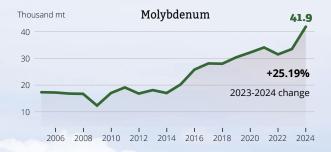






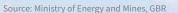














Appetite for growth

Comparing Peru's year-over-year copper production between 2024 and 2023, overall national production observed a slight decline, falling 0.73% to 2.73 million t/y, down from 2.75 million t/y in 2023. As such, Peru plainly failed to meet SNMPE expectations of a 4% role in Peru's growth." rise in copper production. Meanwhile, the United States Geological Survey (USGS) estimates that the Democratic Republic of Congo's production exceeded 3.3 million t/y in 2024. Once again, the Central African country has overtaken Peru for second place in global copper production. With projections now suggesting that Peruvian copper production may continue on this plateau through 2025, hopes to recover that symbolic position rest with new projects in Peru's pipeline – the likes of Zafranal, Tía María – and upcoming expansions

In the meantime, however, the list of Peru's top 10 copper producers has remained mostly unchanged. Cerro Verde, despite its 3.7% drop in production (449,096 t/y compared to 466,463 t/y produced in 2023) retained the top spot as Peru's leading copper producer. Meanwhile, Antamina remained the country's second largest copper producer, recording a smaller decline of 0.3%, from 435,378 t/y to 434,238 t/y. Both Cerro Verde and Antamina had extensions given the green light in 2024, growing their production rates and lengthening their mine lifespan.

In third place, Southern Peru recorded an 11% increase in production from 374,149 t/y to 415,258 t/y, which makes it the fastest-growing of Peru's top 10 copper producers over the last year. With production now projected to begin at the company's Tía María project in 2027, and an expected production rate of 120,000 t/y, Brocal saw drops of 1.5% and 2.5% respectively. Southern may well climb this list, depending on progress at Cerro Verde and Antamina.

In fourth and fifth place, Las Bambas (4th) and Anglo American's Quellaveco (5th) traded places as compared to the previous year - the only movement in this list. While Las Bambas saw a 6.4% production growth, from 302,039 t/y to 321,425 t/y, Quellaveco's declined by 4% to 306,299 t/y; starkly, if understandably, contrasting the 216.9% growth it saw in 2022-2023 as its operations ramped up to full-scale production.

Las Bambas celebrated a double anniversary in 2024: 20 years of operations, with the last 10 under MMG's stewardship. Reflecting on the mine's significance for Peru—and vice versa—Jing Zhao (Ivo), appointed in 2024 as executive general manager - Americas, at Las Bambas' operator, MMG, said: "Over the years, we have contributed more than S/2.3 billion in royalties and over S/470 million in mining

taxes, helping to position Apurimac among the fastest-growing regions in our country. We hope that Las Bambas will continue to be the economic engine that has played—and continues to play—a key

Operations at Las Bambas have frequently made headlines due to the mine's complex relationship with local communities. "Las Bambas has faced over 700 days of blockades throughout its history, which at critical moments affected our production capacity," Zhao commented.

Recently, Las Bambas has been stable, allowing it to achieve the mentioned copper production results. Looking ahead to 2025 and 2026, the company aims to increase production further after securing the fourth modification of its Environmental Impact Assessment (MEIA-d) for the subsequent phases at Ferrobamba, the open-pit currently in its fifth exploitation phase. MMG plans to reach phase eight by 2027. Additionally, construction at Chalcobamba is 60% complete, and the company aims to begin mining at Sulfobamba by 2030—both of which are satellite pits. "By 2026, we expect to maintain a production level between 360,000 and 400,000 t/v. Reaching 400,000 t/v would position us among the top 10 copper producers globally. Las Bambas is already a key player in the industry, but we are still a young company with much more to develop," Zhao remarked.

Moving further down the list of Peru's largest copper producers, Chinalco, placed sixth, was the last of the top 10 to have recorded a production boost, growing 3% to 206,392 t/y, as compared to 200,317 t/y the previous year. Antapaccay (7th) and Marcobre (8th) recorded declines exceeding 15%, while Hudbay (9th) and Sociedad Mineral El

"Condestable is running smoothly. We are accessing areas with ore grade improvements of

8% to 10%, and plan to take advantage of added plant capacity to increase processing by 10% without additional permits."

Adolfo Vera. President and CEO, Southern Peaks Mining



Notably, Teck Resources expects its Zafranal project, awaiting its construction permit in Q1 2025, to average 128,000 t/y in its first five years of production, from when it begins in 2029. At current production rates, that would place the project at 8th place on this list.

Large and medium-sized companies operating in Peru also have operations overseas, raising the question of whether Peru will remain as important as before in their growth portfolios. While Zhao, like many of his peers, acknowledges that high copper prices are not the ideal time to acquire new mines, the three copper producers interviewed for this pre-release have expressed interest in pursuing new opportunities, particularly in Peru.

In the case of Hudbay Minerals, a mid-sized producer, the company's portfolio spans Canada, US and Peru, where it operates the Constancia mine and its satellite pit, Pampacancha. Javier del Río, senior US business unit vice president, commented that Hudbay plans to move forward with the feasibility study for Copper World in Arizona this year (2025). The new project, expected to add around 85,000 t/y of "made in America" copper, could be ready by mid-2026 to begin construction. "This would position Copper World as the third or fourth largest copper mine in the US by production. It is also worth noting the low capital intensity of its first phase, with an investment of approximately US\$16,000 per t/y, making it highly competitive compared to other projects," he added.

But how important is Peru to Hudbay now? "Peru is fundamental, not only because of its geological richness but also because we already have a highly skilled team there. The country has not lost its strategic importance for Hudbay. On the contrary, as we grow,





"We hold over 100,000 hectares within our concessions and operate two active mines. Our

focus is on continuing precious metal production and acquiring new assets."

Graham Speirs, General Manager, Sierra Sun Group



more opportunities are opening up, including the possibility of participating in due diligence processes to identify new, larger-scale operations," he said.

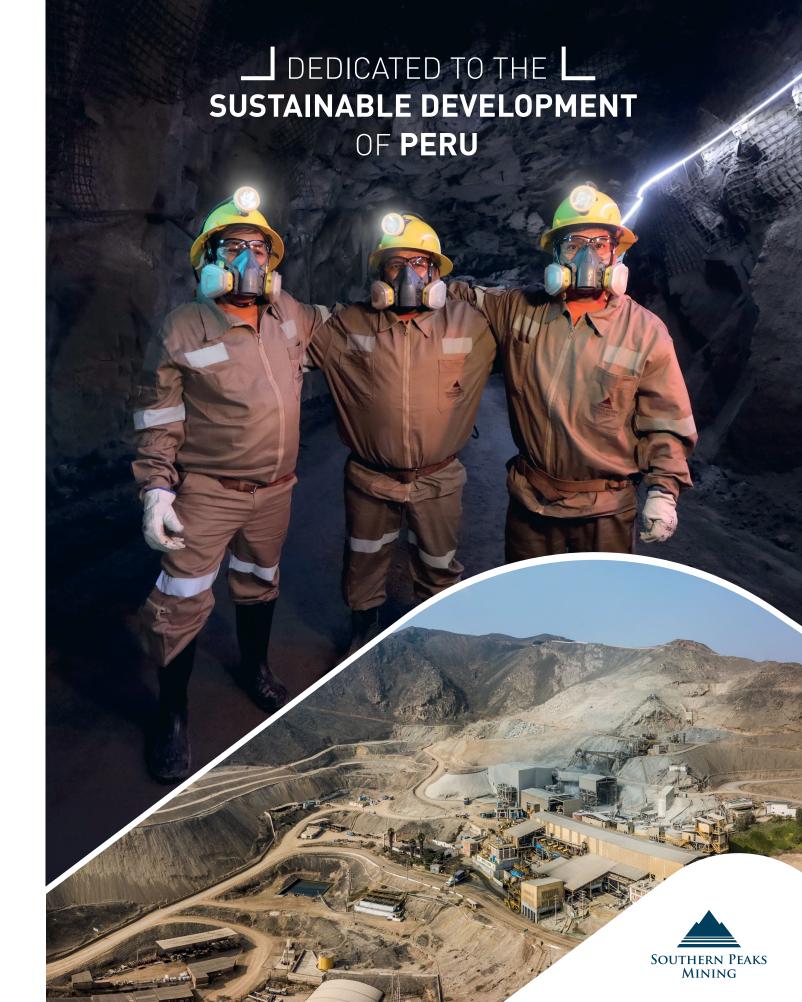
Hudbay already has two projects in the pipeline (María Reyna and Caballito) and is exploring opportunities in the Eocene-Oligocene Andahuaylas-Yauri belt, home to mines like Las Bambas, Antapaccay (Constancia, of course) as well as promising projects such as Haquira from First Quantum Minerals. Del Río believes that having existing infrastructure in the region gives Hudbay a strategic advantage: "Having a processing plant already in place gives us a significant edge, as infrastructure costs are sunk costs. We would only need to cover additional operational expenses for any new project. This makes us optimistic about the potential for new discoveries in the region," he concluded.

Southern Peaks Mining (SPM), a solely Peru-focused producer, has not ruled out expanding by acquiring new projects. This year, Adolfo Vera, president and CEO, mentioned that while inorganic growth remains an option—particularly in southern Peru—the process is lengthy and requires caution. "Negotiations are complex, but we are in no rush. We prefer to move forward with well-considered decisions to avoid mistakes and ensure long-term success," commented Vera.

For now, the mid-sized underground producer will focus on ramping up production at its Condestable mine, where in 2024 it processed approximately 3 million t of ore and produced 95,000 t of copper concentrate, equivalent to 24,000 t of copper.

Over the past year, SPM has fine-tuned its operations to take advantage of favorable commodity prices and the flexibility provided by Resolution No. 125-2024-MINEM/DM, which allows Peruvian producers to increase output by up to 10% of existing capacity. "This year, we are seeing promising results. Condestable is running smoothly. We are accessing areas with ore grade improvements of 8% to 10%, exceeding expectations. While more production requires more preparation, we achieved a 7% volume increase in January. With these advancements and stable prices, we expect an even better 2025," Vera explained.

One common theme among producers is their cautious approach, even amid strong price performance. For example, Zhao from Las Bambas noted that while many miners face declining ore grades, permitting complexities add significant weight to OpEx: "We deal with permitting challenges in every country, as well as environmental and social investment standards that impact OpEx. Being aligned with the ICMM means we comply with local regulations and international standards, which increases our operating costs," he commented.



"From a geological perspective, Peru is an incredibly attractive region, and we believe we should grow organically by seizing opportunities around Constancia."

Iavier del Río. Senior VP US Business Unit. **Hudbay Minerals**



Vera echoed this sentiment, adding that SPM is investing in Al for flotation, exploration, and metallurgical innovation: "Given the permitting challenges, we need to optimize recoveries and manage low-grade deposits to produce more copper with existing resources. We aim to increase copper recovery from 91% to 95% and gold recovery from 80% to 90% to drive organic growth."

Precious metals

metals saw strong growth. Overall production of gold in Peru grew 6.77% to a total of 3.8 million oz in 2024, up from 3.5 million oz in 2023. Meanwhile, gold prices continued to climb to new heights, reaching an all-time peak of US\$2,957.97/oz on 20 February 2025.

Peru's leading gold producer, Newmont's Minera Yanacocha saw another year of strong growth. Having expanded its production by 13.1% in 2023, through 2024 it grew even more rapidly, recording a 28.6% increase in gold produced – reaching 388,871 oz/y, up from 302,462 oz/y.

leaching technology, which has become the company's primary production mechanism. The program began as a pilot two years ago and entered commercial production in March 2023. It allows for the recovery of metals from closed leach pads, maximizing resource utilization. "Yanacocha has been evaluating this project for a long time to fully leverage the resources in its pads. [...] It is now operational and delivering tangible benefits, contributing to the recent increase in gold production in Peru," commented Guillermo Barreda, general manager at Knight Piésold, an engineering firm that worked on the project.

Newmont's growth opened a more substantial gap to the second-placed gold producer, Minera Poderosa. Expanding production at a rate of 8.5%, Poderosa's output totaled 320,887 oz of gold in 2024, versus its previous year's 295,700 oz. Importantly, Poderosa faced attacks from illegal mining groups at its operations

A rapid growth rate of 33.3%, following up on its 68.7% expansion in 2023 saw Minera Boroo Misquichilca climb further up the table, from fifth to third; with a total production of 256,822 oz/y, compared to 192,712 oz the previous year. It thus surpassed Consorcio Minero Horizonte and Minera Aurifera Retamas, both of which saw production declines.

Boroo Misquichilca, the subsidiary of Singapore-based Boroo, is owner of the Lagunas Norte mine in La Libertad. This mine was operated by Barrick until 2021 when it was sold to Boroo. Although

it was placed on care and maintenance in 2019 and its closure was anticipated by 2024, the company announced in January 2025 the completion of a PFS for the CMOP Expansion (Carbonaceous Material Optimization Project, formerly known as PMR). The study includes updated mineral resource and reserve estimates, extending the LOM to 12 years.

Another notable development comes from Buenaventura, which recently announced the start of operations at its San Gabriel greenfield project in Moguegua by mid-2025. The project is expected to produce between 200,000 and 250,000 oz/v of gold and has already incurred a capital expenditure of nearly US\$140 million.

PPX Mining is another company making strides, having begun construction of its own plant for the Callanquitas/Igor silver and gold mine in La Libertad. According to interim CEO, John Thomas, the mine has been operating for nearly six years. The ore was previously sent to a facility near the Ecuadorian border, incurring additional costs. "That made it clear we needed to build our own plant, which is now under construction. We have secured all the permits, signed the contract, and already paid for half of the major equipment. Earthworks at the site began in February, and the plant, designed to process 350 t/d, will treat both oxide and sulfide ore. We plan to produce a high-grade silver-gold concentrate and Contrasting copper's slight decline, Peru's production of precious bullion, with the goal of having the plant operational by October,"

> Meanwhile, over the course of 2024, silver's spot price rose from US\$23.56/oz to US\$28.90/oz. Like gold, silver is often bought to act as a store of value and hedge against inflation. However, like copper, silver is also expected to face supply shortages and high demand as another key metal for the energy transition.

In Peru, silver saw an even steeper ramp up in production than gold, growing 15.4% – an increase from 107 million oz/y in 2023 to 123 million oz/y in 2024. That includes some especially notable Newmont has focused on the implementation of injection rises: chief among them, Buenaventura, jumping from ninth place to first among Peru's top 10 producers, with a 264.8% increase in silver production from 3,751,562 oz/y to 13,684,462 oz/y. That leap in production came with the initiation of full-scale production at Yumpag and Uchucchacua, operational only since Q4 2023.

> Pushed into second place by Buenaventura, and with a slight decline in production of 6%, from 13,800,232 oz/y to 12,978,313 oz/v, was Antamina; while the rest of the top 10 saw some movement as companies including Chinalco (3rd), Volcan (4th), Minera Ares (5th) and Southern (6th) recorded a mixture of increases and drops in output.

Peru's base metals output presented a mixed picture in 2024. Zinc saw an overall production drop of 13.5%, falling from 1,469,127 t/y in 2023 to 1,270,646 t/y in 2024. Most significantly, Antamina, which in La Libertad through 2024, stunting its ability to increase in 2023 contributed 36% of the country's zinc production, reduced its output by nearly 40%, dropping from 527,979 t/y to 319,069 t/y. It nevertheless remained the leading producer, though now with a reduced share of 25.1%. Volcan - with a 4.7% decline to 163,046 t/y - and Nexa - growing 10.1% to 93,247 t/y - maintained their second and third places, respectively. Rising to fourth place, with a notable 60.6% jump, was Minera Shouxin, growing its output from its tailings processing project at the Marcona mine.

> Across other base metals, lead saw a 6.6% increase in national production, rising to 291,319 t/y; molybdenum grew 25.3% to 41,942 t/y produced; and tin rose 23.2% to 32,317 t/y. ■



"Where would you be without us?"

Exploration is critical to the mining ecosystem. With demand for critical minerals projected to grow explosively as global energy use shifts towards electricity and renewables, currently operating mines the extraction of more of the "red metal" between now and 2050 than throughout the entirety of human history, per research from the International Energy Forum (IEF). That necessitates the discovery explore untouched ground.

Despite that arguably existential task, in 2024 greenfield exploration budgets fell 8% to an all-time low share of total nonferrous exploration expenditure, continuing their downward trend since 2001. S&P reports that market conditions and an risk aversion have pushed budgets towards expanding pre-existing resources, where infrastructure and copper, molybdenum and silver were also confirmed. Consequently, prior study make for low-cost, if lower return, options. For juniors, as the project moves towards a PEA and PFS, it presents a wellthough, contributing 47% of greenfield and 70% of late-stage exploration globally, those lower-risk options often simply do not exist - leaving them more exposed to negative markets and limited liquidity.

Providing some optimism, the latest figures from MINEM said Gendall. indicate growth in overall exploration investment. In 2024, Peruvian exploration budgets jumped by over 28% year-over-year - totaling US\$568 million, versus US\$443 million in 2023. That makes 2024's exploration investment the highest since 2014. With just 0.3% of in a decade, and a metals market predicted to grow rapidly, the major gold companies." question is: can a rising tide float all boats?

Chris Buncic, president and CEO of Condor Resources, a junior company with 20 years' experience discovering and developing a polymetallic portfolio of mine prospects in Peru, explained: "Majors are not allocating many resources to greenfield exploration, so junior exploration is critical."

Condor, in transition from a project generator to traditional explorer model, has diversified its income across shareholder investments, joint venture and option agreements, and sales from its portfolio. Still, Buncic recognized that Condor ultimately relies on advancing its projects to sustain the company - in other words, spending money to make money. At the company's flagship Pucamayo project, an epithermal gold target in Ica, a DIA permit to start on a second phase of drilling has been a frustratingly long process for Buncic. "There needs to be a concerted effort to help companies that lack the resources of the largest players," he argued – for the long-term benefit of the sector at large.

Ian Gendall, president and CEO of DLP Resources, also recognized the indispensable role juniors have played in exploration: "In the past decade, only about 4 million t of new copper supply have been clearly lack the necessary supply. Copper demand is set to require added through discoveries," he explained, adding: "Juniors, however, have been doing most of the exploration work, and majors are relying on us to help fill their supply gaps."

DLP's Aurora project, sitting in the underexplored Miocene subof new resources – moving beyond existing or brownfield sites to Andean belt, has shown high-grade results in its large porphyry system - up to 0.6-0.8% copper equivalent for 200-300 m, alongside 0.1% to 0.3% molybdenum. Gendall said this puts Aurora among the highest-grade known molybdenum deposits on Earth – highlighting that this is an especially unusual trait for a South American asset. In further metallurgical studies, high recovery rates of 86-96% for developed and highly valuable asset for senior miners: "We believe Aurora is an interesting opportunity for major players, potentially bridging the gap between exploration and large-scale development,"

Meanwhile, highlighting the senior acquisition potential of Forte Minerals' most recent development asset, Patrick Elliott, president and CEO, commented on the Alto Ruri gold project: "Prospects like this are incredibly hard to find. It is the type of Peru's territory being explored, the highest exploration investment property juniors look for to build into eventual takeovers by

> Discussing Forte's value-generating methodology, Elliott explained that downturns for the mining industry cause major companies to reduce expenditure, relinquishing exploration assets

"In the past decade, only about 4 million tons of new copper supply have been added through discoveries.

Juniors, however, have been doing most of the exploration work, and majors are relying on us to help fill their supply gaps."

Ian Gendall, President and CEO. **DLP Resources**



"Large companies focus on optimizing production, or expanding brownfield exploration around their existing operations, so earlystage exploration is limited."

In building its pipeline of projects, Elliott explained, Forte takes stretch to over 100 years. advantage of this by picking up promising assets during those slow periods, when prices are low. For Elliott, all of this is a game of great patience: "Assembling assets like ours and advancing them to this status takes an entire mining cycle to execute," he said.

It is through this methodology that the company has brought its copper-gold portfolio across Peru, including Miscanthus, Pucarini and Esperanza, to "drill-ready," DIA-approved status - the type of projects that mid-tier and major companies may look to acquire as demand continues to rise.

nearly two-decades in mining and precious metals mergers and acquisitions (M&A), Dan Symons was still struck by the extent of activity on his arrival to the copper market as president and CEO of C3 Metals: "The world's biggest copper producers are doing due diligence all the way down to early-stage explorers, examining M&A and joint venture opportunities," he explained.

Senior mining companies, Symons suggested, are looking beyond developing companies with known deposits, into higher-risk, earlierstage prospects, seeking to fill their pipelines with copper prospects in anticipation of future demand. He said: "Majors are looking more more M&A over the coming years."

Across its two Peruvian portfolio projects, Jasperoide and Khaleesi, a pair of porphyry-skarn copper-gold projects in Cusco, and two in Jamaica, Symons explained that C3's approach is to test and develop 'low-hanging fruit,' geologically speaking. Then, when projects reach higher levels of capital intensity or technical complexity, the company seeks to move forward with partnerships or divestments.

Chasing porphyries - Golden opportunity?

Over 60% of the world's copper production arises from operations focused on porphyry systems. Typically enormous in size, porphyries can offer vast quantities of copper, as well as valuable secondary

quickly and refocusing on low-risk targets. In such periods, he said: commodities such as gold, silver and molybdenum. It is not uncommon for such systems to exceed one billion tons of ore. That scale offers certain key advantages: economies of scale can afford low operating costs per unit of production, and mine lifecycles can

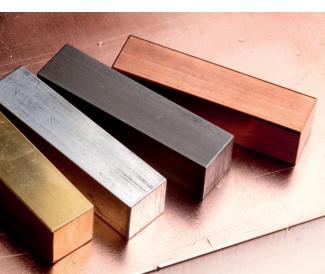
Peru's copper mining industry, like that of the world at large, primarily centers itself on porphyries. That includes several of the country's largest projects – the likes of Cerro Verde, Las Bambas and Toquepala - which find themselves among the world's topproducing copper mines. Across Miocene, Eocene-Oligocene and Paleocene belts, Peru's known porphyry network stretches along its full length, north to south. Alongside other mineralization systems, like sediment-hosted and skarn deposits, Peru's copper reserves combine to 12% of the global total – surpassed only by neighboring It appears, too, that demand is indeed returning: even with his Chile, the geology of which is also dominated by porphyries.

> Camino Corporation's portfolio includes two copper porphyry projects, newly-acquired Puquios in Chile and Maria Cecilia in Peru, and its Los Chapitos iron oxide copper-gold (IOCG) project, also in Peru. President and CEO, Jay Chmelauskas, told GBR that the company is seeking to take advantage of a copper market with a projected upward trajectory by advancing as fast as possible to production: "The average time to build a mine is around 17 years – at Puquios, we are looking to build a copper-producing business in

Puquios is "shovel ready," with a new PFS expected in Q1 2025. "It long-term, with higher potential for discovery. I think we will only see is a good-size mine for us to start our production profile," reckoned Chmelauskas.

> Camino's 50% joint venture partner, Nittetsu Mining, will take charge of the construction and operation of the mine. The project's timing, Chmelauskas stressed, is critical: "With copper prices on the way up, the market is placing high value on developers and producers, so production is our main focus for 2025."

> Element 29 Resources is also placing its sights firmly on copper. At its flagship project, Elida, a Phase-III drill program has infilled existing resources, improved grades (up to 0.56 g/t copper, 0.4 g/t molybdenum, and 3.49 g/t silver), and moved beyond previous pit-constrained estimates for its porphyry system. For CEO Richard Osmond, a lack of gold in Elida's mineralization is a major advantage



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- Metallurgical study completed
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- No significant deleterious elements
- 28.7% Cu concentrate & 49.7% Mo concentrate
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for the project: "Gold in porphyries tends to imply higher arsenic content, which makes recovering copper more challenging and expensive," he explained.

Elida enjoys excellent access to infrastructure, including the new Chancay mega-port. Osmond was effusive about Peru's copper potential, citing the country's trade agreements with the US and Canada, the robustness of its wider mining industry, and the unexplored opportunities in the country as key pull factors for explorers: "Companies go around the world looking for big porphyry copper projects, but they always come back to places like Peru."

Yet, while porphyry systems' scale offers opportunity, it also presents difficulties for exploration and development. Establishing their size and mineralization is time consuming and costly, needing large-scale mapping, sampling and drilling, and augmenting permitting and social access requirements - often stretching exploration timelines to over a decade. For Ian Gendall, president and CEO of DLP Resources, the impressive size of the Aurora project's copper-molybdenum porphyry project illustrates these hurdles, as well as opportunities for partnership as the project moves ahead: "Aurora's scale demands significant financing, which can be challenging for a junior company. Raising US\$30-40 million introduces substantial dilution, making strategic partnerships crucial," he said.

Meanwhile, in a commodity market seeing volatile copper prices, gold has trended upwards to new all-time highs. Some juniors, therefore, may be drawn towards precious metal exploration, where scales are smaller and timelines shorter. For Andrew Thomson,

"Companies go around the world looking for big porphyry copper projects, but they always come back to places like Peru."

Richard Osmond, CEO, Element 29 Resources



president and CEO of Palamina, an explorer focused on developing a portfolio of gold projects in the lesser-explored Puno Orogenic Gold Belt, the time-scale of porphyry copper exploration is simply too long: "There are many exploration companies out there chasing porphyry copper deposits that take decades to get to production,"

At Palamina's Usicayos gold project, scout drill programs have returned high-grade intercepts - up to 24 g/t gold over 0.5 m, and 0.75 g/t over 56 m. Thomson, naturally, was bullish on gold exploration: "With gold prices at all-time highs, majors are beginning to fund juniors with large-footprint early-stage projects."

He also predicted that the silver market, which he sees as undersupplied in the face of coming demand from the global push for electrification, is likely to rise alongside gold.

James Tworek, CEO of Element79 Gold, explained how the company is moving its Lucero project in Arequipa towards smalldevelopment opportunity. Describing Lucero's geological profile, Tworek shared: "Lucero is an exceptionally high-grade asset: past production rates of 150 t/d yielded between 20-40,000 oz/y gold equivalent – producing around 14 g/t gold, and 373 g/t silver."

Having previously focused its operations on projects in Nevada and Canada, Element 79's move to Peru in 2022 came as the company sought to create a revenue-generating mining business. In a strong contemporary gold market, dry-stacked tailings on the Lucero site, from historic production by former owner Buenaventura, also offer a possible avenue for production: "There are approximately 50,000 oz of recoverable gold equivalent sitting in these tailings piles, which stands as a solid source of potential revenue over the coming 15-20 years," Tworek explained, with the company planning to build a facility on site to process the piles in the near-term, pending resource holding across a newly uncovered Miocene porphyry belt in centralestimates and economic assessments.

Progress on permitting

Amongst its top-10 risks and opportunities for global miners in 2025, EY cited the lengthening of timelines caused by regulatory red tape as a key blockage in the pipeline of new projects, in which juniors play a critical role. Looking internationally, the Democratic Republic of Congo's (DRC) widely-reported reeling-in of Peru's long-held place as the world's number-two copper producer has been linked to Peru's more stringent and, ultimately, time-consuming permitting regime. As a comparison, the time for a project to advance from discovery to production in Peru at marginally below the global

scale gold production while continuing to explore its high-grade average of 23 years is around 50% longer than the DRC's 15 years. For junior miners, much of whose work, at the early stage of a project's life-cycle is fundamentally shaped by permitting processes, that difference could be critical to a choice between entering one jurisdiction or another.

> While acknowledging that Peru's permitting timelines have improved in recent times, Chris Buncic from Condor Resources said: "While thoroughness is greatly appreciated, when a 30-day timeline turns into months due to tangential follow-up questions, that is a

> Peru's government has been working in recent years to streamline permitting timelines, via a range of methods. Lars Dahlenborg, president of Hannan Metals, told GBR that he has observed tangible improvements in permitting speeds. At Valiente, a vast 1,100 km² eastern Peru, Hannan's dedicated team takes charge of navigating Peru's permitting system as the company prepares the project's maiden drill program, starting in May 2025. Comparing Hannan's recently-attained DIA at Valiente, which was granted in November 2024 after less than 12 months of processing, and its previous DIA for the San Martin project, which took nearly 15 months until its approval in January 2024, Dahlenborg said: "This improvement is huge, especially for a junior explorer, as it allows us to get to the site and start testing our ideas more quickly."

> Dan Symons from C3 Metals has seen a marked improvement too. Describing a pendulum-like swing between bureaucracy and cutting back red tape for Peru's mining regulations, he said: "The



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pendulum has been swinging back the right way – I commend everything the Peruvian government has been doing to make that

Across C3's two Peruvian projects, he observed: "The permitting process for Khaleesi, where we hope a DIA will be in place by H2 2025, is moving tremendously faster than for Jasperoide just a few years ago."

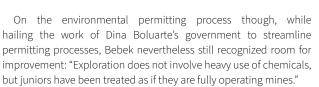
Of course, none of this is to diminish the importance of the rigorous social and environmental standards that Peru's permitting regime upholds. Trusting and co-beneficial relationships with local communities sit at the heart of the mining industry's success, and care for the natural environment on and around mine sites is crucial to their sustainability. While, for example, DRC has accelerated its copper production at an astounding rate, reports suggest that this has come thanks to more lax environmental and social regulation. Jay Chmelauskas, president and CEO of Camino Corporation, said: "Although the DRC has come onto the map, Peru and Chile have a very large endowment, coupled with long histories and excellent cultures for mining. They engage in the best practices and have but juniors have been treated as if they are fully operating mines." done so consistently for decades."

At Coppernico Metals' Sombrero copper-gold skarn-porphyry project, Ivan Bebek, CEO, spoke to both sides of the argument. The project's social access agreement and drill permits took around nine years to realize, and involved extensive agricultural programs and job creation work. On the social side, Bebek was clear: "Building community relationships is something you cannot speed up, and it will pay dividends once we make our discovery."

"We have been operating in Peru for over a decade and have seen a lot of bureaucracy

removed. If things keep progressing, Peru could make that an attraction, distinct to other copper producing countries."

Ivan Bebek. CEO. Coppernico Metals



As such, Bebek was grateful for Coppernico's robust finances, having raised C\$19.4 million in a financing round in 2024 - including C\$8.8 million in backing from Teck Resources - meaning the company can weather the time necessary for permitting. Coppernico is advancing Sombrero's maiden drill program, yielding high-grade results including an intercept of 0.5% copper for 20 m. Bebek hopes to expand drilling at the project, growing to a larger area based on its highest-grade vectoring, and permitting for up to 200 drill pads by the end of 2025.





Engineering, Consultancies and Contractors

"Busy as always"

As in recent years, engineering and consultancies' revenue drivers have been brownfield projects and mine life extensions: "New mining projects, specifically greenfield projects, are somewhat Mendoza, general manager for Anddes Peru and Ecuador.

seize this window of opportunity to maximize output, especially true in Peru after the approval of Ministerial Resolution No. 125-2024-MINEM/ DM, which amended Article 3 of Supreme Decree No. 030-2016-EM, allowing mining companies to ramp up production by 10% within existing capacity without requiring additional permits. "When mineral prices rise, everyone rushes to take advantage of the peak in the cycle. The key is to act quickly and strategically to maximize profits before the market adjusts. This often means reevaluating processing rates and adjusting mining operations, which in turn drives demand for expansion and optimization studies—an area where we have seen significant growth," shared Christian Osorio, the general manager for Inti Mining Smart Solutions (IMSS).

Green, baby, green

It did not take long for European leaders like France's Emmanuel Macron or Spain's Pedro Sánchez to twist US President Donald Trump's catchy slogan "drill, baby, drill," into alternatives like "plug, baby, plug" or "green, baby, green." While Trump's phrase echoed a national energy emergency with the aim to liberalize and boost fossil fuels and power projects, others advocated for a shift toward alternative energy sources, such as hydrogen or nuclear.

"The current government has to complete its term, and the upcoming elections must be transparent and democratic to

strengthen Peru's image as a reliable destination for foreign capital."

Javier Mendoza, General Manager for Peru and Ecuador, Anddes



Caught in the middle of this debate is the mining industry. Once again, mining is at the forefront of this delicate tension between energy production and societal concerns. "The industry has seen of an outstanding issue in Peru. This is why, at present, our main protests about environmental contamination for decades, even projects are focused on sustaining existing ones," commented Javier where standards and results have improved. Climate change is a factor too. Across the length of the Andes, glaciers are melting – if a High prices immediately benefit producers, motivating them to mine is in their vicinity, the likelihood that it will be blamed for their disappearance is high," commented Dan Etheredge, vice president and principal for Latin America at Klohn Crippen Berger (KCB) who added that maintaining a good reputation is a constant challenge and that one misstep can overshadow years of hard work.



"The ESG agenda has become a cornerstone for

the mining industry and WSP. It is no longer an emerging issue but an essential requirement."

Gustavo Bravo, **Regional Director** for Mining, WSP



"We have seen cycles of large-scale contracts, then lulls in greenfield project development. Now, though, demand for copper is set to keep growing, and the price is likely to keep rising with

Steve Dixon, CEO. STRACON Group

"We are exploring using additives to neutralize chemicals in tailings and reduce environmental risks. Though costly, they are a critical investment

compared to the potential consequences of tailings failures, which could even lead to bankruptcy."

José Luis Lara, General Manager, Lara Consulting

Walsh's general manager, Gonzalo Morante, believes that new talent driving innovation and fresh approaches can help. To this end, the company has been undergoing a digitization process and integrating new talent with its experienced team: "This combination allows us to maintain a balance between price and quality. The new generations bring a fresh perspective and with training more focused on environmental issues. What was once considered normal is no longer acceptable, and this presents challenges, especially in older mines where operations from the 1970s cannot be expected to meet current standards," he explained.

general manager, Virgilio Gonzales, highlighted how ESG has evolved: The ESG agenda has become a cornerstone for the mining industry and WSP. It is no longer an emerging issue but an essential requirement, as reflected in studies on climate change, environmental

monitoring, governance of tailings dams, water stewardship, energy and social diligence studies."

To continue adding value, WSP wants to diversify and venture into the EPCM sector without neglecting its core business: mining consulting. In this specific segment, they highlight their program "Future Ready" as the heart of the company's sustainability and global growth strategy, challenging them to anticipate the future and identify new technologies, as highlighted by Gonzales, who added: "Although the initial investment may depend on commodity prices, in the long term, these initiatives lead to a reduction in operational costs. Additionally, technologies like High-Density Sludge (HDS), help enhance safety, efficiency, and project operability, strengthening our commitment to a sustainable and profitable approach," he concluded.

Carlos Barrientos, regional director for the Andean Region and Mexico at Séché Group, described how committing to those ESG principles up to the very end of the mining process can add further value to operations: "Waste segregation is a puzzle that requires careful assembly, but when done, it significantly impacts sustainability and operational efficiency. However, both suppliers and customers must be on the same page and see it as a long-term investment, not a cost," he underlined.

Prices up, costs...down?

"2024 witnessed significant strategic moves, with acquisitions and alliances that highlight the intensity of the race for copper. The red metal is essential for the energy and technological transition and has become a strategic resource," commented Pamela Florian, country

To meet demand, a key focus for engineering and consultancy firms is helping producers manage their OpEx. After all, high commodity prices are only rewarding when costs do not rise simultaneously. For Florian, Peru's copper industry is at a "turning point" where competition drives the need to boost productivity, improve efficiency, and reduce operational costs. "In a market where the 'big fishes' are eating the smaller ones, every mining unit must become more efficient and competitive. Reducing delivery times and optimizing the supply chain directly impacts operational costs and enables companies to be more agile and better respond to market

Angie Sakata, Peru's recently appointed country manager at Stantec, pointed out that existing projects face challenges such as declining ore grades, which make it difficult to maintain long-term profitability and sustainability: "This requires a strategic approach that allows companies to capitalize on high prices without compromising the viability of their projects."

For Lara Consulting, which specializes in designing, constructing, operating and closing tailings facilities, 2024 was an outstanding year according to its general manager, José Luis Lara: "We outperformed the sector, achieving a 30% growth."

The company is now planning to launch a laboratory in Peru that will analyze and replicate the conditions of mining operations to develop innovative technologies for storing tailings with reduced water usage and help with the costs of operations: "The idea is to create an experimental space that focuses on the real needs WSP's regional director for mining, Gustavo Bravo, and Peru's of operators, something that is often missing in more specialized labs. [...] We want this lab to also serve as a hub for research and innovation, allowing us to develop our talent by attracting local and international projects, and offering our clients safer and more costeffective tailings facilities," he concluded.



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There is room for everyone

The Peruvian contractor segment is served by a mix of local companies that have expanded and are seeking growth in other jurisdictions without neglecting Peru, while new international companies are also entering the market.

For STRACON Group, Peru accounts for 40% of the company's activities. According to Steve Dixon, STRACON Group's CEO, in Peru, there is still plenty of room for growth, especially in the copper space and with existing clients: "We have a very robust backlog, of around two and a half times our annual sales, and so we are focused on performing for those clients [...] Of course, we keep adding new clients too. In 2024, STRACON designed and built a water treatment plant at Cerro Corona for Gold Fields, and we have been working on Cerro Verde's new input crushing system. Those are new services with new clients, part of our growth and diversification."

Construplan has been working with Nexa Resources at the Atacocha and El Porvenir mines, which has allowed it to generate US\$90 million in revenue. Rafael Ríos. Construplan's country manager, explained that while social conflicts in Mexico tend to be union-related, in Peru, community-related challenges are more prevalent. To address this, Construplan adjusted its entry criteria to include more local talent and providing them with specialized technical training: "The challenge was not only technical but also strategic. We had to keep the corporate team calm amid an unprecedented situation—a project halted by community blockades. This scenario demanded creativity, patience, and extraordinary effort. Without a doubt, it was an experience that left us with valuable lessons, a sense of satisfaction, and two years of work in Cerro de Pasco, marked by a level of social peace that had not been seen in a long time," he continued.

According to Marian Milicic, general manager of Milicic, the Argentinian contractor focuses on medium-sized projects where it can add the most value, often by partnering with Peruvian players: "We are already exploring some joint ventures with Peruvian companies, both larger and smaller than us, to complement our capabilities. For example, we specialize in earthworks and civil construction, while other companies focus on structural assembly, allowing us to provide clients with a comprehensive solution. We have always had a collaborative approach, as it has been key to our growth in Argentina."

Underground contractors: Make do with less

As we get deeper into the value chain and it becomes more specialized, it is interesting to observe that while rising commodity prices increase the demand for studies from engineering and consultancy firms, the effect on more niche companies like underground contractors is less pronounced: "As a specialized company, we do not depend directly on commodity prices. For us, they are more of a reference point. Our focus has always been on delivering more value with the resources we have. Instead of solely focusing on price, we aim to do more with the same, or even less, ensuring that everything is done safely, with the highest quality possible," commented Guillermo San Miguel, AESA's CEO.

INCIMMET is another underground contractor whose CEO, Eduardo Cossio Chirinos, agreed: "Higher mineral prices have a positive impact, but it is marginal. A price increase can revive or boost the value of greenfield and brownfield projects, but that does not necessarily translate to better prices or margins for service providers [...] Selling more does not necessarily mean higher profitability [...] Managing more or larger projects can mean hiring more people, which brings the challenge of labor shortages. As a service provider, the real benefit comes from efficiency and maintaining a healthy project portfolio."

GEMIN Associates began as a consulting and engineering firm but identified a niche for growth as an underground contractor after working with Redpath on Newmont's Yanacocha Sulfuros project. According to Marco Zavala, the company's general manager, 2024 marked a turning point as GEMIN solidified its position in this segment through its work at Equinox Gold's Aurizona underground mine in Brazil. Throughout the year, the company focused on designing critical infrastructure, primarily ventilation and pumping systems. "This project strengthened our expertise in underground operations and built on our experience in Peru, where we have conducted inspections and designed vertical shaft extraction systems," Zavala explained.

Now, GEMIN is looking to expand further into Latin America, focusing on Costa Rica, where it has established a new office. "This location is a strategic hub for managing operations across Central America. Gradually, the international market is recognizing us for our expertise in underground mining," Zavala concluded.





All aboard to Arequipa

Across the broadest range of equipment, services, technologies and solutions on offer in Peru's mining sector, one word seems to define all: growth. Antonio Castillo, managing director of Peru's National Industrial Society (SNI), affirmed in February 2025 that within five years – as soon as 2030 – mining suppliers will grow to account for as much as 12% of Peru's national GDP, based on expected investments in the mining industry of around US\$52 billion. In early 2025, this sector's contribution was estimated to account for just 3.5-3.8% of GDP. Speaking to senior representatives of businesses across this sector, it was remarkably easy to see from whence this projected growth is arising. Companies are establishing new

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facilities across the country. Trucks and other vehicles are getting bigger, with higher capacities. Service providers regularly introduce all-new methodologies and options for their clients. Automations are becoming more intelligent, more integrated, and delivering more efficiency.

Located near several of Peru's largest mining projects, among them Cerro Verde, Cuajone, Toquepala and Quellaveco, Arequipa is a hub of mining activity, hosting the all-important biannual PERUMIN conference, and serving as a primary or secondary base for a wide range of mining sector companies. The advantages of an equipment provider's presence in the city are obvious: proximity to the aforementioned range of major mining projects, as well as other mid-tier and junior operations; access to excellent, mining-tailored infrastructure, including Puerto Matarani, which is set to receive investments totaling US\$600 million by 2029 for upgrades; and, as an increasing number businesses establish themselves there, a close-knit enterprise network in one of Peru's most important industrial cities.

Bosch Rexroth, offering a suite of mining processing products including valves, hydraulics and conveyors, opened a new headquarters in Arequipa in November 2024. According to the company's general manager for Peru, Kai Rothgiesser: "This was an important step that reflects the confidence of our German headquarters in the Peruvian market."

Bosch Rexroth's Arequipa branch will work on the assembly of its HydraForce valve system and will be equipped with a workshop for servomotors used in automated equipment, among other products and services. Predicting that other businesses will likely elect to make a similar move, Rothgiesser continued: "Lima remains key for decision-making and clients, but I see the beginning of a movement to Arequipa that promises to intensify, marking an interesting evolution in the sector."

Another of the businesses within that evolution is Metso. Although the company already has a well-established base in Arequipa, where around 25% to 30% of its staff are based, it is expanding its presence with a new plant. "Our new plant not only helps us be closer to clients, but it also reflects our commitment to developing local talent," said Joe Pezo, Metso's vice president of services for Peru and the Andean countries.

Roxana Burgos, general manager at Movitecnica, also recognized the importance of an Arequipa base for the company, with the company recently having launched its own-brands of lifting and conveying equipment, Movilift and Movibelts: "This helps us reduce

"We want to provide equipment with simple, robust, and reliable designs, avoiding full automation, which competitors have adopted. In many cases, the

simplest solutions tend to be the most effective, and excessively complex systems often turn into new problems."

James Valenzuela, CEO. Resemin



"Producers are ramping up production to take advantage of rising commodity prices. With operations running longer hours, digging deeper, and equipment reallocated to move more ore, the demand for wear parts

is seeing a significant uptick."

Daniel Bacigalupo, Managing Director for Spanish-speaking Latin America, Weir ESCO

Weir ESCO, which in 2024 launched Nexsys, a rope-shovel lip system promising a 30% reduction in repair time and improved worker safety, is also betting big on automation and intelligent solutions. Nexsys integrates with the ShovelMetrics system offered by its sister company, Weir Motion Metrics, which monitors wear-andtear in real-time, alerting operators to lost or broken Nexsys teeth - of increased importance given the increased wear speed Bacigalupo

Describing Weir Motion Metrics' wider offer, with five modular, automatic monitoring solutions usable individually or in an centralized 'ecosystem,' Bacigalupo explained that efficiency gains are possible virtually throughout the mine production cycle: "Motion Metrics' systems allow tools to work together, optimizing every stage of the mining process, from the shovels to the crusher feed."

Weir ESCO is keen to expand the adoption of Motion Metrics' latest generation solutions to new projects, and to integrate them with its products already operating in the field.

Meanwhile, James Valenzuela, CEO of Resemin, takes a commodity prices as miners seek to produce more in response to broadly more conservative approach to automation. Having seen the evolution of the Peruvian mining industry over the company's 35 years of operations, Valenzuela argued that often less can be more: "The simplest solutions tend to be the most

unexpected stops and minimize additional costs, providing better service to our customers."

More, more, more? Automation

When GBR spoke to Armando Sugobono, general manager of Sandvik Peru, he was bullish on the potential for automation to spark major evolution in Peru's underground mining sector: "In surface mining, Peruvian companies are already aligned with global trends," he said, mentioned. "but the real opportunity lies in underground mining," he added.

Having observed two key trends in mining equipment – autonomous technology and lowering pollution - Sandvik's product releases have aimed to match market demand. Heightened commodity prices, he added, have been a key factor in their adoption: "The rise in copper and gold prices has led many mines to renew their equipment, with open-pit mines in particular betting heavily on automation to reduce risks for operators," commented Sugobono.

Daniel Bacigalupo, managing director for Spanish-speaking Latin America at Weir ESCO, noted another trend spurred by rising a strong market: "This implies operating more hours, working at greater depths, and reallocating equipment to move more ore, which naturally increases the consumption of wear parts," he said.



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"In Peru, and especially in Chile, the shortage of skilled labor is a significant challenge. Some projects require over 1,500 workers, and attracting talent is difficult since companies compete for the same pool of professionals."

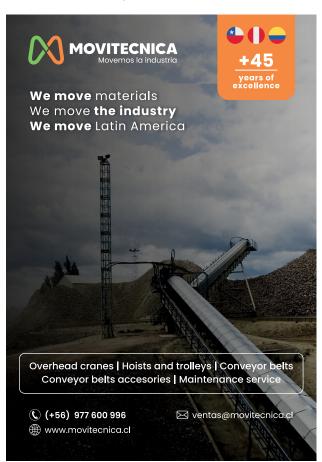
Roxana Burgos, General Manager, Movitecnica



effective, and excessively complex systems often turn into new problems."

Entirely automated equipment often fails to meet expectations. "Fully automated equipment generally requires constant support, such as specialized engineers, which increases operational costs," he asserted.

This is not to imply, however, that Resemin's product offering contains no automation – indeed, its 'one-hole automation' system available for its drilling rigs is contributing to the company's international growth, with it recognized as a stand-out provider in a range of African markets. Instead, Valenzuela succinctly described his approach as "to float like a butterfly, and sting like a bee" – a philosophy that has guided Resemin's direction of technological innovation and market expansion.



"In politically challenging times, producers prioritize expanding existing projects, such as

brownfields or nearby infrastructure, over greenfield developments. Activity shifts but does not stop."

José Arce, Head Geophysicist, Arce Geofísicos



Diving into the details: Service providers

For service providers in Peru's mining industry, including laboratories and geophysical surveyors, getting 'bigger' often means virtually the opposite – that is, diving down into the smallest, most technical details. As Arce Geofísicos celebrates its 65th anniversary of operations in high-technology geophysical exploration services, head geophysicist José Arce told GBR how the company has continued to bring new, ever-more precise techniques to Peru and other markets across South America: "We work closely with geophysics equipment manufacturers for constant improvements. For geophysical quality control and processing, we have developed many proprietary tools that allow us to have better precision and quality in the final results."

That has included innovations in the application of gravimetry studies – previously challenging due to Peru's rugged topography – with advanced mathematical correction solutions; and the recently increasing use of magnetotelluric (MT) methodologies.

At Bureau Veritas Perú, economic opportunities presented by rising mineral demand are opening up avenues for new services, techniques and innovations. 2024 brought about a new strategic partnership on an historic project for Peru: the reprocessing of tailings at Cerro de Pasco's Quiulacocha mine, encompassing new drilling, transport and testing techniques – including the need to freeze drill cores, due to challenges in their handling. "This has required innovation at all levels," said Stefano Raffo, general manager for Bureau Veritas' metals and mining division, but will enable the extraction of highly in-demand critical minerals: "The tailings contain essential elements for modern industries such as electronics, semiconductors, catalysts and electric vehicles," he explained.

Erika Gabriel, general manager of BIZALAB, another laboratory focused on mineral analysis, revealed how the company's focus on innovation is helping it adapt to newly emerging market challenges: "We have incorporated innovative techniques, such as automated mineralogy, which have allowed us to overcome complex challenges in the mining sector, such as the treatment of minerals with particular characteristics [...] Lithium and other critical minerals are usually in low concentrations, which requires specialized equipment for their processing. We know that we have to adapt to these needs, using new techniques and equipment."

Moving to bigger things: Trucks and transport

"In Peru, demand is growing especially for higher load capacity products, both in dump trucks and tractor-trailers [...] When prices rise, mines seek to produce more, which means they need more machinery and more productive equipment," commented

"We are innovating by incorporating oil and gas technology to drill directional water wells from the top of the pit, avoiding interference with mining operations."

Miguel Ángel Arenas, General Manager, Geotec



Jorge Masías, general manager of Volvo Group Peru.

Comparing pre-pandemic sales to those in 2024, Masías highlighted that the number of 16-ton trucks sold in Peru has grown by at least 40%, from 6,000 to over 8,500, indicating heightened demand for these high-capacity vehicles.

Julio Molina, CEO of Komatsu-Mitsui Maquinarias del Perú (KMMP), explained: "Rising copper prices are driving investment, but machinery purchasing decisions depend on factors such as permits and customers' ability to expand operations."

With projects such as Antamina and Cuajone set to expand, Molina expects increased investment to follow: "Many operators are investing in fleet renewal, especially in new trucks and equipment with more advanced technologies."

KMMP is looking to also further develop its offer for underground miners, and is growing its presence in Arequipa.

Nikolas Gremler, general manager at Divemotor, which distributes trucks, buses and other vehicles from brands including Mercedez-Benz, Freightliner and Jeep, observed increasing momentum for lowemission and electromobility in Peru's mining transport market: "As mines adopt international regulations that demand more sustainable technologies, at Divemotor we continue to drive solutions that help our customers meet these standards, optimizing their operations without compromising performance."



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Jorge Granda, CEO, AK DRILLING



Julio Molina, CEO, Komatsu-Mitsui Maquinarias Perú (KMMP)



Kai Rothgiesser, General Manager, Bosch Rexroth Perú



Erika Gabriel, General Manager, BIZALAB

A 'hole' new world: Innovations in drilling and boring

Mining is about making holes. Whether major or junior, surface or underground, for exploration or construction, production or infrastructure, mining operations revolve around excavation. Two important methods contributing to this endeavor are drilling and boring. Geotec, a Peruvian drilling contractor, has been adding new equipment and services, which general manager Miguel Ángel Arenas suggested could optimize and simplify operations in a variety of use cases. The first of these new services is an insitu injection leaching system used on leach pads, in which a hole is drilled, via reverse-circulation, directly to a deposit in the pad, and a solution is pumped in to pull the material up through the hole extracting leached ore that was previously inaccessible. "Our client managed to increase its production by 50% to 55%, which shows the great potential of this technology to optimize resources and revitalize operations," said Arenas.

Separately, Geotec has also been incorporating technology from the oil and gas industry, developing a new method to drill directional water wells for dewatering of open-pit mine operations. Conventional dewatering methods require equipment to be placed within the pit itself, which can interfere with mining operations. In this innovation, Geotec locates the equipment outside of the pit, drilling into it from above, cutting out those inefficiencies. Arenas assured: "This unprecedented project could revolutionize the way drainage is managed in mining."

Another company incorporating new methods and technologies into its products and services, this time primarily based in the boring sector, is TUMI Raise Boring. For Marc Blattner, CEO of parent company TUMI Group, this continual



development is something of an existential question for the company: "In a niche market like raise boring, there is only so much work in the world. So, we have sought out new revenue streams, new product innovations," he said.

As such, Blattner and his colleague Carlos Dellepiane, general manager at TUMI Raise Boring, have been moving the company's focus increasingly towards production drilling and mine development, applying their expertise on raise boring techniques and technologies to wider mining operations. One example is a boxholing machine undergoing testing in Brazil, which allows for the creation of a 'burn hole' – a cavity for blasted rock to fall into – making production processes more effective."



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