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Peru's Mining Sector: Rethinking the Future

As the industry becomes more dynamic globally, new strategies are required to avoid fresh growing pains

It has been an interesting start to the year for the mining industry. With decent gold and silver prices and a very positive upward trend in base metal prices over the last months, miners worldwide seem to have more confidence in the near-term future. In Peru, leaders surveyed confirm that activity is picking up and that operators, after a great deal of cost-cutting and efficiency-searching, are finally in a healthier position to make the investments in capital equipment, exploration and other

fields that had been deferred for the last three years.

It has been a long journey through the down-cycle. This experience should ensure that, while companies finally look for growth and new brownfield or greenfield projects, they do not neglect to focus on maintaining low production costs. According to Víctor Gobitz, president of the Peruvian Institute of Mining Engineers (IIMP) and CEO of Buenaventura: “The mining industry is a price-taker. We can-

not assign different attributes to what we produce to sell it at a higher price, like the automotive industry does, for instance.”

Hence the efforts by mining operators to keep a sustainable cost base and assure their margins. Peru is already one of the most competitive mining producers worldwide, as highlighted by the International Monetary Fund in a recent report. Reasonable labor costs and a favorable exchange rate during 2016 played their part, but managers locally also implemented a number of strategies to make the most of their existing operations.

Luis Rivera, executive vice-president for Gold Fields in the Americas region, explained how the company achieved significant savings at their Cerro Corona gold-copper mine in Cajamarca during 2016. The measures implemented included the use of additives to diminish fuel consumption, a more productive blasting process, the implementation of the Dispatch system for more efficient haulage, the installation of a gravimetric circuit for higher gold recovery and an increased copper recovery rate through the use of better reagents. “In 2017, we are trying to improve our mine wall conditions to access deeper mineralization with higher grades. This, coupled with our better cost position, would allow us to expand our reserves and extend the mine life. Also, we have 7 million metric tons (mt) of oxides that are not included in our mining plan today. Before the end of the year we could have a feasibility study for a leaching process facility,” said Rivera.

Such efforts are replicated across the underground segment as well. Hochschild Mining, a precious metals producer, currently has all-in sustaining costs of \$11.5 per ounce of silver equivalent, as compared to \$21.7 five years ago. Meanwhile Southern Peaks Mining has reduced the production cost at Condestable, a medium-sized copper operation, from \$42.9/mt processed in 2013 to \$25/mt today.

Adolfo Vera, president and CEO of Southern Peaks, explained that the company has always been comfortable hedging some of their production to minimize the risk of short-term market fluctuations, but emphasized that they have also introduced significant longer-term changes to the operation since they acquired the asset from Tráfico in 2013: “We have migrated towards massive methods that are less labor intensive. 70% of our production is achieved through sub-level stoping, as opposed to 30% before [...] A paradigm shift is to see Condestable as a poly-metallic mine and no longer as a copper mine. In the past, we have always focused on the copper head grade, but now we analyze the copper-equivalent grade,” Vera said.

ADDRESSING THE SHORTAGE OF NEW PROJECTS

According to estimations from the Ministry of Energy and Mines and Peru's Central Reserve Bank, total mining investments fell by nearly half year-on-year, from \$7.5 billion in 2015 to less than \$4 billion in 2016. As Las Bambas and the expansion of Cerro Verde saw their completion, there are no new copper mega-projects on the horizon, at least not immediately. The \$1.2 billion expansion of Southern Copper's Toquepala operation is currently the largest project under implementation, but since social issues put a stop to emblematic projects such as Conga and Tía María, the general election and a fairly depressed copper outlook did not help the industry push for new ventures.

To date, there are no new investment announcements being made, yet winds of change can be felt. The election of Pedro Pablo Kuczynski last year, a business-friendly president, wiped off the uncertainty about the general direction of the country's economy for the next five years. Production constraints at Escondida in Chile and Grasberg in Indonesia, two of the largest copper mines worldwide, have accentuated the upward trend of the copper price in recent weeks, providing a bet-

"For Peru to continue having mega-projects, the country needs to change its model. Mega-projects cannot be developed on their own –instead, they need to capture some synergies that will translate into shared railways, shared tailings dams, shared pipelines and shared roads. Only this way can both the footprint and the costs that currently make projects unfeasible be reduced."

Luis Rivera, executive VP Americas Gold Fields



ter picture for new project developers. Last but not least, the election of the CEO of Anglo American in Peru, Luis Marchese, as president of the SNMPE, the main industry association, is a sign that the company will sooner or later move ahead with the Quellaveco copper project, after years of back and forth.

It seems clear that Peru will receive new greenfield investments over the next years, but for that to happen, the authorities need to make sure all the conditions are met for investors to spend money in Peru rather than in other jurisdictions. Competition is tough and countries like Ecuador and Argentina are tak-

ing decisive steps towards developing their mining industries. Companies with assets in Peru, like Fortuna Silver and First Quantum, for instance, have already acquired assets in Argentina.

On the regulatory side, Peru is considered to be fairly competitive, and it has certainly proven to be a friendly investment destination for the last quarter of a century, a track-record that Argentina, with tax retention on exports and currency exchange limitations only abolished recently, cannot match yet. If anything, with the development of the industry over the boom years, Peru has suffered from an over-



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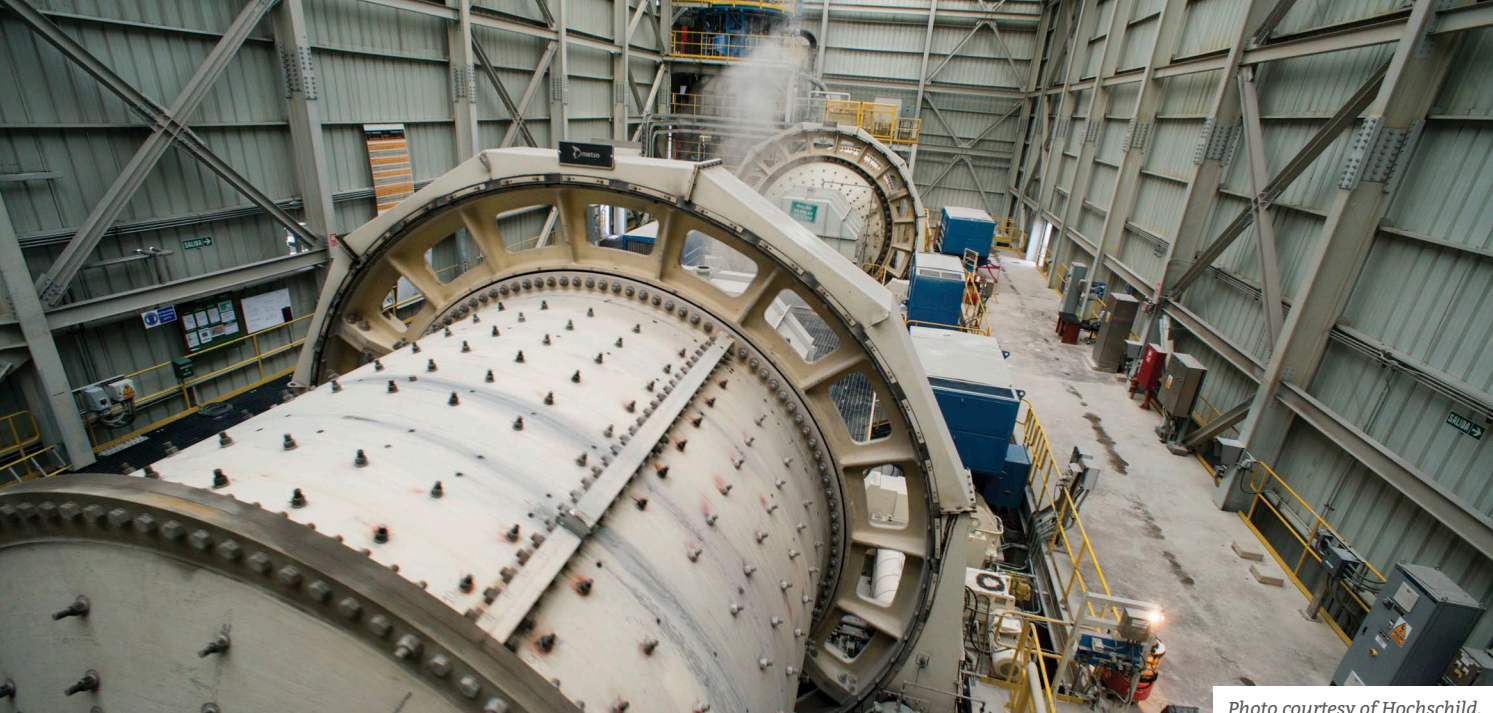


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regulation effort. According to Augusto Cauti, a legal advisor specialized in mining: “The legal framework in Peru is generally favorable to mining investments. However, when metal prices increased and social demands were not addressed by the State, several short-term political and regulatory measures created a bureaucratic obstacle for the day-to-day operations of projects [...] While mining is an extractive activity, from a regulatory standpoint it works as a ‘regulated sector’ in several aspects, like the power or the telecommunications sectors.”

COMMUNITY RELATIONS

Leaving aside regulatory matters, the social aspects are key, as shown by the fact that large mining projects have been derailed by unsolved disputes. Obtaining a social license has become an important risk factor that companies need to address from the beginning, and getting the go-ahead to build the mine and initiate production does not guarantee that the operation will not be halted later on. Las Bambas, one of the country’s largest copper mines, reached commercial production last year but has had to find alternative routes to take its concentrate to the port of Matarani as the locals have blocked the main road for months. Meanwhile, Hochschild Mining had to stop production at the Pallancata mine for more than a month due to another road blockade that ended in late January.

Ignacio Bustamante, CEO of Hochschild Mining, explained that the government played a proactive role in settling the dispute with the community, but he added: “Looking at the future, the government’s

role must be that of preventing conflicts. In this respect, the authorities need to better understand the sector and have more intelligence on the different actors around the mines. Hochschild’s operations are located in very remote areas where the State has no presence at all. In the Pallancata conflict, some of the demands from the community were related to services that must be provided by the State, not the company.” Another aspect to be considered is the domino effect that a conflict in a particular operation can have over a neighboring mine or project. First Quantum Minerals, for instance, decided to postpone resettlement discussions with the communities in the Haqira project, a deposit hosting 6.5 million mt of copper, until the social context in the Apurimac region calms down a bit. Haqira would require around 1,000 people to resettle. Mike Parker, general manager for South American projects at First Quantum, explained the rationale behind this move: “Apurimac is undergoing profound changes with the influence of Las Bambas and nearby Constanca in Cusco to some extent. That still has to settle down. Dialogue tables have been created in an effort to allow the central government, Las Bambas, local authorities and communities to discuss how to implement pending development projects. That situation does not bode well for a project like ours to try to talk about resettlement, so completing the EIA is the priority while we still engage with the local communities to keep a positive relationship.”

The authorities should take these issues very seriously because not long ago First Quantum had a clear plan to build Haqira after Cobre Panama, while today the company is keeping its options open with the

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“The mining sector is perceived as distant because it is an activity that takes place mostly in the high Andes, where human development indexes are very different to those in the cities. This generates high expectations that are difficult to manage”.



Víctor Gobitz,
president, IIMP

possibility of building Taca Taca in Argentina first. Taca Taca would require no community resettlement, even though longer-term political risk in Argentina also needs to be taken into consideration (Taca Taca is a 28-year project). In any case, most leaders agree that the Peruvian government needs to extend its presence across Peru's vast territory to reach the country's dispersed population with basic social services, otherwise the communities will demand mining companies address these needs. The model of the Mining Canon, whereby a percentage of the income tax paid by the mines goes to the regional and local governments, has proven ineffective, due to the inability of the different institutions to execute development projects in a timely manner. Earlier this year, the central government approved a decree to create the so-called Social Advance Fund, which aims at investing in basic infrastructure for the local population in target areas where big investment projects are expected to take place. While this shows the Kuczynski's government good intentions, how this fund will actually be deployed is unclear for the moment.

To build trust, mining companies also need to play their part, abandoning their classic low profile and explaining to the wider population

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Ignacio Bustamante, CEO, Hochschild Mining



how the mining industry works. In the words of Víctor Gobitz, president of IIMP: "The mining sector is perceived as distant because it is an activity that takes place mostly in the high Andes, where human development indexes are very different to those in the cities. This generates high expectations that are difficult to manage".

A FRESH LOOK AT PROJECT DEVELOPMENT

Over the last years, the various Peruvian governments have boasted of the country's extensive mining project portfolio to attract investors worldwide. Even with some unfortunate exceptions where projects were stopped, official figures show that the industry invested

\$53.5 billion in Peru between 2006 and 2015. According to the Ministry of Energy and Mines, the portfolio of future mining projects now stands at \$45.5 billion, a third of which already have their environmental impact assessment approved.

Some of these projects have been in the pipeline for far too long. While the Southern belt has developed tremendously over the last years, the large copper and gold projects in the north are not seeing much movement. After Conga was suspended, the copper price went down and the project became economically unviable. Meanwhile, anti-mining sentiment in the region of Cajamarca remains high, as shown by the results of the general election last year. *(Continues on page 8)*

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"Positive decisions this year should translate into higher investment levels from 2018 onwards"

What is the vision of the Kuczynski administration with regard to the development of mining activities?

This government understands that a significant driver of Peru's economic development is our geological potential. Peru is and will continue to be a mining country. In recent years we have become the second largest copper producer and we are among the top five producers of other metals. The conditions are there for us to maintain this leadership position, because we have only explored a small portion of the country.

Over the last years, mining has been impacted by a combination of external factors, with the end of the super cycle and the drop of commodity prices, and internal factors, with an increase of what we call 'transaction costs' related to advancing projects to the operational stage. This has to do with the de-centralization of decision-making in many government agencies, with red tape and, in some cases, with social conflicts. We are introducing mechanisms to make the rules simpler and to expedite procedures at the exploration stage. In environmental matters, we are implementing a single window and electronic processes. Finally, with regard to social conflicts, the previous government left a wide perception that it failed to fulfill the commitments it had with the communities. We want to rebuild trust with a more coordinated State presence in the affected areas.

"We are introducing mechanisms to make the rules simpler and to expedite procedures at the exploration stage. In environmental matters, we are implementing a single window and electronic processes."

How is this government going to channel the investment into social development projects?

There are two mechanisms. On one hand, the Ministry of Finance is issuing sovereign bonds to fund infrastructure projects. The first of these offerings has already been completed to finance projects in Cajamarca. On the other hand, in January the government created the Social Advance Fund that articulates the activities of several ministries to work together and address the needs of these regions with diverse sources of funding, from government resources to donations from multilateral bodies or companies.

"In the same way that this government is changing its approach towards community relations, we have told the owner of Tía María that they also need to change their strategy to promote the project."

Peru has had mixed results in terms of the development of basic infrastructure. How can this record improve?

In the main mining regions you can see an improvement of the socio-economic levels. Probably, in those areas where there has been a bigger involvement of private parties, the projects have obtained better results, either through the Works for Taxes program or the Voluntary Contribution program. In those projects that were handled by the State, we have seen the country's weaknesses, with delays in the execution and the develop-

ment of projects that do not solve the people's most basic needs, such as stadiums or bullrings, instead of systems for drinking water and sanitation. It is a complex problem of a sociological and anthropological nature.

Mining investment in Peru has fallen consistently since its peak in 2013. When do you expect this trend to be reversed?

In recent years, we have seen the completion of world-class projects, such as Las Bambas, Toromocho and the Cerro Verde expansion. It is absolutely normal that expenditure levels decrease after projects of that size. That being said, metal prices are improving and we expect companies to take positive decisions this year with regard to new projects, like Pampa de Pongo, Corani and Mina Justa, which should translate into higher investment levels from 2018 onwards. We also expect a decision on Quellaveco mid-2018.

How do you read the election of Anglo American's CEO in Peru as president of the main industry association, the SNMPE?

There has been a tradition that those leading the Mining Society (SNMPE) are the companies that have the most important projects in the pipeline. It is excellent news that Luis Marchese is the new SNMPE president, because from our perspective it shows Anglo American's commitment. We are telling Anglo American that the government is very interested in seeing the project move ahead. Quellaveco has pretty much everything ready to get started.

What is your position about Southern Copper’s Tía María copper project?

In the same way that this new government is changing its approach towards community relations, we have told the owner of Tía María that they also need to change their strategy to promote the project. If they do exactly the same things as before, that change is not going to happen. The company has appointed a new manager to develop the project, and we expect some progress if they manage to improve their relationships within their areas of influence.

Do you think the future of Yanacocha will be more attached to underground development rather than large projects like Conga?

It is an option that Yanacocha is evaluating because it presents lower social costs and it allows for the reduction of the project’s footprint. Right now, Conga is not Newmont’s priority; it probably sits further down the line.

Beyond Conga, Cajamarca has enormous potential for large copper projects, such as Michiquillay, Galeno and La Granja. Due to the region’s complex social situation and the high capex levels of these projects, how can the State

help to build common infrastructure and generate synergies?

Each of the aforementioned projects require complementary infrastructure for their development. At some point, a study was made for the construction of a railway to take concentrates from Cajamarca to the Bayóvar area, however these projects have been evaluating their own solutions and their own schedules to start commercial production. It is a challenge to have better coordination among the different companies, and this will take a few years to bear fruit.

"The environmental problem in Madre de Dios is very serious, and our position is very clear to be against the development of alluvial mining."

What can be done to solve the problem of illegal mining in Madre de Dios, and what has this administration changed with regard to the formalization process of the previous government?

The environmental problem in Madre de Dios is very serious, and our position is very clear to be against the development of alluvial mining. Having said this, the new formalization process looks at addressing some of the limitations of the previous process, which had very poor results. We have tried to improve the economic incentives to encourage formalization, to strengthen the relationship with the regional governments, and to create a mining fund to promote the production of clean gold in Peru.



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(Continues from page 5) For both economic and social reasons, industry leaders are asking for a fresh, cooperative approach to mining development. For any project, building all the required infrastructure can become too costly now that metal prices are not expected to go back to the boom levels of 2011. Then, from an environmental and social perspective, reducing the footprint of these mega-projects seems a necessary step to obtain the social license in regions where mining is a hot potato of political debate.

In the words of Luis Rivera of Gold Fields: "Mega-projects will need to capture some synergies that will translate into shared railways, shared tailings dams, shared pipelines and shared roads. Only this way can both the footprint and the costs that currently make projects unfeasible be reduced."

Víctor Gobitz of IIMP and Buenaventura agreed: "In Chile there is already an example of this type of collaboration, with Goldcorp and Teck. In the case of Peru, Quellaveco sits in a region with existing infrastructure. Similarly, you could have different players working together in Cajamarca's copper area, where you have Michiquillay, Conga, Galeno and even La Granja [...] With all these projects put together, Cajamarca could produce over 1 million mt/y of copper."

The plan seems ambitious but reasonable, and would be better implemented if the government acted as a catalyst for industry efforts, designing and implementing a macro, long-term plan for the development of the country and its mining industry. Peru is already one of the largest mining countries worldwide, but there is enormous potential left.

"We have migrated towards massive methods that are less labor intensive. 70% of our production is achieved through sub-level stopping, as opposed to 30% before. A paradigm shift is to see Condestable as a poly-metallic mine and no longer as a copper mine."

**Adolfo Vera, president and CEO,
Southern Peaks Mining**



"We have a strong belief that copper demand will remain high. There are mines that are reaching the end of their lives, while there are also mines that are becoming uneconomic, due to depth or grade constraints, so we will need to replace copper production over the next decades."

Mike Parker, general manager projects South America, First Quantum Minerals



Production and Exploration

Copper output broke the 2 million mt/y barrier during 2016

It was another great year for Peru's copper production. With the completion of Cerro Verde's expansion, operated by Freeport McMoRan, and the start of commercial production at Las Bambas by MMG, total copper output reached 2.35 million metric tons (mt) during 2016, a 38% increase year-on-year and a 70% increase over 2014 figures. Thus Peru reinforces its position as the world's second largest producer of the red metal after Chile, while Chinese copper output only grew by 11%, for a total of 1.85 million mt/y.

Company-wise, and according to the preliminary data released by the Ministry of Energy and Mines, Cerro Verde became the largest contributor with 522,100 mt/y (+104%), followed by Antamina with 443,600 mt/y (+8%), Las Bambas with 329,400 mt/y and Southern Copper with 312,900 mt/y (-3%) between the Toquepala and Cuajone operations. Southern Copper is actually expanding Toquepala through a \$1.2 billion investment, to add an extra 100,000 mt/y of copper starting next year.

In terms of zinc, while operators took advantage of improved metal prices in the later part of the year, overall production went down by 6% to 1.34 million mt/y. This was caused primarily by a 12% decrease in Antamina's zinc output to 261,500 mt/y, which placed Volcan, who also suffered a 4% reduction, as the country's largest zinc producer with approximately 273,400 mt/y. Antamina, however, expects to boost zinc output this year to reach more than 340,000 mt/y. The other large zinc player in the country is Milpo, part of Votorantim of Brazil, that reported production of 258,700 mt in 2016.

In other base metals, lead production remained flat at 314,100 mt/y, tin production decreased to 18,800 mt/y (-4%), and molybdenum output grew by 28% to just under 25,800 mt/y, helped by Cerro Verde and Antamina, which trebled and doubled their production figures, respectively.

PRECIOUS METALS

Yanacocha's decline continued during 2016, with gold output reaching 668,200 ounces per year (oz/y) (-27%). Meanwhile, Barrick also saw

production fall at the Lagunas Norte mine, from 560,000 oz/y in 2015 to 435,000 oz/y in 2016, with all-in sustaining costs of \$529/oz. In spite of that, Peru's gold production grew by 4% for a total 4.92 million oz/y. Some of the companies that contributed to this growth were Hochschild Mining, with the production from its largest operation, the Inmaculada gold-silver mine; and Minera Poderosa, that yielded 221,000 oz/y in 2016, a 12% increase year-on-year.

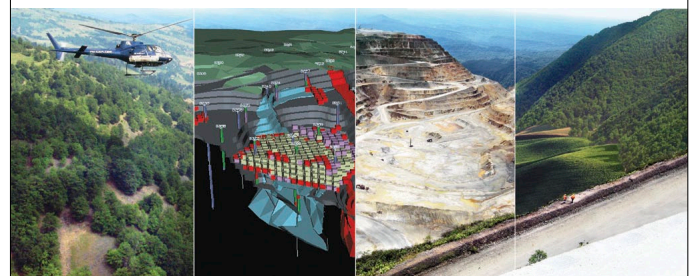
Marcelo Santillana, general manager of Poderosa, summarized the company's recent developments: "In 2016 we met our growth targets. We obtained the permit to implement technological improvements and process 800 mt/d at our Marañón plant, and we began the studies to expand our Santa María plant to 1,000 mt/d. For this project, we will have to acquire additional equipment, including two larger mills and a 1,000 mt/d crusher, however the largest expenditure will be the tailings dam at a cost of \$10 million."

Poderosa currently has 8 million oz of reserves, which would extend the operation's life to nearly 40 years at current production rates, however the company plans to invest \$40 million in exploration during 2017. Additionally, Poderosa is currently building a transmission line to assure



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the power supply for its expanded operation, which will use an additional 2 MW of capacity. Recent highlights in terms of precious metals operations include Tahoe Resources' Shahuindo, which started commercial production in 2016 and is currently expanding, and the inauguration of Buenaventura's Tambomayo mine, located in Caylloma (Arequipa) at 4,800 meters above sea level. Víctor Gobitz, CEO of Buenaventura, gave more details about the latter: "Tambomayo, developed in record time since 2009, has overcome a tremendous logistical and technical challenge and will yield 150,000 oz/y of gold and 3 million oz/y of silver. It is an underground mine that optimizes metallurgical recovery and uses filtered tailings disposal to assure the industry's best practices," he said. Peru's silver production also increased in 2016 by nearly 7%, reaching 140.6 million oz/y, with Buenaventura (24.7 million oz/y), Volcan (22 million oz/y), Antamina (20.9 million oz/y) and Hochschild (13.9 million oz/y) as the main producers. With precious metals prices relatively stable, 2017 looks like it will be a good year for cost-competitive Peruvian producers: "We have a conservative price forecast of \$1,150/oz gold and \$16/oz silver, although I believe we will be seeing higher prices than that," declared Ignacio Bustamante, CEO of Hochschild.

The improved market conditions are also attracting new players to Peru. Great Panther Silver, a producer with assets in Mexico, recently signed a deal with Nyrstar to acquire the Coricancha mine in Peru, primarily a precious metals deposit with a base metals component, that had been in care and maintenance for some time. Once the final deal is closed, the company expects to conduct a preliminary economic assessment this year, and to invest between \$20 million and \$25 million to put the mine back into production.

Robert Archer, president & CEO of Great Panther, said: "One of the things that struck me in Peru is that there are not many medium-sized projects owned and operated by public companies. I saw a lot of opportunity for public companies of our size with access to the capital markets to bring some of these mines into production. We want Coricancha to be our first base of operations, and then gradually grow in the country in the same way we have done in Mexico."

EXPLORATION PROJECTS

In the junior segment, two main trends appear in the market. On one side, you have those juniors who have learnt to navigate the low cycle through innovative business models, mostly aiming at generating cash-flow. On the other,

the few juniors left with good assets and access to finance have benefited from much better market conditions to keep advancing their projects.

Cash-flow generating models go from developing small mining operations with the support of contractors and third party mills, like Lupaka Gold and PPX Mining are doing, to the capital participation in toll processing businesses, following the successful model of Dynacor. Inca One Gold Corp and more recently Montan Mining and Duran Ventures have been investing in the development of mineral processing facilities in Peru. "Dynacor's model involves processing gold ore and financing our exploration with the profit, thereby avoiding dilution to our shareholders," said Jean Martineau, president and CEO of Dynacor.

Last year, Dynacor completed the construction of its new, 300 mt/d mill in Chala, Peru. The company processed third-party ores for a production of 73,500 oz/y last year, and expects to reach between 88,000 to 92,000 oz/y in 2017. "Our mill is built to the specified ore in the Peruvian mines in order to maximize the recovery rate. Over the years we have built up our knowledge and learned how to process the ore efficiently, blending the material in the best possible way to improve our production results," Martineau concluded.

With regard to the more traditional juniors that add value through the drill-bit, Regulus Resources and Tinka Resources both have a favorable position to keep advancing. The two companies had no problem to raise C\$14 million and C\$11 million respectively last year, and both have planned extensive drilling campaigns for 2017.

Regulus Resources is focusing on its AntaKori copper project in northern Peru, located next to the Tantauatay gold-silver mine operated by Coimolache, a joint venture between Southern Copper and Buenaventura. Regulus has recently signed an exploration agreement with Coimolache to collaboratively share information and better understand the potential of the district. "Coimolache have basically bumped up against our land package," declared John Black, CEO of Regulus.

AntaKori already has a copper-gold-silver resource of 295 million mt at a copper equivalent grade of 0.8%, which the company expects to expand this year through a 15,000 to 18,000 meter drilling campaign.

Black gave more details about the geology of the project: "Previous drilling campaigns at AntaKori found extensive skarn mineralization that remains open in most directions and is similar to other occurrences in Peru, most notably Las Bambas and Antamina. At AntaKori,

the skarn mineralization is cut by breccia bodies with fragments of porphyry copper-gold mineralization, indicating probably porphyry mineralization at depth [...] [Gold Fields] Cerro Corona, located 6 km from us, is a porphyry deposit currently in production.”

Meanwhile, Tinka Resources has benefited from the extraordinary run of the zinc price over the last few months. After the company’s share price hit rock bottom in the first months of 2016, the market situation changed drastically for the better. Indeed, zinc had not traded at more than \$1.20/lb since 2008, noted Graham Carman, president and CEO of Tinka.

Last year, the company released a new resource for its Ayawilca project in Central Peru, with 18 million mt at a zinc equivalent grade of 8.2%, while it also ran initial metallurgical tests. “We took the typical grade from a chimney at West Ayawilca, grading 7% to 10% zinc, and we obtained a 52% zinc grade concentrate with no pollutants. There is some iron associated with the sphalerite, but there are no penalties for arsenic or manganese. This first study was to see if we could produce a marketable concentrate, and the answer is yes, we can,” said Carman.

While last year’s resource estimate unveiled a potentially valuable tin component in the deposit, Tinka’s focus right now is on the zinc. Carman added: “I think we are very close to the point where the project has enough tonnage already, but we want to make it more robust and prove there is potential for much more mineralization [...] The exploration objective this year is two-fold: to target a global resource of over 30 million mt, and to continue to add significant high-grade chimney-style zinc mineralization.”

“At AntaKori, the skarn mineralization is cut by breccia bodies with fragments of porphyry copper-gold mineralization, indicating probably porphyry mineralization at depth.”



**John Black, CEO,
Regulus Resources**

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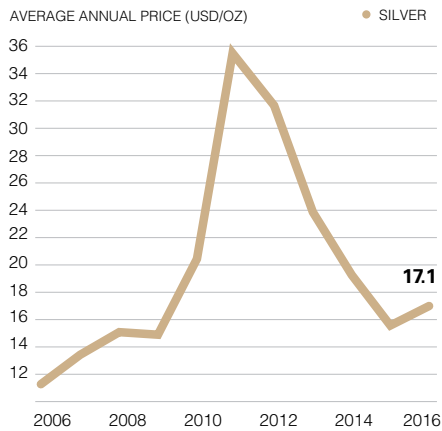
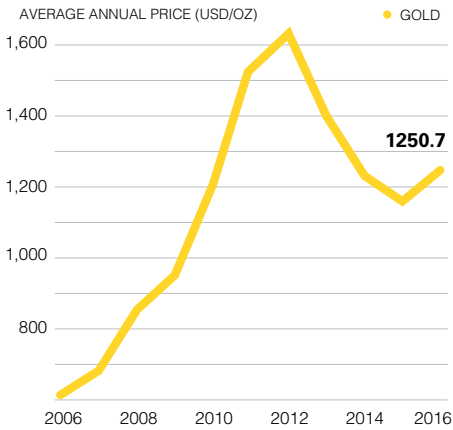


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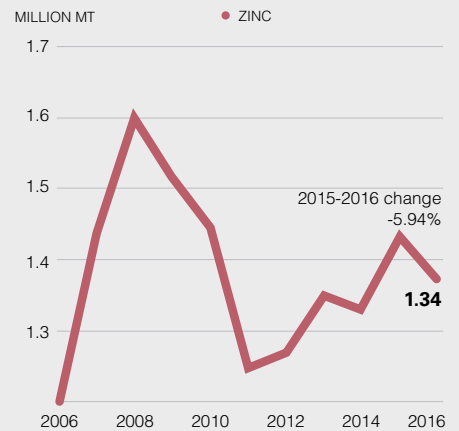
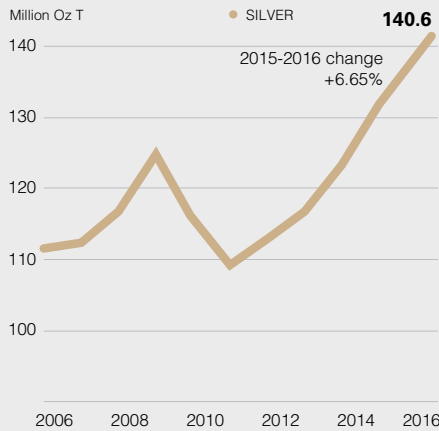
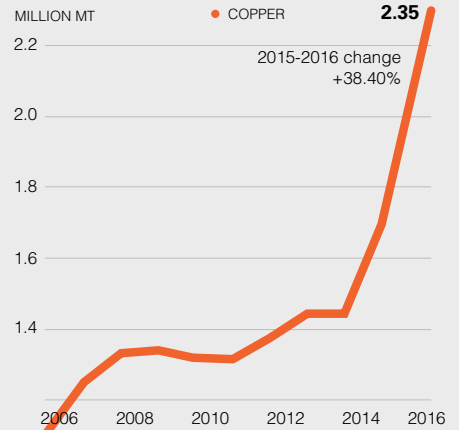
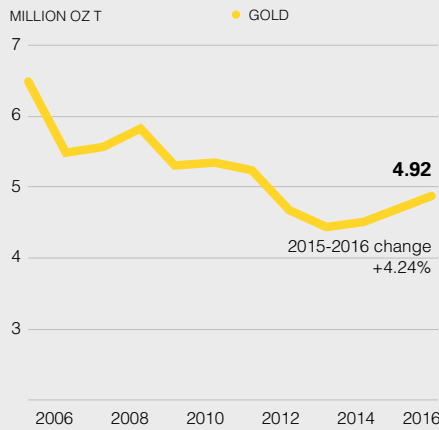
GOLD AND SILVER PRICE CHARTS

Sources: KITCO / GBR



PERU, A DIVERSIFIED METALS PRODUCER

Source: Ministry Of Energy And Mines / GBR



ZINC PRICE (MONTHLY AVERAGE, 2016)

Average official LME price, Cash Buyer

Sources: LME / GBR

| Year | \$/MT | \$/LB |
|----------------|-------|-------|
| 2016 January | 1,512 | 0.69 |
| 2016 February | 1,710 | 0.78 |
| 2016 March | 1,804 | 0.82 |
| 2016 April | 1,851 | 0.84 |
| 2016 May | 1,871 | 0.85 |
| 2016 June | 2,022 | 0.92 |
| 2016 July | 2,184 | 0.99 |
| 2016 August | 2,282 | 1.04 |
| 2016 September | 2,292 | 1.04 |
| 2016 October | 2,314 | 1.05 |
| 2016 November | 2,568 | 1.16 |
| 2016 December | 2,671 | 1.21 |
| 2017 January | 2,712 | 1.23 |

COPPER PRICE (MONTHLY AVERAGE, 2016)

Average official LME price, Cash Buyer

Sources: LME / GBR

| Year | \$/MT | \$/LB |
|----------------|-------|-------|
| 2016 January | 4,462 | 2.02 |
| 2016 February | 4,594 | 2.08 |
| 2016 March | 4,947 | 2.24 |
| 2016 April | 4,850 | 2.20 |
| 2016 May | 4,707 | 2.14 |
| 2016 June | 4,630 | 2.10 |
| 2016 July | 4,855 | 2.20 |
| 2016 August | 4,757 | 2.16 |
| 2016 September | 4,706 | 2.13 |
| 2016 October | 4,731 | 2.15 |
| 2016 November | 5,442 | 2.47 |
| 2016 December | 5,665 | 2.57 |
| 2017 January | 5,736 | 2.60 |

When Work Came Straight to Our Door

After significant downsizing and diversification, engineering companies need to keep their eyes open for a potential upturn in mining investments

During the boom years, consultants had their hands full. The large amount of projects in the market caused some headaches, such as the pressure on deadlines, human resources and salaries. Yet on top of the economic benefits of a buoyant business, the great advantage was that, for the most part, engineering players did not have to leave their desks to hunt for new jobs. "Work came straight to our door", remembers Alberto Coya, general manager of MWH, a company that recently merged with Stantec.

The last three years were very different. Big names in the engineering business had to downsize, create synergies within the different offices, look for new opportunities in new sectors and new countries, and develop commercial skills they had forgotten to be necessary. In the particular case of MWH, even under those conditions, mining

still represents 85% of the Lima office's business, the remainder coming from energy projects. The company has traditionally specialized in wet infrastructure, and last year it completed two emblematic projects for one of the country's largest copper producers: a very large tailings dam, and a water treatment plant near the Chili river in Arequipa.

One of the strategies of MWH to offset the decrease of new mining jobs is to try to do work again for the public sector, namely in sanitation and irrigation projects, but the merger with Stantec is opening up new opportunities for the company in the mining sector as well. "Stantec has good expertise in underground mining in terms of reserve and resource calculation, energy for mining projects and material handling," explained Coya, who points out that Stantec has chosen MWH's 140-strong Lima office as the base from which it will try to grow its

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"We recommend to our clients that, before embarking on a change of the mining method, they should carry out a study of the behavior and geomechanical characteristics of the mine, otherwise they can drastically increase dilution and even create a global stability problem, making the operation uneconomic."

Antonio Samaniego,
director, SRK Consulting



underground mining offering in Latin America. Similarly, the Lima office of SRK Consulting has also expanded its scope after the multi-national consultancy merged with SVS Ingenieros in Peru, a local company with a long track record in the market. Now fully rebranded as SRK Consulting, the company has access to SRK's global network and has added significant resource evaluation capabilities to the areas of practice previously available with the SVS team.

Antonio Samaniego, director of SRK Consulting in Peru, affirmed that the firm managed to minimize lay-offs in Lima during the downturn, but that the market forced them to produce more work with the same team, while there was significant pressure on rates. "Over the

last months, one of the areas that has seen increased demand is due diligence reviews for project transactions, for either the buyer, the seller or the bank putting up the money," said Samaniego.

The focus on cost reductions by miners has also prompted consultants to produce numerous studies on operational efficiency, as Samaniego explained: "We have conducted many studies referring to mine services intended at controlling or lowering operating costs. Areas of focus included ventilation, dewatering and hydraulic backfilling."

To expand its offering in this segment, SRK recently acquired Mine Ventilation Services, a specialized firm in the United States.

The decrease in metal prices put a number of underground mines in a difficult position, and some operators decided to introduce changes to the mining methods with the view of achieving better costs. Samaniego believes that companies can obtain good results as long as proper studies are done in advance: "We recommend to our clients that, before embarking on a change of the mining method, they should carry out a study of the behavior and geomechanical characteristics of the mine, otherwise you can drastically increase dilution and even create a global stability problem, making the operation uneconomic."

FINALLY, EXPLORATION IS BACK

Mining Plus, an Australian consultant and part of Byrnescut, a large underground contractor, is already feeling positive changes in the market. While the start of the year is typically a slow period, the firm has just seen its best January ever. According to Paul Murphy, Mining Plus' manager for South America, not only the amount of work has been increasing over the last months –the nature of the jobs is also changing: "In the last few years we have been working on many cost reduction and deferral projects, which continue to be important, but greenfield projects (scoping, pre-feasibility and feasibility studies) and regional explora-



tion programs are coming back.”

For Murphy, this is just how mining cycles work: “People sit on their hands and do very little while there is no money around, but when the money becomes available, everybody wants to do studies at the same time. Those who act quickly will have their mines in operation for the top of the price cycle – an opportunity no one wants to miss.”

Within the mining food chain, exploration is the first segment to react to cycles. It is the first one to see its budgets cut off when the industry enters a low trend, and it picks up quite quickly when metal prices rebound. While companies often think that all money available should be spent on drill holes, Murphy recommends saving a small portion of the budget for a more strategic implementation of the drilling campaign: “There is nothing worse than having a 50 by 50 meter spacing when you should have used 40 by 40 meter spacing.”

Murphy illustrated common problems associated to a lack of planning ahead: “We had a client who designed a drill program in 2D, only to find that the actual drill spacing on the vein was not as they thought it would be, leaving a big hole in the middle of the resource once the drilling was complete and the rig had left the site. What a nightmare! The bottom line is,

“When projects are put on hold, they seldom restart at the same stage they were left before. You may have a new owner with a different strategy, or market conditions that dictate significant changes to the project. Projects with completed feasibility studies often go back to a pre-feasibility stage. It takes a while until they move again beyond the studies phase.”

Pierre Montauban del Solar, country manager, Hatch



just take the little extra time to plan the program well and get the maximum tonnes converted for minimum meters drilled.”

SOCIAL ISSUES

Exploration campaigns also involve engaging in community negotiations at a stage when the local residents may not see the difference between a major company and a junior player, generating expectations that are very difficult to manage. The mining sector is no longer the one of 30 or 40 years ago, when operators and engineers only had to define the technical aspects of a project. Today, the social factor is a key part of the equation, and consultancy firms have expanded their scope

to assist clients de-risk the projects from this perspective.

POCH, a Chilean firm with 750 people across the countries of the Pacific Alliance, is working mostly on environmental and social projects in Peru, but it intends to use that base to grow its participation in the market in terms of its engineering capabilities. Francisco Rodríguez, the firm’s general manager in Peru, highlighted the importance of a holistic view of social issues right from the start: “The success of a project can be clearly defined within the first months of relationship with the communities,” he said. “Currently, between 12% and 15% of mining projects are facing social uprising by the adjacent localities or those in their area of influence. This is often explained by the companies’ vision of dividing the project in silos. At POCH we know that companies must re-engineer their projects looking at the community from the beginning, rather than expect the community to adapt to the new scenario.”

Photo courtesy of Southern Peaks Mining.



THE ‘SPONGE FACTOR’

2017 will be a very interesting year as it could abruptly change market needs. At a Peruvian level, there are no multi-billion dollar investments coming up immediately, yet the increased level of activity on all fronts, from exploration campaigns to new project studies and from operational efficiency to environmental and social work, could mean that consultancy firms suddenly need to mobilize stand-by experts and hire again to respond to market needs.

Mining is such a powerful industry in Peru that it has a ‘sponge’ effect, absorbing all resources available when the cycle is high. This could put an end to the shy diversification efforts by firms traditionally linked to the mining industry. Certainly, and despite all its flaws, many firms would be happy to see another mining boom over the next years: no-one will deny that having all the work come right to your door is pretty handy.



Photo courtesy of Hochschild.

A More Integrated Offering

Mining contractors consolidate their market positions by expanding the scope of their services and their geographic reach

The recent wave of mining investments (\$42 billion between 2011 and 2015) is unlikely to be repeated. Up until the peak in 2013, it was a rosy period for engineering and construction firms, earthmoving contractors, installation specialists and metal-mechanic companies, among others. Today, however, a lot of the *capex* work has given way to *opex* activities, as mining operators need to handle substantial production processes.

In this context, contractors have had to adapt. *Opex* work is less capital intensive and is probably less profitable than the large project construction work, but it offers the advantage of providing steady cash flow for providers.

One of the contractors that has expanded its scope is MUR-WY. Part of Aruntani, the largest Peruvian private gold producer, the company was initially dedicated to support the different mines of the group through the rental and

repair of equipment, but it has been targeting third-party business more aggressively over the last years, with a logistics and transport division that includes dangerous goods transportation and, more recently, an earthmoving division.

It is actually in earthmoving where the company sees better growth prospects, according to MUR-WY's general manager, Miguel Butrón: "Our largest project in earthmoving started in 2016 with the open-pit mining at El Brocal, where we have four large excavators and 70 dump trucks moving 100,000 metric tons of rock daily (mt/d), a figure that should increase to 130,000 mt/d this year. We have two other earthmoving contracts with Utunsa and Anama, part of the Aruntani Group."

Meanwhile, STRACON GyM, one of the largest mining contractors in the country, has now a 50-50 split between construction activities

and contract mining. The largest construction project it is involved with right now is Cobre Panama in Central America for First Quantum. In Peru, there are no projects of that size under construction.

Part of the Graña y Montero Group, STRACON GyM is using the synergies with the sister companies GyM and GMI (for construction and engineering respectively) to provide a more integrated solution beyond earthmoving and contract mining services to clients throughout Latin America. In parallel to this, it is also targeting underground mining opportunities, such as the recent development of the San Ramón gold mine in Colombia for Red Eagle. Right now, underground mining only represents 6% of STRACON GyM's revenue.

Steve Dixon, CEO of STRACON GyM, affirmed that underground mining should represent a bigger slice of the pie for the company in the

future: "There is a natural progression in the region to have more large scale underground operations, as well as changes in the way some of the underground mines operate. This will present opportunities for larger, more sophisticated contractors like us. We already see opportunities with Codelco in Chile, while in Peru, operations like Antamina and Yanacocha could also develop an underground model. In some cases, underground mining is also a way to reduce social risks."

OPPORTUNITIES BELOW SURFACE

With its long history in underground mining, Peru is home to some specialized underground contractors that are also adapting to the evolution of the market. TUMI Raise Boring, for instance, is a technology developer and contractor specialized in raise boring services with a fleet of 13 machines working in Peru and a headcount of 300 people.

Traditionally focused on raise bore holes for ventilation, TUMI introduced a new machine, the SBM 400 SR, in order to get involved in production drilling. Marc Blattner, general manager of TUMI, gave more details: "With the SR model we provide a hole at the center of the blasting zone [...] A normal setup time for a raise bore hole is five to seven days. With our machines, we can do it in about 45 minutes. The SR model is very much like a jumbo; you connect it to the power, the machine levels itself up, pins itself into place and does its work."

After a negative experience in Bolivia last year, the company is now targeting the Chilean market of box-hole services as a new opportunity for growth with a new machine that follows the same pattern of the SBM 400 SR. "Up until today, box-holing has used a very primitive technology. We are not trying to reinvent the wheel, we just want to use our experience to make the system much more efficient," explained Blattner, who believes that Codelco, with operations like El Teniente and Chuquibambilla, would be the perfect first client for this service.

One of the key areas of underground mining advancement is rock support, a segment where shotcrete application has become the standard in many Peruvian mines. Robocon is one of the key contractors offering the service and, similarly to TUMI, it also has in-house capabilities to design and build equipment to avoid relying solely on OEMs.

The company is currently expanding by more than 30% with two new contracts with Buenaventura at Uchucchacua and Tambomayo, which add to their presence in mines with Volcan and Pan American Silver, as well as their involvement at Yanacocha's exploration tunnels. Besides shotcrete application, the company has integrated vertically, implementing its own plants for the production of both shotcrete and cemented backfill. Robocon currently employs 850 people.

By expanding its range of services, Robocon has been able to offer its clients a more competitive package. Enrique Sattler, Robocon's general manager, explained that the company is also evaluating covering the scaling phase of the shotcrete value chain, while the firm has also introduced the concept of the *slick line* to Peru; a vertical pipe that is being installed in Volcan's Chungar mine. The slick line takes the shotcrete from surface down 500 meters through gravity: "With this technology the client can save significant time and costs associated with the transportation of shotcrete by mobile equipment. There are several very deep mines in Peru where this solution can provide great savings," affirmed Sattler.

A flat market in underground mining activities since 2013 seems to be changing rapidly. Mining operators that managed to reduce their costs to the very minimum are now opening up new fronts to make the most of better commodity prices. Contractors will need to keep up with this trend, expanding and renewing their fleets and training enough people to support the upcoming growth with quality services and a good safety record.

"We already see underground opportunities with Codelco in Chile, while in Peru, operations like Antamina and Yanacocha could also develop an underground model. In some cases, underground mining is also a way to reduce social risks."

Steve Dixon, CEO,
STRACON GyM



"With the slick line technology, the client can save significant time and costs associated with the transportation of shotcrete by mobile equipment. There are several very deep mines in Peru where this solution can provide great savings."

Enrique Sattler,
CEO, Robocon



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Equipment and Technology

After lots of repair and overhaul during the crisis, it is now the time to renew the fleets

The global mining equipment market is projected to grow by 2.3% annually over the next years, reaching an estimated value of \$80.8 billion by 2021, according to a Lucintel market report. In Peru, after approximately three years of capital investment reductions, business for equipment providers is finally picking up. As a result of the upward trend in metal prices and the optimism associated with the election of President Pedro Pablo Kuczynski, Peru is looking at a more dynamic market. Additionally, the general halt in purchasing new machines in recent years means that various mines have to finally acquire new equipment. Brian Doffing, president of Atlas Copco's surface and exploration drilling business and, until very recently, the firm's general manager in Peru, said: "Machines are not like wine; they

do not become better with time. At some point there is a pressure point where the net present value of buying new equipment and obtaining lower operating and repair costs makes it more efficient for the clients to replace the old machines." Therefore, Original Equipment Manufacturers (OEMs) with a strong presence in the market are preparing their operations to respond swiftly as demand for new units increases. The anticipation of growth has already sparked significant stocking efforts to avoid backorders. Meanwhile, new international players are also pushing to obtain a portion of the Peruvian mining pie. As an example, Liebherr of Germany sees significant opportunities to sell its mining trucks in Peru, most notably the T 284 model with a capacity of 400 short tons (363

metric tons). The company's sales manager, Carlos Ballesteros, explained that during 2016, Peruvian mining operations acquired a total of 50 high-tonnage trucks with a capacity of 320 short tons or more. This, he says, proves that there are bright opportunities for new players to enter the market. "Several mines in the country, including Antamina, are currently looking into renewing part of their fleet, while other mines, such as Las Bambas, require more trucks for their expansion," Ballesteros said. Increased metal prices will not translate into large new investment projects overnight, however, and thus many equipment companies continue to focus on the after-market segment. Austin Engineering, for instance, recently built a 3,000-square meter facility in



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Arequipa to provide maintenance and repair services in close proximity to clients in the region. In terms of new component sales, their star product is the truck body that can be fitted into an original Caterpillar or Komatsu mining truck. Since its establishment in Peru, the company has produced 120 of these locally, for clients including Hudbay, Antapaccay, Las Bambas and Southern Copper.

Austin is currently introducing the third generation of the JEC truck body to the Peruvian market, designed in Perth and called the JEC LD, which is being used by Rio Tinto globally and will also start working in mines in Chile and Colombia soon. "The new tray offers the client more payload based on less weight, optimized payload based on mine characteristics, reduced carry-back, reduced tail damage from berm dragging and stronger side wall protection," declared Tim Mitchell, general manager of Austin Engineering in Peru.

Mitchell emphasized that they are the only company manufacturing new truck bodies in Peru, while all the other players import them from plants elsewhere in Latin America.

In fact, manufacturing in Peru is somewhat unusual, yet local company Resemin is changing perceptions with unprecedented growth as a Peruvian manufacturer of drilling jumbos for

"Mines work under very harsh conditions in which high impact and abrasion are the key factors. Materials such as carbon fiber or others are not yet at an engineering or economically viable level to use in the construction of a truck body. The most economical material for this type of product at this point in time is anti-abrasive and high strength steel."

**Tim Mitchell, general manager,
Austin Engineering**



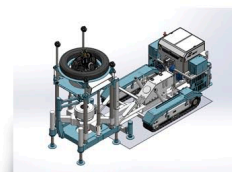
underground mining. Resemin saw its best year in 2016 with 62 machines sold, meaning a 25% increase in revenue according to Resemin's CEO James Valenzuela. Even though exports comprise 40% of total sales, Peru's mining sector is still key for their business and is seeing significant growth over the last months with the hike in base metal prices.

Resemin's Muki, an innovative 1.05 meter wide micro-jumbo, is used in narrow-vein operations in Peru and is already being sold in other countries. The company continues to expand its offering, having recently developed a scaler and a 1.30 meter wide bolter; yet Valenzuela assures that, after the Muki, the next transfor-

mational milestone will be Resemin's production of scoops, "a market three times the size of the jumbo business".

INNOVATION AS A PRE-REQUISITE

The competitive landscape in the mining market not only requires equipment to merely function, but also to add productivity to the clients' processes. These past years, with the dip in the market and with mining companies hesitant to purchase new equipment, providers needed to differentiate themselves and maintain their edge through innovation. In 2017, trends in the technology market include: the introduction of battery-powered machines;



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"Using battery power eliminates the need for diesel underground and the ventilation requirements that go with that. Most importantly for us, in the Andean region, is that electric motors do not suffer from inefficiencies like diesel engines do in high altitude. I imagine that, within five to 10 years, 50% of the products will be battery powered in Peru."

Brian Doffing, president surface and exploration drilling, Atlas Copco



the increased safety features of equipment; new maintenance tools to minimize downtime; and the continued tendency to achieve economies of scale, namely in very large open-pit operations.

Large OEMs, like Atlas Copco, are leading the charge in terms of the introduction of battery-powered equipment. While miners have seen mixed results with previous attempts to introduce this technology to their operations, Atlas Copco believes that the technology is already well developed and is bringing a battery scooptram to Peru this year.

Brian Doffing of Atlas Copco pointed out the advantages of the battery technology for underground operations: "Using battery power eliminates the need for diesel underground and the ventilation requirements that go with that. Most importantly for us in the Andean region is that

electric motors do not suffer from inefficiencies like diesel engines do at high altitude. I imagine that within five to 10 years, 50% of the products will be battery-powered in Peru. The equipment is more expensive, but the operating cost is much lower and that is the whole value argument." A key factor affecting underground mines is safety. As compared to open-pit, underground mines suffer from more accidents of personnel and more fatalities. While working on safe behavior and a safety culture within organizations is very important, developing new technologies is also a strategic step towards de-risking this type of mining activity. TUMI Raise Boring, for instance, developed raise boring technologies to drill ventilation holes and to do slot raises used in underground mining production. "We have had zero accidents in two years, because the machine is fully automated," assured Marc Blattner, general manager of TUMI.

An advertisement for Atlas Copco's ST7 battery-powered equipment. The background is a close-up of a yellow machine with a large blue battery pack. The battery pack has "ST7" and "BATTERY" written on it in large white letters. In the bottom left corner, there is a "DANGER HIGH VOLTAGE UNAUTHORIZED PERSONNEL KEEP OUT" warning sign. The text "HIGH QUALITY EFFICIENT SOLUTIONS" is written in blue. Below it, the text "Battery-powered. No emissions. No power cables. Safety, comfort and versatility." is written in blue. The website "www.atlascopco.com.pe" is listed in blue. The slogan "Sustainable Productivity" is written in black. The Atlas Copco logo is in the bottom right corner. A small image of a yellow battery-powered scooptram is shown in the center.



Photo courtesy of Austin Engineering.

"We have been pioneers in the development of large equipment for comminution processes. As volumes go up, you need to reduce the number of items, otherwise the processing plant becomes unmanageable. You cannot have 20 crushers, because you would need belts everywhere and the setup would be too spread-out."



Fernando Samanez,
VP sales mineral
processing solutions
Pacific Rim, Metso

MAXIMIZING PRODUCTION

Another driving force behind innovation in the mining equipment market is the phenomenon of operations increasing to an immense scale. Huge mines require the adequate size of equipment to support the operation, thus companies are launching larger equipment. In mining trucks, the 400-short ton Caterpillar or Liebherr models available can bring efficiencies to Peru's mega-projects. In terms of processing equipment, companies like Metso have been launching increasingly large models to guarantee the lower cost possible per metric ton processed. Fernando Samanez, VP sales mineral processing solutions for the Pacific Rim at Metso, explained: "As volumes go up, you need to reduce the number of items, otherwise the plant becomes unmanageable. You cannot have 20 crushers, because you would need belts everywhere and the setup would be too spread-out."

Samanez affirmed that Metso has been a pioneering company in the introduction of large-scale equipment, including the largest SAG mill in the world (42 feet) developed together with Newmont for the Conga project, which unfortunately never saw the light, and the world's largest secondary ball mill (30 feet).

Beyond the better use of space, another aspect where large equipment can bring cost savings to miners is energy usage. "4% of the world's energy consumption comes from comminution processes, which is huge," affirmed Samanez. "To achieve better efficiency, you have to use digitalization and automation to better use voltage peaks, while you also need to design equipment that is more energy-efficient."

Samanez gave the example of the vertical mill, such as Metso's VTM-7000, which uses 30-40% less energy than the equivalent ball mill.

NON-STOP PERFORMANCE

Time is money in the mining industry, and even more so as metal prices go up. Scheduled stops need to be as short as possible, while unscheduled stops have to be avoided at all costs. In Peru, with an installed capacity that has increased dramatically over the last years, specialized players have a great challenge to ensure the equipment's maximum availability.

Martin Engineering, a company dedicated to material handling solutions, recently launched two new developments contributing to better productivity. Eduardo Espinosa, commercial manager for the Andean region at Martin Engineering, gave more details: "On one side we launched the primary and secondary belt cleaners with *In-Line* technology, that allows for changes and repairs even with the belt in operation. The other solution is the CleanScrape, a cleaning kit for conveyors that includes tungsten carbide tips and is maintenance-free. We already have two CleanScrape kits working in Peru and four in Colombia."

Espinosa commented that there is a global trend in the market to promote the use of conveyor belt systems rather than mining trucks for the haulage of material. "Conveyor belts involve less people and present less risk, plus they generate fuel and power savings," he said.

This should ensure future growth for the company as new mines are built in the region.

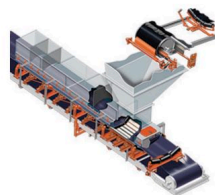
All in all, 2017 seems to be an exciting year for technology developments in the Peruvian mining industry. With the PERUMIN conference taking place in September, companies will be eager to present their latest developments to the public. Technological development and the Peruvian industry's adoption of innovation will help forge the path of mining going towards the future: as technologies evolve, so will the mines.



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MANEJO DE MATERIALES A GRANEL MÁS LIMPIO, SEGURO Y PRODUCTIVO

Mining Services

The market is not recovering for everyone yet, but the prospects are improving

With the uncertainties surrounding the general election and commodity prices, 2016 proved to be as equally stalled as 2015 for service companies. Therefore, the whole value chain has felt the market pressure to become the problem-solvers for the industry. Fortunately, company leaders can project some optimism, with businesses already picking up in market segments such as exploration, and better prospects for new project developments over the next months.

DRILLING

Geotec, a drilling contractor with more than 50 years of experience, has definitely felt the fresh start of 2017. Within the first month of the year, their fleet occupation has increased by 50% compared to 2016, and that is even more remarkable considering January is typi-

cally a slow month for drillers. "With certainty, this year the drilling market is going to expand by 30% to 40%, and the increment will be more acute in surface drilling, because in past years, 60% of the activity has centered around underground operations," commented Miguel Ángel Arenas, general manager of Geotec.

The company has recently incorporated six underground drilling rigs that are already working at Yanacocha. With more activity, the next natural step will be an increase in drilling rates, something that miners will try to delay as much as possible. According to Arenas, margins continue to be low and that is a challenge for providers: "To offer a world class service, you need an efficient organization with certifications for quality, safety, environmental care and social responsibility. Even if

there continues to be a pressure on rates to go down, we see new companies entering the market who probably do not realize the level of knowledge, safety, expertise and logistics required to fulfill the clients' objectives."

BLASTING

While many companies cut off exploration during the downturn, they could not stop production, so they put pressure on blasting solutions providers to bring rates down and have more productivity for lower costs. Short contracts, designed to keep a highly competitive market, means that explosives providers are participating in tenders pretty much all of the time: last year a large copper producer awarded a contract for just one year. "Our industry is still under pressure. Even if volumes have kept stable, the margins have decreased substantially," lamented Gustavo Gómez Sánchez, general manager of Exsa.

Exsa, a Peruvian blasting solutions provider, managed to keep a good position through the introduction of the Quantex technology for open pit mines at a moment when the market was demanding cost savings. Gómez Sánchez explained: "The Quantex technology allowed us to grow in volumes. We closed 2016 with a 47% market share in open pit mining. Pretty much all of that is with Quantex, which means that the market has transformed very quickly. Indeed, the traditional heavy ANFO had been the market standard for the previous 25 years."

Exsa is opening up an operation in Chile, where it plans to start testing the Quantex technology with open pit clients this year. The company is also ramping up production of initiation systems at their brand new plant in Lurín, south of Lima, with the idea of capturing significant market share in a business worth \$75 to \$80 million annually in Peru.

Other rock fragmentation companies in the market include local company Famesa, Enaex of Chile and Orica, a multi-national player with a significant participation in open pit mining operations in Peru, with contracts currently with Barrick, Cerro Verde and Las Bambas.

Asked about the search for efficiency, country manager of Orica, Gustavo Costa, said



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that choosing the right explosive can save significant costs to operators down the line, and gave the example of Orica's Vistan/Vistis 250, an aluminum-based product that is 2.5 times more powerful than the conventional product: "The better the rock fragmentation, the more efficient the mineral processing will be at the plant, with energy savings. Blasting energy is eight to 10 times cheaper than the energy used in grinding, but it is not always easy to pass that message along to mining companies," said Costa.

50% of Orica's revenue in Peru actually comes from the provision of cyanide, a business the company decided to keep when it sold its chemicals division. In terms of initiation systems, the company is launching a new wireless detonator, which Costa expects to have an impact in underground mining. Costa assures that, depending on the results of this year's tender processes, Peru could become the number one country for Orica in the region. In preparation for that, the company doubled its capacity at the Congata plant (Arequipa) last year.

LOGISTICS

Investments are a sign of a healing market, and mining service companies can expect increased growth as more mining projects become activated. However, mining companies do not want to deal with various providers to fulfill a required solution. Instead, they

value partners with a full-service offering. To compensate the lack of new project work, transportation and logistics company Stiglich expanded its services to assist clients on more fronts. They physically moved their operations to a 20,000 square meter facility, which includes 5,000 meters for storage and project cargo handling, and it currently offers general freight services, as well as the traditional oversized cargo services.

Carlos Roldán, general manager of Stiglich, commented that mining companies are not getting the most of their logistics chain: "Today, we have a buyers market, and this does not encourage mining companies to share their plans in advance. The demand-offer dynamics are like that, but with a more fluid collaboration, everyone across the value chain would benefit from increased efficiency."

Those who have seen many cycles will say that, once the market comes back, all the talk about efficiency will be gone because very few mining companies keep the financial discipline when they are just trying to grow and push production. Surely, while the beginning of 2017 has meant an upturn in business for mining services companies, the market is not at that level yet, so this year companies will have to keep a strong focus on operational efficiency and competitive rates, while they also prepare for increased market demand, hopefully very soon.

"Most of our open-pit clients have switched to Quantex, which means that the market has transformed very quickly. The traditional heavy ANFO had been the market standard for the previous 25 years."

Gustavo Gómez Sánchez, general manager, EXSA



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"Peru is unique in that it has mining reserves for the next 200 years"

Could you provide some insight into Peru's participation in the 2017 PDAC Convention?

Our main goal for PDAC 2017 is to attract investment into Peru. The country has all the features of an attractive investment destination, and last year's election results added certainty to Peru's mining sector as well as the policy surrounding the industry for the coming years. Additionally, commodity prices are higher than last year and will continue to rise throughout 2017, opening the door to new investment. On the social front, the country has also made significant strides by implementing improvements. This year Peru will once again be a country sponsor for PDAC. We will host a "Peru Day" during the conference where we will present Peru's vision of mining for the years to come. We are confident that PDAC will be a significant platform to showcase Peru's mining sector as a hotspot for investment.

What are some of Peru's competitive advantages as a mining country?

Peru is unique in that it has mining reserves for the next 200 years. The country's mines are relatively young, and there are several significant medium-sized mining projects in the pipeline. Furthermore, Peru has always had lower extraction costs as compared to other countries. Therefore, when mineral prices decrease around the world, Peru's lower operating costs allow it to continue to produce at a profit.

What is the new government's strategy to improve community relations and simplify the permitting processes?

The current administration is focused on promoting social peace. President Kuczynski understands the necessity for

more development projects, including endeavors to provide access to clean water and sanitation systems. In order to facilitate communication and negotiation with the communities surrounding mining projects, such development work is imperative. Many within these communities are frustrated as a result of their basic needs being neglected by previous administrations.

Due to the absence of government action in the past, many mining companies have filled in and invested in local development projects.

On the environmental side, Kuczynski's government has significantly simplified bureaucratic processes. The former minister's policies and standards resulted in stalling investment for the Peruvian mining industry. Although environmental standards are vital, excessive regulation results in stagnation. Fortunately, the current government ministers are actively involved in supporting mining companies to more easily obtain permits and move forward with projects, which will in turn spark foreign investment in the near future.

What is your final message in regards to the Peruvian delegation at the PDAC Convention?

Canada is an important ally for Peru with a sophisticated mining sector. From training world-class professionals to implementing innovative technologies, Peru has various lessons to learn from Canada's mining industry. Canada leads as an example of how mining can catalyze overall economic growth and development. Through closer alliances with the Canadian mining industry, we can realize the opportunities for the sector in Peru.

This publication is a pre-release edition of GBR's full special report on Peruvian mining, that will be published in Q3 2017.

If you wish to be interviewed for the report, please contact Imara Salas (isalas@gbreports.com)

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