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As filed with the Securities and Exchange Commission on April 3, 2019.

UNITED STATES SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

Form 20-F

**ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d)
OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended: December 31, 2018
Commission file number: 001-38256

NEXA RESOURCES S.A.

(Exact name of Registrant as specified in its charter)

Grand Duchy of Luxembourg

(Jurisdiction of incorporation or organization)

Rodrigo Nazareth Menck
Senior Vice President Finance and Group Chief Financial Officer
Phone: +352 28 26 37 27
37A, Avenue J.F. Kennedy
L-1855, Luxembourg
Grand Duchy of Luxembourg
(Address of principal executive offices)

Securities registered or to be registered pursuant to Section 12(b) of the Act:

Title of Each Class	Name of Each Exchange on Which Registered
Common shares, each with par value of US\$1.00	New York Stock Exchange
Securities registered or to be registered pursuant to Section 12(g) of the Act: None	
Securities for which there is a reporting obligation pursuant to Section 15(d) of the Act: None	
The number of outstanding shares of each class of stock of Nexa as of December 31, 2018 was: 133,208,125 common shares, each with par value of US\$1.00	

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.

Yes No

If this report is an annual or transition report, indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934.

Yes No

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports) and (2) has been subject to such filing requirements for the past 90 days.

Yes No

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files).

Yes No

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer or an emerging growth company. See definition of "accelerated filer," "large accelerated filer" and "emerging growth company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer Accelerated filer Non-accelerated filer Emerging growth company

If an emerging growth company that prepares its financial statements in accordance with U.S. GAAP, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

Indicate by check mark which basis of accounting the registrant has used to prepare the financial statements included in this filing:

U.S. GAAP International Financial Reporting Standards as issued
by the International Accounting Standards Board Other

If "Other" has been checked in response to the previous question, indicate by check mark which financial statement item the registrant has elected to follow.

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If this is an annual report, indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act).

Yes No

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FORWARD-LOOKING STATEMENTS

This annual report includes statements that constitute estimates and forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, or Securities Act, and Section 21E of the Securities Exchange Act, as amended, or Exchange Act. The words "believe," "will," "may," "may have," "would," "estimate," "continues," "anticipates," "intends," "plans," "expects," "budget," "scheduled," "forecasts" and similar words are intended to identify estimates and forward-looking statements. Estimates and forward-looking statements refer only to the date when they were made, and we do not undertake any obligation to update or revise any estimate or forward-looking statement due to new information, future events or otherwise, except as required by law. Estimates and forward-looking statements involve risks and uncertainties and do not guarantee future performance, as actual results or developments may be substantially different from the expectations described in the forward-looking statements.

These statements appear in a number of places in this report and include statements regarding our intent, belief or current expectations, and those of our officers and employees, with respect to, among other things: (i) our future financial or operating performance; (ii) our growth strategy; (iii) future trends that may affect our business and results of operations; (iv) the impact of competition and applicable laws and regulations on our results; (v) planned capital investments; (vi) future of zinc or other metal prices; (vii) estimation of mineral reserves; (viii) mine life; and (ix) our financial liquidity.

Forward-looking statements are not guarantees of future performance and involve risks and uncertainties. Actual results and developments may be substantially different from the expectations described in the forward-looking statements for a number of reasons, many of which are not under our control, among them the activities of our competition, the future global economic situation, weather conditions, market conditions, exchange rates, and operational and financial risks. The unexpected occurrence of one or more of the abovementioned events may significantly change the results of our operations on which we have based our estimates and forward-looking statements. Our estimates and forward-looking statements may be influenced by the following factors, including, among others:

- the cyclical and volatile prices of the metals we produce;
 - the changes in the supply and demand for the metals we produce;
 - the risks and uncertainties relating to Peruvian and Brazilian economic and political conditions;
 - changes in global economic market conditions;
 - operational risks, such as operator errors, mechanical failures and other accidents;
 - the availability of materials, supplies, insurance coverage, equipment, required permits or approvals and financing;
 - substantial capital expenditures requirements and risks associated with such capital expenditures;
 - the timing and amount of estimated future production and cost of production;
 - currency exchange rate fluctuations;
 - failure to obtain financial assurance to meet closure and remediation obligations;
 - the possible material differences between our estimates of mineral reserves and the mineral quantities we actually recover;
 - the cost and timing of the development of new deposits, future exploration and/or exploitation;
 - our concessions may be terminated or not renewed by governmental authorities;
-

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Forward-Looking Statements

- changes in Peruvian, Brazilian and international governmental and regulatory policies that apply to our operations; and
- other factors discussed under “Risk Factors.”

In light of the risks and uncertainties described above, the events referred to in the estimates and forward-looking statements included in this report may or may not occur, and our business performance and results of operation may differ materially from those expressed in our estimates and forward-looking statements, due to factors that include but are not limited to those mentioned above.

These forward-looking statements are made as of the date of this report, and we assume no obligation to update them or revise them to reflect new events or circumstances. There can be no assurance that the forward-looking statements will prove to be accurate, as actual results and future events could differ materially from those anticipated in such statements.

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PRESENTATION OF FINANCIAL AND OTHER INFORMATION

Certain definitions

Unless otherwise indicated or the context otherwise requires, the terms below are defined in the following manner.

- The “Company,” “we,” “us” and “our” or similar terms refer to Nexa Resources and its consolidated subsidiaries;
- “Nexa Resources” refers to Nexa Resources S.A., a Luxembourg public limited liability company (*société anonyme*);
- “Nexa CJM” refers to our subsidiary Nexa Resources Cajamarquilla S.A. (previously known as Votorantim Metais—Cajamarquilla S.A.), a corporation organized as a *sociedad anónima* under the laws of Peru;
- “Nexa Brazil” refers to our subsidiary Nexa Recursos Minerais S.A. (previously known as Votorantim Metais Zinco S.A.), a corporation organized as a *sociedade anônima* under the laws of Brazil;
- “Nexa Peru” refers to our subsidiary Nexa Resources Peru S.A.A. (previously known as Compañía Minera Milpo S.A.A.), a corporation organized as a *sociedad anónima abierta* under the laws of Peru and publicly traded on the Lima Stock Exchange;
- “Enercan” refers to our subsidiary Campos Novos Energia S.A., a corporation organized as a *sociedade anônima* under the laws of Brazil;
- “VUS” refers to our subsidiary Votorantim US, Inc., a corporation organized under the laws of Delaware. VUS was renamed Nexa Resources US, Inc. on December 5, 2018;
- “VSA” refers to our shareholder Votorantim S.A., a corporation organized as a *sociedade anônima* under the laws of Brazil;
- the “Votorantim Group” refers to VSA and its subsidiaries;
- the “*real*,” “*reais*” or “R\$” refers to the Brazilian *real*, the official currency of Brazil;
- “*sol*,” “*soles*” or “S/.” refers to the Peruvian *sol*, the official currency of Peru; and

In addition, the meaning of other defined terms used in this report are set out in “Glossary.”

Financial information

Our consolidated financial statements as of December 31, 2018 and 2017 and for each of the years ended December 31, 2018, 2017 and 2016 are included in this annual report. Our consolidated financial statements are prepared in accordance with International Financial Reporting Standards as issued by the International Accounting Standards Board, or IFRS. References in this report to “our consolidated financial statements” are to our consolidated financial statements as of December 31, 2018 and 2017 and for each of the years ended December 31, 2018, 2017 and 2016, and the related notes thereto included elsewhere in this report.

The financial information presented in this report should be read in conjunction with our consolidated financial statements, including the related notes, and the section of this report titled “Operating and financial review and prospects.”

The main consolidated companies included in our consolidated financial statements are:

- **Nexa CJM** — a Peruvian company mainly engaged in smelting zinc contained in concentrate. Nexa CJM’s functional currency is the U.S. dollar.

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Presentation of Financial and Other Information

- **Nexa Peru** — a Peruvian company mainly engaged in exploring, extracting, producing and trading zinc, copper and lead concentrates, extracted from its own three mining sites. Nexa Peru's functional currency is the U.S. dollar. Nexa Peru is a public company with its shares listed on the Lima Stock Exchange.
- **Nexa Brazil** — a Brazilian company mainly engaged in exploring, extracting and producing zinc, copper and lead concentrates, and smelting zinc contained in concentrate with operations in the state of Minas Gerais. Nexa Brazil's functional currency is the *real*.

Non-IFRS measures

Our management uses non-IFRS measures such as Adjusted EBITDA and cash cost, among other measures, for internal planning and performance measurement purposes. We believe these measures provide useful information about the financial performance of our operations that facilitates period-to-period comparisons on a consistent basis. Management uses Adjusted EBITDA internally to evaluate our underlying operating performance for the reporting periods presented and to assist with the planning and forecasting of future operating results. Management believes that Adjusted EBITDA is a useful measure of our performance because it reflects our cash generation potential from our operational activities excluding exceptional items of the period. These measures should not be considered individually or as a substitute for net income or operating income, as indicators of operating performance, or as alternatives to cash flow as measures of liquidity. Additionally, our calculation of Adjusted EBITDA and other non-IFRS measures may be different from the calculation used by other companies, including our competitors in the mining industry, so our measures may not be comparable to those of other companies. See "Selected financial data" for a discussion of our use of non-IFRS measures in this report, including the reasons why we believe this information is useful to management and to investors, and a reconciliation to the comparable IFRS measures.

Country, market and industry information

This report contains and refers to information and statistics regarding Brazil, Peru and the markets for the metals we produce. This data is obtained from independent public sources, including publications and materials from participants in the industry, such as Wood Mackenzie and from governmental entities such as the Brazilian Central Bank, Brazilian Ministry of Treasury (*Ministério da Fazenda*), Brazilian Ministry of Mines and Energy (*Ministério de Minas e Energia* or MME), (Center of Custody and Financial Settlement of Securities CETIP S.A.—*Mercados Organizados* or CETIP), Brazilian Institute of Geography and Statistics (*Instituto Brasileiro de Geografia e Estatística*), or IBGE, the Getulio Vargas Foundation (*Fundação Getúlio Vargas*), or FGV, the Peruvian Insurance and Private Pension Funds Supervision Authority (*Superintendencia de Banca, Seguros y Administradoras de Fondos de Pensiones—AFP*), the Peruvian Central Bank, the Peruvian Ministry of Economy and Finance (*Ministerio de Economía y Finanzas*) and the Peruvian Ministry of Energy and Mines (*Ministerio de Energía y Minas* or MINEM). Some data is also based on our estimates, which are derived from our review of internal reports, as well as independent sources.

Volume information

All tonnage information in this report is expressed in metric tonnes, and all references to ounces are to troy ounces, in each case, unless otherwise specified.

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RISK FACTORS

Business risks

Our business is highly dependent on the international market prices of the metals we produce, which are both cyclical and volatile.

Our business and financial performance is significantly affected by the market prices of the metals we produce, particularly the market prices of zinc, copper, silver, lead and, to a lesser extent, gold. Historically, prices of such metals have been subject to wide fluctuations and are affected by numerous factors beyond our control, including international economic and political conditions, the cyclical nature of consumption, actual or perceived changes in levels of supply and demand, the availability and costs of substitutes, inventory levels maintained by users, actions of participants in the commodities markets and currency exchange rates. We cannot predict whether, and to what extent, metal prices will rise or fall in the future.

Future declines in metal prices, and especially zinc, copper, silver and lead prices, could have an adverse impact on our results of operations and financial position, and we might consider curtailing or modifying certain operations. In addition, we may not be able to adjust production volume in a timely or cost-efficient manner in response to changes in metal prices. Lower utilization of capacity during periods of weak prices may expose us to higher unit production costs since a significant portion of our cost structure is fixed in the short-term due to the high capital intensity of mining operations. Conversely, during periods of high prices, our ability to rapidly increase production capacity may be limited, which could prevent us from selling more products. Moreover, we may be unable to complete expansions and greenfield projects in time to take advantage of rising prices for zinc, copper, lead or other products.

Changes in the demand for the metals we produce could adversely affect our sales volume and revenues.

Our revenues depend on the volume of metals we sell (and, to a lesser extent, the volume of metals produced by others that are smelted in our facilities), which in turn depend on the level of industrial and consumer demand for these metals. An increase in the production of zinc, copper, silver and lead worldwide or changes in technology, industrial processes or consumer habits, including increased demand for substitute materials, may decrease the demand for these metals. A fall in demand, resulting from economic slow-downs or other factors, could also decrease the volume of metals we sell and therefore materially adversely impact our results of operations and financial position.

Our business, financial position and results of operations may be adversely affected by inflation.

Brazil has historically experienced high rates of inflation. Inflation rates were 7.2% in 2016, -0.5% in 2017 and 7.5% in 2018, as measured by the General Market Price Index. Brazil may experience high levels of inflation in the future, which may impact domestic demand for our products. Inflationary pressures may also curtail our ability to access international financial markets and may lead to further government intervention in the economy, including the introduction of government policies that may materially adversely affect the overall performance of the Brazilian economy, which in turn may materially adversely affect us. In addition, we may not be able to adjust the prices we charge our customers to offset the effects of inflation on our cost structure.

Peru experienced periods of hyperinflation in the 1980s and high inflation in the early 1990s. In recent years, inflation has been relatively low, with an average annual inflation rate between 2013 and 2018 of 2.9% as measured by the Peruvian Consumer Price Index. If Peru experiences significant rates of inflation in the future, the economy could be adversely affected. Although the functional currency for our Peruvian operations is the U.S. dollar, high rates of inflation could increase our operating costs and adversely impact our operating margins if we are not able to pass the increased costs on to consumers.

Our results and financial position are affected by the cyclical nature of global economic activity.

The mining industry has historically been highly volatile largely due to the cyclical nature of the industrial production, which affects the demand for minerals and metals. Demand for minerals and metals thus generally correlates to macroeconomic fluctuations in the global economy. For example, this correlation and the adverse effect

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Risk Factors

of macroeconomic downturns on metal mining companies were evidenced in the 2008/2009 financial and subsequent economic crisis. Economic growth (and minerals demand) trends have varied across such markets since such period.

Interruptions of energy supply or increases in energy costs may materially adversely affect our results of operations and financial position.

We require substantial amounts of electricity for our operations. In Peru, we obtain electric power for our operations from third parties through electricity supply contracts. In the event of any interruption or failure of our sources of electricity or failures or congestion in any part of the SEIN (*Sistema Eléctrico Interconectado Nacional*) or any failure to renew or extend our existing electricity supply contracts, we cannot assure shareholders that we will have access to other energy sources in Peru at the same prices and conditions.

In Brazil, we obtain electric power for our operations from hydroelectric plants grouped into several legal entities—which are directly or indirectly jointly owned by us, our controlling shareholder and its affiliates—pursuant to long-term power purchase agreements with fixed prices for ten years. Although these hydroelectric plants provide 100.0% of the estimated consumption of electricity, and prices are fixed for the medium term, any unavailability or shortages of electrical power or other energy sources and interruptions of energy supply may have a material adverse impact on our results of operations. Furthermore, our energy costs could increase in the event of differences in the hydrology forecast due to these hydroelectric plants paying additional levies. For more information, see “Other operations—Hydroelectric plants—Brazil.”

The prices for and availability of energy resources for our operations may be subject to change or curtailment due to, among other things, new laws or regulations, the imposition of new taxes or tariffs, supply interruptions, equipment damage, worldwide price levels, market conditions and any inability to renew our existing supply contracts. Disruptions in energy supply or increases in costs of energy resources could have a material adverse effect on our financial position and results of operations.

The mining industry is highly competitive.

We face competition from other mining, processing, trading and industrial companies in Brazil, Peru and around the world. Competition principally involves the following factors: sales, supply and labor prices; contractual terms and conditions; attracting and retaining qualified personnel; and securing the services, supplies and technologies we need for our operations. Slower development in technology and innovation could impact costs, productivity and competitiveness. In addition, mines have limited lives and, as a result, we must seek to replace and expand our mineral reserves by acquiring new properties. Significant competition exists to acquire mining concessions, land and related assets. We cannot assure shareholders that competition will not adversely affect us in the future.

The international trade environment faces increasing uncertainty. Potential changes to international trade regulations and agreements, as well as other political and economic arrangements (including direct or indirect subsidies), may benefit competitors operating in countries other than where our mining operations are currently located. These changes could also adversely affect the prices we pay for the supplies we need and our export costs when we engage in international transactions. We cannot assure shareholders that we will be able to compete based on price or other factors with companies that in the future may benefit from favorable regulations, trading or other arrangements or that we will be able to maintain the cost of the supplies that we require as well as our export costs.

Operational risks

The mining business is subject to inherent risks, some of which are not insurable.

The business of mining zinc, copper, silver, lead and other minerals is generally subject to numerous risks and hazards. Hazards associated with underground mining operations include underground fires and explosions, including those caused by flammable gas, gas and coal outbursts, cave-ins or falls of ground, rock falls, openings collapse, lack of oxygen, air pollution, discharges of tailings, hazardous substances and materials, gases and toxic chemicals, water ingress and flooding, sinkhole formation, ground subsidence, and other accidents and conditions resulting from underground mining activities, such as drilling, blasting, removing and processing material. In

addition, we may encounter geotechnical challenges as we continue with and expand our mining activities, including the possibility of failure of underground openings. We could incur additional expenses in connection with preventive and remediating measures related to underground openings, which could materially adversely affect results of our operations and financial position.

Such occurrences could result in damage to, or destruction of, our properties or production facilities, third-party property, human exposure to pollution, personal injury or death, environmental and natural resource damage or contamination, delays in mining, monetary losses and legal liability. In addition, any such occurrences could adversely affect our reputation. Damages to our reputation could result in additional environmental and health and safety legal oversight, and authorities could impose more stringent conditions in connection with the licensing process of our projects and operations. In addition, our customers may be less willing to buy metals from us if we have been subject to significant adverse publicity. We maintain insurance typical in the mining industry, and in amounts that we believe to be adequate, but which may not provide complete coverage in certain circumstances. Insurance against certain risks (including certain liabilities for environmental contamination and other hazards as a result of exploration and production) is not generally available or is uneconomical to afford. We could also incur additional expenses due to failures in our industrial drainage system or other environmental control equipment.

We may be materially adversely affected by challenges relating to slope and stability of underground openings.

Our underground mines get deeper and our waste and tailings deposits increase in size as we continue with and expand our mining activities. This presents certain geotechnical challenges, including the possibility of failure of underground openings. If we are required to reinforce such openings or take additional actions to prevent such a failure, we could incur additional expenses, and our operations and stated mineral reserves could be negatively affected. We have taken actions we consider appropriate to maintain the stability of underground openings, but additional actions may be required in the future. Unexpected failures or additional requirements to prevent such failures may materially adversely affect our costs and expose us to health, safety and other liabilities in the event of an accident. These developments may in turn materially adversely affect the results of our operations and financial position, as well as potentially diminish our stated mineral reserves.

Our projects are subject to operational risks that may result in increased costs or delays that prevent their successful implementation.

We invest in increasing our mine and metal production capacity and developing new operations. Our projects are subject to several risks that may materially adversely affect our growth prospects and profitability, including the following:

- we may encounter delays or higher than expected costs in obtaining the necessary equipment, machinery, materials, supplies, labor or services and in implementing new technologies to develop and operate a project;
- we may experience delays in commencing the operations of a new project or the expansion of an existing operation;
- our efforts to develop projects according to schedule may be hampered by a lack of infrastructure, including a reliable power supply;
- we may fail to obtain, or experience delays or higher than expected costs in obtaining, the required agreements, authorizations, licenses, approvals and permits to develop a project, including the prior consultation procedure and agreements with local communities;
- changes in market conditions or regulations may make a project less profitable than expected at the time we initiated work on it;
- accidents, natural disasters, labor disputes and equipment failures;
- adverse mining conditions may delay and hamper our ability to produce the expected quantities and

qualities of minerals upon which the project was budgeted;

- mineral reserves are estimates based on the interpretation of limited sampling data and testwork that may not be representative of the deposits as a whole, or the technical and economic assumptions used in the estimates may prove to be materially different when the deposits are mined, that could result in materially different economic outcomes, and
- conflicts with local communities and/or strikes or other labor disputes may delay the implementation or the development of projects.

Certain of our current operations, projects and prospects are in remote areas, and our production, processing and product delivery rely on adequate and available infrastructure and skilled labor.

Our mining, smelting, processing, development and exploration activities depend to a large degree on adequate infrastructure. The regions where certain of our current operations, projects and prospects are located are sparsely populated and difficult to access. We require reliable roads, bridges, power sources and water supplies to access and properly conduct our operations. As a result, the availability and cost of this infrastructure affects capital and operating costs and our ability to maintain expected levels of production and sales. We could also experience an increase in transit-related accidents due to the need to transport employees to remote areas. Unusual weather, such as the excessive rains and flooding that occurred in Peru in 2017, or other natural phenomena, sabotage, government or external interference in the maintenance or provision of such infrastructure could impact the development of a project, reduce mining volumes, increase mining or exploration costs or delay the transportation of raw materials to the mines and projects or concentrates to the customers. See “—Natural disasters, such as floods, mudslides and earthquakes, and the impact of climate change could damage our facilities.”

In addition, the mining industry is labor-intensive, and our success depends to a significant extent on our ability to attract, hire, train and retain qualified employees, including our ability to attract employees with the necessary skills in the regions in which we operate. We could experience increases in our recruiting and training costs and decreases in our operating efficiency, productivity and profit margins if we are unable to attract, hire and retain a sufficient number of skilled employees to support our operations.

The failure of a tailings dam could negatively impact our business, reputation and results of operations.

Mining companies face inherent risks in their operations of tailings dams—structures built for the containment of the metals and mining waste, known as tailings—which exposes us to certain risks.

On January 25, 2019, there was a tragic failure of a tailings dam in the city of Brumadinho, in the state of Minas Gerais, Brazil. The Brumadinho dam was built using the upstream method and belongs to Vale S.A. The causes of its failure are not yet known. Another upstream-method tailings dam in Brazil, the Fundão tailings dam owned by Samarco Mineração S.A., failed in November 2015. Each of these failures released muddy tailings downstream, flooded certain communities, caused fatalities and resulted in extensive environmental damage to the surrounding area.

The 2015 Fundão dam failure resulted in the immediate suspension of Samarco Mineração S.A.’s mining operations by government authorities and caused that company to incur significant expenses—including monetary fines and costs in connection with civil and criminal proceedings—write off assets and recognize provisions for remediation, which affected its balance sheet and income statement. The consequences of the 2019 Brumadinho dam failure are still developing. As of the date of this report, state authorities in Minas Gerais, where our Brazilian operations are located, have prohibited licensing dams that use the upstream method. New regulations have also been enacted in Brazil, which could result in more restrictions and/or higher costs for the operation of existing dams or require the decommissioning of tailings dams where communities are established within areas encompassing the portion of the valley downstream of the dam. For more information see “Information on the Company—Regulatory matters—Brazilian regulatory framework—Environmental regulations—Regulation of dams.”

As a mining company, we face inherent risks in disposing of waste, particularly in using tailings dams. Our tailings dams include, in some cases, materials with high toxicity, which increases the hazard potential in the event of unexpected failure. If any such risks were to occur, this could materially adversely affect our reputation and our

ability to conduct our operations and could make us subject to liability and, as a result, have a material adverse effect on our business, financial position and results of operations. In addition, the changes in regulation that may occur as a result of the Brumadinho dam failure could increase the time and costs to build, operate, inspect, maintain and decommission tailings dams, obtain new licenses or renew existing licenses to build tailings dams, or require the use of new technologies. New regulations may also impose more restrictive requirements that may exceed our current standards, including mandated compliance with emergency plans and increased insurance requirements, or require us to pay additional fees or royalties to operate tailings dams. We may also be required to provide for and facilitate the relocation of communities and facilities impacted by tailings dam failures. For more information see “Information on the Company—Mining operations—Tailings disposal.”

A disruption in zinc concentrate supply could have a material adverse effect on our production levels and financial results.

A portion of the zinc concentrate used by our smelters is obtained from third parties, and we may be adversely affected if we are not able to source adequate supplies of zinc for such operations. In 2018, 42.0% of the zinc concentrate used by our smelters was obtained from third parties, with the remainder supplied by our own mining operations. The availability and price of zinc concentrate used by our smelters may be negatively affected by several factors largely beyond our control, including interruptions in production in our mines or by our suppliers, decisions by suppliers to allocate supplies of concentrate to other purchasers, price fluctuations and increasing transport cost. In addition, the efficiency of a smelter’s production over time is affected by the mix of the zinc concentrate qualities it processes. In circumstances where we cannot source adequate supplies of the zinc concentrate qualities that comprise the most efficient mix for our smelters, alternative types of concentrate may be available, but the use thereof may increase our costs of production or reduce the productivity of our smelters and adversely affect our business, results of operations and financial position.

Inadequate supply of zinc secondary feed materials and zinc calcine could affect the results of our smelters.

Zinc sourced from suppliers of secondary feed materials represented approximately 19.8% of the zinc content used by our Juiz de Fora smelter in 2018. The use of zinc secondary feed material is a comparative advantage in relation to the use of zinc concentrate, mainly due to lower acquisition costs and, to a lesser extent, operational gains. In addition, we have recently incorporated zinc calcine processed by third parties into our operations to increase the production in our smelters. Our smelters then use this zinc calcine processed by third parties to produce additional refined zinc products that they would not produce were they to rely solely on other inputs. To the extent we are unable to obtain adequate supplies of zinc secondary feeds or zinc calcine, or if we must pay higher than anticipated prices of these inputs, our business, results of operations and financial position may be adversely affected.

Shortages of water supply, explosives, critical spare parts, maintenance service and new equipment and machinery may materially adversely affect our operations and development projects.

Our mining operations require the use of significant quantities of water for extraction activities, processing and related auxiliary facilities. Water usage, including extraction, containment, and recycling requires appropriate permits, which are granted by regulatory authorities in Brazil and Peru. The available water supply may be adversely affected by shortages or changes in governmental regulations. We cannot assure that water will be available in sufficient quantities to meet our future production needs or will prove sufficient to meet our water supply needs. In addition, we cannot assure shareholders that we will maintain our existing licenses related to water rights. A reduction in our water supply could materially adversely affect our business, results of operations and financial position. In addition, we have not yet obtained the water rights to support some of our expansion projects, and our inability to obtain those rights could prevent us from pursuing those expansions.

In addition to water, our mining operations require intensive use of equipment and machinery as well as explosives. To be able to acquire and use explosives, we must first obtain the corresponding authorizations, which are granted by the relevant regulatory authorities in Brazil and Peru. A shortage in the supply of key spare parts, adequate maintenance service, new equipment and machinery to replace old ones and cover expansion requirements, or explosives, including due to the inability to deliver such water, energy, supplies, critical spare parts, explosives, or equipment and machinery to our operations, could materially adversely affect our operations and development projects.

We may be adversely affected by labor disputes.

Mining is a labor-intensive industry. We depend on more than 12,000 workers, including employees and contractors, to carry out our operations. A portion of our employees are unionized. We cannot assure shareholders that we will not experience work slowdowns, work stoppages, strikes or other labor disputes in the future, particularly in the context of the annual renegotiation of our collective bargaining agreements.

We may also be affected by labor-related disputes that broadly develop in the countries in which we operate. In May 2018, a ten day nationwide truck drivers' strike resulted in an interruption in the supply of raw materials, which temporarily affected the Três Marias smelter. Production at the Três Marias smelter has since been normalized. Strikes and other labor disruptions at any of our operations could have a material adverse effect on our business, financial position and results of operations.

We may be liable for certain payments to individuals employed by third-party contractors.

Under Peruvian law, outsourcing of employees from third-party contractors is permitted if certain requirements are met. To the extent that such requirements are not met, we may be jointly liable for all mandatory employment benefits and may be required to pay workers used under an outsourcing scheme with profit-sharing benefits as if they were employed directly by us. Moreover, we may be required to consider such persons employed by third-party contractors as our employees. Although we believe that we are in material compliance with Peruvian labor laws, we cannot assure shareholders that any proceedings initiated by outsourced employees will be resolved in our favor and that we will not be liable for any mandatory employment benefits or for profit-sharing benefits. See "Regulatory matters—Peruvian regulatory framework."

Under Brazilian law, outsourcing is also permitted if certain requirements are met. In addition, Brazilian law provides that the contractor will be held liable on a secondary basis if the outsourced or subcontracted companies do not fulfill their labor obligations. In cases where the outsourced or subcontracted companies do not pay the workers the labor sums they are entitled to, the contractor is responsible for those payments. These payments may have an adverse effect on our results of operation and financial position. Recent changes to Brazilian labor laws have affected outsourcing, and we cannot predict how these changes will be further regulated and applied by local authorities and interpreted by Brazilian labor courts. If outsourcing becomes more restrictive or costly because of these new laws, our cash flow may be reduced, affecting our financial position and results of operations. See "Regulatory matters—Brazilian regulatory framework."

We may be subject to misconduct by our employees or third-party contractors.

We may be subject to misconduct by our employees or third-party contractors, such as theft, bribery, sabotage, fraud, insider trading, violation of laws, slander or other illegal actions. Any such misconduct may lead to fines or other penalties, slow-downs in production, increased costs, lost revenues, increased liabilities to third parties, impairment of assets or harmed reputation, any of which may have a material adverse effect on our business, results of operations or financial position.

The nature of our business includes risks related to litigation and administrative proceedings that could materially adversely affect our business and financial performance in the event of unfavorable rulings.

The nature of our business exposes us to various litigation matters, including civil liability claims, environmental matters, health and safety matters, regulatory and administrative proceedings, governmental investigations, tort claims, contract disputes, labor matters and tax matters, among others. We cannot assure shareholders that these or other legal proceedings will not have a material adverse effect on our ability to conduct our business or on our financial position and results of operations, through distraction of our management team, diversion of resources or otherwise. In addition, although we establish provisions as we deem necessary in accordance with IFRS as issued by the IASB, the amount of provisions that we record could vary significantly from any amounts we actually pay, due to the inherent uncertainties in the estimation process.

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Risk Factors

We could be harmed by a failure or interruption of our information technology systems or automated machinery, including system security breaches or other cybersecurity attacks.

We rely on our information technology systems and automated machinery to effectively manage our production processes and operate our business. Any failure of our information technology systems and automated machinery to perform as we anticipate could disrupt our business and result in production errors, processing inefficiencies and the loss of sales and customers, which in turn could result in decreased revenue, increased overhead costs and excess or out-of-stock inventory levels resulting in a material adverse effect on our business results.

In recent years, cyberattacks and other tactics designed to gain access to and exploit sensitive information by breaching mission critical systems of large organizations have increased in volume and sophistication. We are dependent on internal information, and we are vulnerable to failure of these systems, including through system security breaches, data protection breaches or other cybersecurity attacks. We could be exposed to a cyberattack through an internal breach from servers connected to our internal network or an external breach due to disruptions from unauthorized access to our systems, which could impact our ability to operate our existing systems. If these events occur, including a cyberattack causing critical data loss or the disclosure or use of confidential information, the exposure of such information could have a material adverse effect on our reputation and market value, which could adversely impact our results of operations.

In addition, data privacy is subject to frequently changing rules and regulations. The European Union's General Data Protection Regulation, or GDPR, took effect on May 25, 2018 and introduced increased regulations relating to personal data security. The GDPR requires companies to satisfy new requirements regarding the handling of personal and sensitive data, including its use, protection and the ability of persons whose data is stored to correct or delete such data about themselves. On August 14, 2018, the Brazilian president signed Law No. 13,709 (*Lei Geral de Proteção de Dados*), or LGPD, a comprehensive data protection law. The LGPD establishes detailed rules for the collection, use, processing and storage of personal data and is expected to affect all economic sectors, including the relationship between customers and suppliers of goods and services, employees and employers and other relationships in which personal data is collected, whether in a digital or physical environment. The LGPD is expected to take effect within 24 months from the date of publication of the law. Any noncompliance with the GDPR, the LGPD or any other cybersecurity and data privacy regulations could result in proceedings or actions against us by governmental entities, the imposition of fines or penalties and damage to our reputation, which could have an adverse effect on us and our business, reputation and results of operations.

Financial risks

Our financial position and results of operations may be materially adversely affected by currency exchange rate fluctuations.

Our revenues are primarily denominated in U.S. dollars, and certain portions of our operating costs, principally labor costs, are denominated in *reais* and *soles*. Accordingly, when inflation in Brazil and Peru increases without a corresponding devaluation of the *real* or *sólido*, our financial position, results of operations and cash flows could be materially adversely affected.

Given the structure of our operations, a decrease in the value of the U.S. dollar relative to the foreign currencies in which we incur costs generally could have a negative impact on our results of operations or financial position. Our foreign currency exposures increase the risk of volatility in our financial position, results of operations and cash flows. We cannot assure shareholders that currency fluctuations, or costs associated with our hedging activities (including fluctuations in exchange rates contrary to our expectations), will not have an impact on our financial position and results of operations.

Fluctuations in interest rates in Brazil could increase the cost of servicing our debt and negatively affect our overall financial performance.

Some of our indebtedness bears interest based on variable interest rates, including the London Interbank Offered Rate, or LIBOR. Such variable rates have fluctuated in response to changes in economic growth, monetary policy and governmental regulation. A significant increase in underlying interest rates, particularly in LIBOR, could

have a material adverse effect on our financial expenses and materially adversely affect our overall financial performance. In July 2017, the Financial Conduct Authority announced its intention to phase out LIBOR by the end of 2021. It is not possible to predict the effect of any changes in the methods by which LIBOR is determined or regulatory activity related to LIBOR's phase out. Any of these developments could cause LIBOR to perform differently than in the past or cease to exist. There is a possibility that the Secured Overnight Financing Rate, or SOFR, could replace LIBOR. SOFR, which is based on transactions in the U.S. treasury repurchase market, may deviate significantly from LIBOR, and could have a material adverse effect on our financial investments and LIBOR-linked indebtedness. We may also have to amend our debt instruments to reflect the change from LIBOR to SOFR. In addition, some of our financial investments bear interest on variable interest rates, including LIBOR and the Interbank Deposit Certificate (*Certificado de Depósito Interbancário*), or CDI rate. A significant reduction in the CDI rate and/or LIBOR could materially adversely impact the financial income that we derive from our investing activities. The CDI rate has fluctuated significantly in the past due to the impact of changes in Brazilian economic growth, inflation, Brazilian federal government policies and other factors. As of December 2014, 2015, 2016, 2017 and 2018, the CDI rate was 11.57%, 14.14%, 13.63%, 6.89%, and 6.40%, respectively. The Brazilian Central Bank also periodically establishes the System for Settlement and Custody (*Sistema Especial de Liquidação e Custódia*), or the SELIC rate, which is the base interest rate for the Brazilian banking system and an important policy instrument for the achievement of Brazilian inflation targets. In recent years, the SELIC rate has fluctuated, and the Brazilian Central Bank has frequently adjusted the SELIC rate in response to economic uncertainties. As of December 31, 2014, 2015, 2016, 2017, and 2018, the SELIC rate was 11.75%, 14.25%, 13.75%, 7.00% and 6.50%, respectively. Any reductions in the SELIC rate could adversely affect us by decreasing the income we earn on our interest-earning assets and could materially adversely impact our business, financial position and results of operations.

We engage in hedging activity which may not be successful and may result in losses to us.

We may use foreign exchange and metal commodity non-deliverable forwards to reduce the risk associated with currency and metal price volatility. However, our hedging activities could cause us to lose the benefit of an increase in the prices of the metals we produce if they increase over the price level of hedge positions, or the benefit of an increase in the currency price. The cash flows and the mark-to-market values of our production hedges can be affected by factors such as the volatility of currency and the market price of metals, which are not under our control.

Our hedging agreements contain events of default and termination events that could lead to early close-outs of our hedges such as failure to pay, breach of the agreement, misrepresentation, default under our loans or other hedging agreements and bankruptcy. In the event of an early termination of our hedging agreements, the relevant hedge positions would be required to be settled at that time. In that event, there could be a lump sum payment to be made either to or by us. The magnitude and direction of such a payment would depend upon, among other things, the characteristics of the particular hedge instruments that were terminated and the relevant market prices at the time of termination. Any of the factors described above could have a material adverse effect on our financial position, results of operations or cash flows. See "Operating and financial review and prospects—Risk management—Metal price sensitivity."

Our business requires substantial capital expenditures and is subject to financing risks.

Our business is capital intensive. Exploration for and exploitation of mineral deposits, maintenance of machinery and equipment and compliance with applicable laws and regulations require substantial capital expenditures. We must continue to invest capital to maintain or to increase the amount of our metal reserves and our production. In 2018, we invested US\$299.7 million in capital expenditures. We depend partially on our cash flows for maintenance of capital expenditures. See "Information on the Company—Capital expenditures."

No assurance can be given that we will be able to maintain our production levels or generate sufficient cash flow, capitalize on a sufficient amount of our net income or have access to sufficient investments, loans or other financing alternatives to finance our capital expenditure program at a level necessary to continue our exploration and exploitation activities at the levels we feel appropriate. Any equity or debt financing, if available, may not be on terms that are favorable to us. If our access to external financing is limited, we may not be able to execute our strategy, which could adversely affect our business, financial position and results of operations.

We are exposed to credit risk in relation to our contractual and trading counterparties as well as to hedging and derivative counterparty risk.

We are subject to the risk that the counterparties with whom we conduct our business (in particular our customers) and who are required to make payments to us are unable to make such payment in a timely manner or at all. Credit risk is present in our hedging operations, customer operations and cash management operations. If amounts that are due to us are not paid or not paid in a timely manner, this may impact not only our current trading and cash-flow position but also our financial and business position. In addition, our derivatives, metals hedging, and foreign currency and energy risk management activities expose us to the risk of default by the counterparties to such arrangements. Any such default could have a material adverse effect on our business, financial position and results of operations.

Any acquisitions we make may not be successful or achieve the expected benefits.

We regularly consider and evaluate opportunities to acquire assets, companies and operations. There can be no assurance that we will be able to successfully integrate any acquired assets, companies or operations. In addition, any additional debt we incur to finance an acquisition may materially adversely affect our financial position and results of operations. If future acquisitions are significant, they could change the scale of our business and expose us to new geographic, political, operating and financial risks.

We may experience goodwill impairment.

Goodwill is initially recorded at fair value and is not amortized but is reviewed at least annually or more frequently if events or changes in circumstances indicate evidence of impairment. If our estimates of the recoverable amount change, we may determine that impairment charges are necessary. Estimates of the recoverable amount are determined based on a pre-tax discounted cash flow model. If our estimates of future cash flows are inaccurate, the recoverable amount determined could be inaccurate and impairment may not be recognized in a timely manner. If the recoverable amount declines, we may need to recognize goodwill impairment in the future, which could have a material adverse effect on our results of operations.

In the past, we have identified material weaknesses in our internal control over financial reporting. Although our management has concluded that our internal control over financial reporting was effective as of December 31, 2018, if we fail to establish and maintain effective internal control over financial reporting in the future, the accuracy and timeliness of our financial reporting may be adversely affected, which could cause investors to lose confidence in our reported financial information and may lead to a decline in the trading price of our common shares.

We identified material weaknesses in our internal control over financial reporting in prior years. These material weaknesses resulted in restatements of our consolidated financial statements as of and for the years ended December 31, 2017 and December 31, 2016. We have since developed and implemented procedures to address and remedy these material weaknesses, and our management has concluded that our internal control over financial reporting was effective as of December 31, 2018. For more information, see “Additional information—Internal control over financial reporting—Changes in internal control over financial reporting.”

We cannot be certain that additional material weaknesses will not develop or be discovered in the future. If other material weaknesses exist, we may be unable to report our financial results accurately on a timely basis, which could cause our reported financial results to be materially misstated. This could result in a loss of investor confidence and cause the market price of our common shares to decline.

Risks related to our mineral reserves***Our estimates of mineral reserves may be materially different from mineral quantities we actually recover, and market price fluctuations and changes in operating and capital costs may render certain mineral reserves uneconomical to mine.***

There is a degree of uncertainty attributable to the estimation of mineral reserves. Until reserves are actually mined and processed, the quantity and grades must be considered as estimates only. The mineral reserves

described in this report are estimated tonnages and grades that we have determined can be economically mined and processed under present and assumed future conditions. We may be required in the future to revise our mineral reserves estimates based on actual production experience, projects, updated exploration drilling data and other factors, and we cannot assure shareholders that the indicated amount and grade of mined and processed material will be recovered or that it will be recovered at the rates we anticipate. Market prices of our metals, increased production costs, reduced recovery rates, short-term operating factors, royalties, taxes, fees and other factors may render some or all proven and probable mineral reserves uneconomic to exploit and may ultimately result in a reduction of mineral reserves. Our Atacocha and Morro Agudo mines, as well as our greenfield projects, do not have estimated mineral reserves under Industry Guide 7.

We depend on our ability to replenish our mineral reserves for our long-term viability.

Mineral reserves data are only indicative of future results of operations at the time the estimates are prepared and are depleted as we mine. We use several strategies to replenish and increase our mineral reserves, including exploration activities and the acquisition of mining concessions. We cannot assure shareholders that we will be able to continue with our strategy to replenish mineral reserves indefinitely. If we are unable to replenish our mineral reserves, our business, results of operations and prospects would be materially adversely affected.

Our mineral exploration efforts are highly speculative in nature and may be unsuccessful.

Mineral exploration is highly speculative in nature, involves many uncertainties and risks and is frequently unsuccessful. It is performed to demonstrate the dimensions, position and mineral characteristics of mineral deposits, estimate mineral reserves, assess amenability of the deposit to mining and processing scenarios and estimate potential deposit value. Substantial expenditures are required to establish proven and probable mineral reserves to determine processes to extract the metals and, if required, to construct mining and processing facilities and obtain the rights on the land and resources required to develop the mining activities. Therefore, once mineralization is discovered, it may take several years from the initial exploration phases before production is possible, during which time the potential feasibility of the project may change adversely.

Health, safety and environmental risks

Health, safety, and environmental laws and regulations, including regulations pertaining to climate change, may increase our costs of doing business, restrict our operations or result in the imposition of fines or revocation of permits.

Our mining activities are subject to Brazilian and Peruvian laws and regulations, including health and safety and environmental matters. Additional matters subject to legislation include, but are not limited to, transportation, mineral storage, water use and discharge, use of explosives, hazardous and other non-hazardous waste, and reclamation and remediation measures. Our operations are subject to periodic inspections and special inspections in certain circumstances by governmental authorities and consultation with local communities. Compliance with these laws and regulations and new or existing regulations that may be applicable to us in the future could increase our operating costs and adversely affect our financial results of operations and cash flows.

Regulatory and industry response to climate change or other controls on greenhouse gas emissions, including limits on emissions from the combustion of carbon-based fuels, controls on effluents and restrictions on the use of certain materials, could significantly increase our operating costs and affect our customers. Ongoing international efforts to address greenhouse gas emissions consist of controlling activities that may increase the atmospheric concentration of greenhouse gases. International agreements, like the Paris Agreement and Kyoto Protocol, are in different stages of negotiation and implementation. The measures included in such agreements may result in an increase of costs related to the installation of new controls aimed at reducing greenhouse gas emissions, the purchase of credits or licenses for atmospheric emissions and the monitoring and registration of greenhouse gas emissions generated by our operations. These measures could adversely affect our business, financial position and results of operations. The potential impact of climate change on our operations is highly uncertain and would be particular to the geographic circumstances of our facilities and operations. It may include changes in rainfall patterns, water shortages, rising sea levels, changing storm patterns and intensities and changing temperatures. These effects may materially adversely impact the cost, production and financial performance of our operations.

Pursuant to applicable environmental regulations and laws, we could be found liable for all or substantially all the damages caused by mining activities at our current or former facilities or those of our predecessors at disposal sites. We could also be found liable for all incidental damages due to the exposure of individuals to hazardous substances or other environmental damage. We cannot assure shareholders that our costs of complying with current and future environmental and health and safety laws and regulations, including decommissioning and remediation requirements, and any liabilities arising from past or future releases of, or exposure to, hazardous substances will not materially adversely affect our business, financial position and results of operations.

Natural disasters, such as floods, mudslides and earthquakes, and the impact of climate change could damage our facilities.

Natural disasters could significantly damage our mining and production facilities and infrastructure and may cause a contraction in sales to countries adversely affected due to, among other factors, power outages and the destruction of industrial facilities and infrastructure. In particular, the Central Andean region, where two of our mines are located, is prone to mudslides and earthquakes of varying magnitudes. Due to the El Niño weather phenomenon, Peru recently experienced extreme weather conditions that led to flooding and mudslides and which adversely affected our operations. From March 17 to March 24, 2017, extreme flooding and mudslides in Peru interrupted the supply of metal concentrates from our El Porvenir and Atacocha mines to our customers as well as the supply of zinc products to our Cajamarquilla smelter due to the shutdown of the main roads and railways used to transport our products and raw materials, including the Peruvian central railway. The physical impact of climate change on our business remains uncertain, but we are likely to experience changes in rainfall patterns, increased temperatures, water shortages, rising sea levels, lower water levels in rivers due to natural or operational conditions, increased storm frequency and intensity as a result of climate change, which may adversely affect our operations. Although we have insurance covering damages caused by natural disasters, extensive damage to our facilities and staff casualties due to natural disasters could materially adversely affect our ability to conduct our operations and, as a result, reduce our future operating results.

Political, economic, social and regulatory risks

Recent and potential changes in commercial and mining laws may significantly impact our mining operations.

On July 26, 2017, the Brazilian federal government enacted measures that provided for significant changes to the regulatory framework of the Brazilian mining industry. The measures modified relevant aspects of the regulatory framework, including the terms of certain mining royalties, and created a new mining agency, the ANM (*Agência Nacional de Mineração*). The Brazilian congress approved the provisional measures. These and other changes to the Brazilian regulatory framework that could be enacted in the future may result in an increase in our expenses, particularly mining royalties. In addition, any changes in the interpretation of any Brazilian mining laws and regulations, including changes to our concession agreement and changes in commercial rules and protections, may increase our compliance, operational or other costs. For additional information, see “Information on the Company—Regulatory matters—Brazilian regulatory framework—Mining rights and regulation of mining activities.”

Our mineral rights may be terminated or not renewed by governmental authorities.

Our business is subject to extensive regulation in Brazil and Peru, including with respect to acquiring and renewing the required authorizations, permits, concessions and/or licenses from the relevant governmental regulatory bodies. We have obtained, or are in the process of obtaining, all material authorizations, permits, concessions and licenses required to conduct our mining and mining-related operations. However, we may need to renew exploration authorizations related to our Brazilian mining operations 60 days prior to their expiration date if we determine that we continue to have an economic or business interest in the area. With respect to mining concessions, there is no renewal requirement once we have obtained such concession. These authorizations, permits, concessions and environmental licenses are subject to our compliance with conditions imposed and regulations promulgated by the relevant governmental authorities. While we anticipate that all required authorizations, permits, concessions and environmental licenses or their renewals will be granted as and when sought, there is no assurance that these items will be granted as a matter of course, and there is no assurance that new conditions will not be imposed in connection with such renewals.

We must continue to assess the mineral potential of each mining concession to determine if the costs of maintaining the related exploration authorizations and mining concessions are justified by the results of operations to date. If such costs are not justified and we abandon the mine or suspend the mining activities without the formal consent of the regulatory authority for a period more than six months, we may lose the respective mining concessions. Alternatively, we may elect to withdraw or assign some of our exploration authorizations or mining concessions. In Brazil, if we fail to demonstrate the existence of technical and economically viable mineral deposits in an area covered by an exploration authorization, we may be required to return it to the federal government. The federal government may then grant exploration authorizations to other parties that may conduct other mineral prospecting activities at said area. Mining concessions in Peru may be terminated if the concessionaire does not comply with its obligations.

If we were to violate any of the foregoing laws and regulations or the conditions of our concessions, authorizations and environmental licenses, we may be subjected to substantial fines or criminal sanctions, revocations of operating permits or licenses and possible closings of certain of our facilities.

Our operations depend on our relations and agreements with local communities, and new projects require carrying out a prior consultation procedure.

There are several local communities that surround our operations in Brazil and Peru, most of which we have entered into agreements with that provide for the use of their land for our operations. We also interact with regional and local governments and depend on our close relations with local communities and such governments to carry out our operations. If our relations with the local communities and such governments were to deteriorate in the future, or the local communities do not comply with the existing agreements or renew them upon expiration, it could have a material adverse effect on our business, properties, operating results, financial position or prospects. In addition, a disruption in the relations between the local communities, governments and other parties may affect us indirectly.

Furthermore, to develop new projects in the countries in which we operate on land owned by, or in the possession of, third parties, we need to reach an agreement with such third parties to use that land. See “Regulatory matters—Brazilian regulatory framework.” For example, Brazilian law requires us to obtain social and environmental licenses for projects in areas with indigenous populations. Any delay or failure to reach such agreements or obtain governmental approvals for our new projects could result in a material adverse effect on our business, properties, operating results, financial position or prospects.

Changes in tax laws may increase our tax burden and, as a result, could adversely affect our business, financial position and results of operations.

The Brazilian, Peruvian and Luxembourg governments from time to time implement changes to tax laws and regulations. Any such changes, as well as changes in the interpretation of such laws and regulations, may result in increases to our overall tax burden, which would negatively affect our profitability. For example, in December 2016, the corporate tax rate in Peru for 2017 increased from 27.0% to 29.5% for Peruvian companies. Moreover, some tax laws may be subject to controversial interpretation by tax authorities, including, but not limited to, the regulation applicable to corporate restructurings. In the event an interpretation different than the one on which we based our transactions prevails, we may be adversely affected. We cannot assure shareholders that the Peruvian, Brazilian or Luxembourg governments will not implement additional changes to tax regulations in the future, which could adversely affect our business, financial position and results of operations.

We are subject to anti-corruption, anti-bribery and anti-money laundering laws and regulations in various jurisdictions. Any violations of any such laws or regulations could have a material adverse impact on our reputation and results of operations and financial position.

We are subject to anti-corruption, anti-bribery, anti-money laundering and other international laws and regulations and are required to comply with the applicable laws and regulations of Brazil, Peru, Luxembourg, Canada and the United States, among others. In addition, we are subject to economic sanctions regulations that restrict our dealings with certain sanctioned countries, individuals and entities. Our governance and compliance processes may not timely identify or prevent future breaches of legal, accounting or governance standards. We may be subject to instances of fraudulent behavior, corrupt practices and dishonesty by our affiliates, employees,

directors, officers, partners, agents and service providers. Any violations by us of anti-bribery and anti-corruption laws, sanctions regulations or other standards could have a material adverse effect on our business, reputation, results of operations and financial position.

Corruption investigations and media reports of alleged corruption in Brazil and Peru could materially adversely affect Brazilian and Peruvian markets, us, our industry and the trading price of our securities.

Brazilian markets have experienced heightened volatility due to the uncertainty in the local economy and political environment because of the ongoing corruption and bribery investigations by federal Brazilian prosecutors. The matters that have, and may continue to, come to light because of or in connection with the investigations have adversely affected, and are expected to continue to adversely affect, the Brazilian markets and trading prices of securities issued by certain Brazilian companies. Print, online and social media posts and reports have made allegations that certain Brazilian industries and conglomerates have been involved in conduct targeted by some of these investigations. Peruvian authorities are investigating corruption associated with past actions involving certain Brazilian construction companies with operations in Peru. Consequently, Peruvian lawmakers passed legislation that restricts payments made by, or to be made to, such Brazilian construction conglomerates. To the extent that any such reports, or further developments or allegations related to them or the above investigations, relate to us or to any of our affiliates, executives or directors, our public perception, reputation and the trading price of our common shares may be materially adversely affected.

Peru may experience political or economic problems that could affect our business, financial position and results of operations.

The operations of Nexa CJM and Nexa Peru are conducted in Peru and are dependent upon the performance of the Peruvian economy. As a result, our business, financial position and results of operations may be affected by the general conditions of the Peruvian economy, price instability, inflation, interest rates, regulation, taxation, social instability, political unrest and other developments in or affecting Peru over which we have no control. In 2018, our sales in Peru represented 27.0% of our consolidated net revenues. Our results of operations and general financial position depend in part on Peruvian markets for labor and certain services, materials, supplies, machinery and equipment, and on factors relating to Peruvian economic, social and political stability generally, and may be materially adversely affected by economic downturns, currency depreciation, inflation, interest rate fluctuation, government policies, regulation, taxation, social instability, political unrest, terrorism and other developments in or affecting the country.

Our financial position and results of operations may also be adversely affected by changes in Peru's political climate to the extent that such changes affect the nation's economic policies, growth, stability, outlook or regulatory environment. Beginning in December 2017, then-President Pedro Pablo Kuczynski faced accusations of lying about receiving bribes and ultimately admitted to receiving such payments. In March 2018, President Kuczynski submitted his resignation as president of Peru and was succeeded by Martín Vizcarra.

The uncertainty of the political climate in Peru could lead to changes in the Peruvian economy or economic policies, which may have a negative effect on our business, financial position and results of operations. Therefore, the risk of political and economic change should be carefully considered. There can be no assurance that Peru will not face political, economic or social problems in the future or that these problems will not interfere with our ability to service our indebtedness.

General economic and political conditions in Brazil may materially adversely affect our business, financial position and results of operations.

The operations of Nexa Brazil are conducted in Brazil and are dependent upon the performance of the Brazilian economy. As a result, general economic conditions in Brazil may have a material adverse impact on our business, financial position and results of operations. In 2018, our sales in Brazil represented 27.8% of our consolidated net revenues.

In the last years, Brazil faced an economic recession, adverse fiscal developments and political instability, which may continue. An economic slowdown in Brazil, coupled with the ongoing effects of the global economic crisis, may result in greater economic and financial volatility and continued stagnation in terms of GDP growth, all

of which could negatively affect the demand for and pricing of our products and, consequently, our business and results of operations.

In addition, Brazil recently lost its investment grade rating for long-term debt and received an additional downgrade from Standard & Poor's in January 2018. Due to our dependence on revenues from our Brazilian operations, we can be downgraded, which could limit our ability to obtain financing and increase our borrowing costs, and make it costlier to refinance maturing obligations, which would materially adversely impact our business and results of operations. Any further downgrade of Brazil's credit rating could also heighten investors' perception of risk and, as a result, adversely affect the price of our common shares.

Actions taken by the Brazilian federal government and the Brazilian Central Bank may not promote the expected recovery of the Brazilian economy. The Brazilian government's actions in response to exchange rate movement, monetary policies, inflation control, energy shortages and economic instability, among other matters, may have important effects on Brazilian companies, including us, and on market conditions and the competitiveness of Brazilian products abroad. Prior actions taken by the Brazilian federal government have involved wage and price controls, the implementation of new taxes and fluctuations of base interest rates. In addition, actions taken by Brazilian state and local governments with respect to labor and other laws affecting our operations may have an effect on us. Uncertainty over whether the Brazilian federal government will implement changes in policy or regulation affecting these or other factors in the future may contribute to economic uncertainty in Brazil and to heightened volatility in the market value of securities issued by Brazilian companies.

Currently, the Brazilian foreign exchange system allows the purchase and sale of foreign currency and the international transfer of *reais* by any person or legal entity, regardless of the amount, subject to certain regulatory procedures. We cannot predict whether the Brazilian Central Bank or the Brazilian government will continue to permit the *real* to float freely or will intervene in the exchange rate market through the return of a currency band system or otherwise. Furthermore, Brazilian law provides that, whenever there is a serious imbalance in Brazil's balance of payments or there are serious reasons to foresee a serious imbalance, temporary restrictions may be imposed on remittances of foreign capital abroad.

The political situation in Brazil has influenced the performance of the Brazilian economy; in particular, political crises have adversely affected investors' confidence and public sentiment, which has adversely affected economic development in Brazil, the credit rating of the Brazilian government and the operations and financial performance of Brazilian businesses. In August 2016, the Brazilian Congress approved the impeachment of the Brazilian president. Also, ongoing corruption investigations have led to charges against public officials, members of several political parties and directors and officers of many Brazilian companies. In October 2018, Brazil elected a new president, Jair Bolsonaro, who assumed office on January 1, 2019. The resolution of the political and economic crisis in Brazil still depends on the approval of reforms that are expected to be promoted by President Bolsonaro's administration. We cannot predict which policies the Brazilian government may adopt or change or the effect that any such policies might have on our business and on the Brazilian economy. Political instability may aggravate economic uncertainties in Brazil and increase volatility of securities of issuers with significant Brazilian operations like us.

Peru has a history of domestic terrorism that could affect our business, financial position and results of operations.

Peru was subject to a series of domestic terrorist attacks from groups like the Shining Path between the late 1970s and 1990s that caused thousands of casualties and affected normal political, economic and social activities in many parts of the country, including Lima, the capital. Since then, terrorist activity in Peru is mostly confined to small-scale operations in the Huallaga Valley and the Valleys of the Rivers Apurimac, Ene and Mantaro, or VRAEM, areas, both in the eastern part of the country. In 2012, the Peruvian government captured Florindo Flores, one of the last remaining leaders of Shining Path, and thus gravely weakened the organization's activities in the Huallaga Valley. Despite these efforts, terrorist activity and the illegal drug trade continue to be key challenges for Peruvian authorities. The Huallaga Valley and VRAEM constitute the largest areas of coca cultivation in the country and thus serve as a hub for the illegal drug trade. Any violence derived from the drug trade or a resumption of large-scale terrorist activities could hurt our operations.

Political and social opposition to mining activities generally in the regions where we operate could adversely impact our business and reputation.

Disputes with communities where we operate in Brazil and Peru may arise from time to time. In some instances, our operations and mineral reserves are located on or near lands owned or used by indigenous people or other groups of stakeholders. Some of our mining and other operations are in territories where title may be subject to disputes or uncertainties, or in areas claimed for agriculture or land reform purposes, which may lead to disagreements with organized social movements, local communities and the government. We may be required to consult and negotiate with these groups as part of the process to obtain licenses required to operate, to mitigate impact on our operations or to obtain access to their lands. Disagreements or disputes with local groups, including indigenous groups, organized social movements and local communities, could cause delays or interruptions to our operations, adversely affect our reputation or otherwise hamper our ability to develop our reserves and conduct our operations. Protesters have taken actions to disrupt our operations and projects, and they may continue to do so in the future, which may harm our operations and could adversely affect our business. In recent years, Peru has experienced protests against mining projects in several regions. On several occasions, local communities have opposed these operations and accused them of polluting the environment and hurting agricultural and other traditional economic activities. Social demands and conflicts could have a material adverse effect on our business and results of operations and the Peruvian or Brazilian economy in general.

Uncertainty in governmental agency interpretation or court interpretation and the application of such laws and regulations could result in unintended non-compliance.

The courts in some of the jurisdictions in which we operate may offer less certainty as to the judicial outcome of legal proceedings or a more protracted judicial process than is the case in more established economies. Businesses can become involved in lengthy court cases over simple issues when rulings are not clearly defined, and the poor drafting of laws and excessive delays in the legal process for resolving issues or disputes compound such problems. In addition, there may be limited or no relevant case law providing guidance on how courts would interpret such laws and the application of such laws to our contracts, joint ventures, licenses, license applications or other legal arrangements. Accordingly, there can be no assurance that contracts, joint ventures, licenses, license applications or other legal arrangements will not be adversely affected by the actions of government authorities and the effectiveness of and enforcement of such arrangements in these jurisdictions. Moreover, the commitment of local businesses, government officials and agencies and the judicial system in these jurisdictions to abide by legal requirements and negotiated agreements may be more uncertain and may be susceptible to revision or cancellation, and legal redress may be uncertain or delayed. These uncertainties and delays could have a material adverse effect on our business and results of operations.

Risks relating to our corporate structure***VSA has substantial control over us, which could limit our shareholders' ability to influence the outcome of important corporate decisions.***

As of March 25, 2019, VSA owns 64.25% of our issued common shares. As a result, VSA can influence or control matters requiring approval by our shareholders, including the election of directors and the approval of mergers, acquisitions or other extraordinary transactions. VSA may also have interests that differ from our other investors and may vote in a way with which our other shareholders disagree, and which may be adverse to the interests of our other investors.

Dividends or other distributions paid by us on our common shares will generally be subject to Luxembourg withholding tax.

Any dividends or other distributions paid by us on our common shares will be subject to a Luxembourg withholding tax at a rate of 15.0% unless an exemption or reduction in rate applies. The withholding tax must be withheld from the gross distribution and paid to the Luxembourg tax authorities. Under certain circumstances, distributions as share capital reductions or share premium reimbursements may not be subject to withholding tax, but there are no assurances that we will be able to make such distributions in the future. See "Taxation—Luxembourg Tax Considerations—Shareholders."

The rights of our shareholders, and the responsibilities of VSA as our controlling shareholder, are governed by Luxembourg law and differ in some respects from the rights and responsibilities of shareholders under the laws of other jurisdictions, including the United States and Canada, and shareholders may have more difficulty protecting their interests than they would as shareholders of a U.S. or Canadian corporation.

Our corporate affairs are governed by our articles of association and by the laws governing limited liability companies organized under the laws of Luxembourg, as well as such other applicable local law, rules and regulations. The rights of our shareholders and the responsibilities of VSA as our controlling shareholder and of our directors and officers under Luxembourg law are different from those applicable to a corporation incorporated in the United States. There may be less publicly available information about us than is regularly published by or about U.S. or Canadian issuers. Also, Luxembourg regulations governing the securities of Luxembourg companies may not be as extensive as those in effect in the United States or Canada, and Luxembourg law and regulations in respect of corporate governance matters may not be as protective of non-controlling shareholders as corporation laws in the United States or Canada. Therefore, shareholders may have more difficulty protecting their interests in connection with actions taken by us, our directors and officers or our principal shareholders than they would as shareholders of a corporation incorporated in the United States or Canada.

While we currently intend to make distributions on our common shares annually, our ability to do so may be constrained by regulatory constraints and our holding company structure.

We intend to pay dividends or other distributions on our common shares in accordance with our dividend policy. See “Share ownership and trading—Distributions.” However, any determination to pay dividends or other distributions (including reimbursements of share premium) will be subject to the approval of our board of directors or our shareholders, as applicable, and will depend on a number of factors, including, but not limited to, our cash balance, cash flow, earnings, capital investment plans, expected future cash flows from operations, our strategic plans and cash dividend distributions from our subsidiaries, as well as restrictions imposed by applicable law and contractual restrictions (although as of the date of this report there are no contractual restrictions on our ability to pay dividends or other distributions to our shareholders). Luxembourg law also imposes certain requirements regarding distributions. For additional information, see “Share ownership and trading—Distributions.”

We are a holding company and have no material assets other than our ownership of shares in our subsidiaries. When we pay a dividend or other distribution on our common shares in the future, we generally cause our operating subsidiaries to make distributions to us in an amount sufficient to fund any such dividends or distributions. Although as of December 31, 2018, there are no material contractual restrictions on our subsidiaries’ ability to make distributions to us, their ability to do so is subject to their capacity to generate sufficient earnings and cash flow and may also be affected by statutory accounting and tax rules in Brazil and Peru.

It could be difficult for investors to enforce any judgment obtained outside Luxembourg against us or any of our associates.

We are organized under the laws of Luxembourg. Furthermore, certain of our directors and officers reside outside the United States and Canada and most of their assets are located outside the United States and Canada. Most of our assets are located outside the United States. As a result, it may not be possible for investors to effect service of process upon us or our directors and officers within the United States, Canada or other jurisdictions outside Luxembourg or to enforce against us or our directors and officers judgments obtained in the United States, Canada or other jurisdictions outside Luxembourg. Because judgments of U.S. or Canadian courts for civil liabilities based upon the U.S. federal securities laws or Canadian securities laws may only be enforced in Luxembourg if certain requirements are met, investors may face greater difficulties in protecting their interest in actions against us or our directors and officers than would investors in a corporation incorporated in a state or other jurisdiction of the United States or Canada.

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Selected Financial Data

SELECTED FINANCIAL DATA

The following tables present our selected consolidated financial data for each of the periods and the dates indicated below.

The selected consolidated financial data should be read in conjunction with the consolidated financial statements included elsewhere in this report. Our consolidated financial statements have been prepared in accordance with IFRS.

	For the Year Ended December 31,				
	2018	2017	2016	2015	2014
Consolidated income statement information:					
Continuing operations					
Net revenues	2,491.2	2,449.5	1,964.8	1,865.2	2,118.3
Cost of sales	(1,888.9)	(1,752.8)	(1,504.2)	(1,533.3)	(1,673.2)
Gross profit	602.3	696.7	460.6	331.9	445.1
Operating expenses:					
Selling	(18.7)	(17.6)	(25.5)	(14.6)	(14.8)
General and administrative	(140.9)	(136.9)	(118.7)	(74.9)	(99.0)
Mineral exploration and project development	(126.3)	(92.7)	(46.7)	(34.6)	(58.8)
Other income and expenses, net	18.2	(47.9)	(139.7)	(43.9)	(100.3)
Total operating expenses	(267.7)	(295.1)	(330.6)	(168.0)	(272.9)
Operating income	334.6	401.6	130.0	163.9	172.2
Financial income	67.5	29.9	25.0	19.3	13.7
Financial expenses	(121.7)	(106.2)	(70.4)	(61.6)	(73.5)
Foreign exchange (loss) gain, net	(148.5)	(53.9)	124.5	(299.6)	(107.3)
Net financial results	(202.7)	(130.2)	79.1	(341.9)	(167.1)
Share in the results of associates	—	0.1	(0.2)	(0.3)	—
Income before income tax	131.9	271.5	208.9	(178.3)	5.1
Current income tax	(71.8)	(125.7)	(75.3)	(62.8)	(81.3)
Deferred income tax	30.9	19.5	(23.1)	101.5	53.9
Net income for the year from continuing operations	91.0	165.3	110.5	(139.6)	(22.3)
Discontinued operations	—	—	—	(0.3)	(4.8)
Net income for the year	91.0	165.3	110.5	(139.9)	(27.1)
Net income attributable to:					
Nexa Resources' shareholders	74.9	126.9	93.2	(129.5)	(33.8)
Non-controlling interests	16.1	38.4	17.3	(10.3)	6.7
Weighted average number of shares outstanding (in millions)	133.3	116.5	80.7	1.9	1.8
Basic and diluted earnings (loss) per share (in US\$)	0.6	1.1	1.2	(69.1)	(18.6)

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Selected Financial Data

	As of December 31,				
	2018	2017	2016 (in millions of US\$)	2015	2014
Consolidated balance sheet information:					
Assets					
Cash and cash equivalents	1,032.9	1,019.0	915.6	621.4	750.7
Financial investments	91.9	206.2	117.0	57.9	22.6
Inventory	269.7	324.9	291.8	230.6	285.9
Total current assets⁽¹⁾	1,698.0	1,838.9	1,591.8	1,143.8	1,344.6
Intangible assets	1,742.5	1,822.7	1,903.1	1,969.0	2,062.2
Property, plant and equipment	1,968.5	1,996.5	1,978.5	1,883.4	2,227.0
Total non-current assets	4,037.4	4,122.6	4,568.5	4,488.0	4,987.1
Total assets	5,735.4	5,961.5	6,160.6	5,657.2	6,331.7
Liabilities					
Loans and financing (current)	32.5	40.8	62.6	41.4	102.6
Trade payables	387.2	329.8	282.2	259.7	243.8
Total current liabilities	651.8	768.2	875.9	532.0	585.5
Loans and financing (non-current)	1,392.4	1,406.5	1,081.8	1,014.8	1,252.2
Total non-current liabilities	2,181.7	2,284.4	1,960.4	1,578.1	1,869.8
Total liabilities	2,833.6	3,052.6	2,836.2	2,128.7	2,455.3
Shareholders' equity					
Total equity attributable to owners of the parent	2,476.6	2,486.8	2,848.0	2,585.4	2,654.1
Non-controlling interests	425.2	422.1	476.3	943.1	1,222.3
Total shareholders' equity	2,901.9	2,908.9	3,324.3	3,528.5	3,876.4
Total liabilities and shareholders' equity	5,735.4	5,961.5	6,160.6	5,657.2	6,331.7

(1) Includes assets held for sale.

	For the Year Ended December 31,				
	2018	2017	2016 (in millions of US\$)	2015	2014
Consolidated Statement of Cash Flows Information:					
Net cash provided by (used in):					
Operating activities	347.6	378.9	585.1	414.6	392.3
Investing activities	(158.1)	(328.4)	(201.5)	(156.7)	(432.1)
Financing activities	(177.4)	52.9	(92.2)	(385.9)	200.3
Effects of exchange rates on cash and cash equivalents	1.8	0.1	2.8	(1.3)	—
Increase (decrease) in cash and cash equivalents	13.9	103.5	294.2	(129.3)	160.5
Cash and cash equivalents at the beginning of the year	1,019.0	915.6	621.4	750.7	590.2
Cash and cash equivalents at the end of the year	1,032.9	1,019.0	915.6	621.4	750.7

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Selected Financial Data

	As of and For the Year Ended December 31,		
	2018	2017	2016
	(in millions of US\$, except financial ratios)		
Other Financial Information			
Depreciation and amortization	267.2	270.5	275.0
Interest paid on loans and financing	(74.6)	(58.6)	(37.3)
Adjusted working capital ⁽¹⁾	109.0	85.3	74.0
Adjusted EBITDA⁽¹⁾	604.8	667.5	403.9
Adjusted EBITDA by segment ⁽¹⁾ :			
Mining	430.4	521.5	336.8
Smelting	174.8	152.7	70.5
Other ⁽²⁾	(0.4)	(6.8)	(3.4)
Total	604.8	667.5	403.9
Net debt (period end) ⁽¹⁾	302.8	225.1	126.1
Net debt to Adjusted EBITDA ratio ⁽¹⁾	0.50	0.34	0.31

(1) See discussion below.

(2) The line item “Other” represents the residual component of Adjusted EBITDA either not pertaining to the mining or smelting segments, or, represents items that, because of their nature, are not being allocated to a specific segment.

Non-IFRS measures and reconciliation

Our management uses non-IFRS measures such as Adjusted EBITDA, among other measures, for internal planning and performance measurement purposes. We believe these measures provide useful information about the financial performance of our operations that facilitates period-to-period comparisons on a consistent basis. Management uses Adjusted EBITDA internally to evaluate our underlying operating performance for the reporting periods presented and to assist with the planning and forecasting of future operating results. Management believes that Adjusted EBITDA is a useful measure of our performance because it reflects our cash generation potential from our operational activities excluding exceptional items of the period. These measures should not be considered individually or as a substitute for net income or operating income, as indicators of operating performance, or as alternatives to cash flow as measures of liquidity. Additionally, our calculation of Adjusted EBITDA and other non-IFRS measures may be different from the calculation used by other companies, including our competitors in the mining industry, so our measures may not be comparable to those of other companies.

In this report, we present Adjusted EBITDA, which we define as (i) net income for the year, *plus* (ii) share in the results of associates *plus* (iii) depreciation and amortization, *plus/less* (iv) net financial results, *plus/less* (v) income tax, *less* (vi) exceptional items, composed of impairment of property, plant and equipment and miscellaneous adjustments. In addition, management may exclude non-cash items considered exceptional from the measurement of Adjusted EBITDA.

A reconciliation of Adjusted EBITDA to our net income for the years indicated is presented below.

	For the Year Ended December 31,		
	2018	2017	2016
	(in millions of US\$)		
Reconciliation of Adjusted EBITDA:			
Net income for the year	91.0	165.3	110.5
(+) Share in the results of associates	0.0	(0.1)	0.2
(+) Depreciation and amortization	267.2	270.5	275.0
(-/-) Net financial results	202.7	130.2	(79.1)
(-/-) Income tax	40.9	106.2	98.4
(-/-) Exceptional items	3.0	(4.6)	(1.1)
Adjusted EBITDA	604.8	667.5	403.9

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Selected Financial Data

We define Adjusted EBITDA by segment as (i) net income for the year, *plus* (ii) share in the results of associates, *plus* (iii) depreciation and amortization, *plus/less* (iv) net financial results, *plus/less* (v) income tax, *plus/less* (vi) exceptional items, which are composed of impairment of property, plant and equipment and miscellaneous adjustments. See Note 5.2 to our consolidated financial statements.

A reconciliation of Adjusted EBITDA by segment indicated is presented below.

	For the Year Ended December 31,		
	2018	2017 (in millions of US\$)	2016
Reconciliation of Adjusted EBITDA by segment:			
Mining	430.4	521.5	336.8
Smelting	174.8	152.7	70.5
Other ⁽¹⁾	(0.4)	(6.8)	(3.4)
Adjusted EBITDA	604.8	667.5	403.9

- (1) Represents the residual component of Adjusted EBITDA either not pertaining to the mining or smelting segments, or, represents items that, because of their nature, are not being allocated to a specific segment.

We also present herein our net debt, which we define as (i) loans and financing *less* (ii) cash and cash equivalents, *less* (iii) financial investments, *plus/less* (iv) the fair value of derivative financial liabilities or assets, respectively. Our management believes that net debt is an important figure because it indicates our ability to repay outstanding debts that become due simultaneously using available cash and highly liquid assets.

A reconciliation of net debt to loans and financing as of December 31, 2018, 2017, and 2016 is presented below.

	As of December 31,		
	2018	2017 (in millions of US\$)	2016
Calculation of Net Debt:			
Loans and financing	1,424.9	1,447.3	1,144.4
Cash and cash equivalents	(1,032.9)	(1,019.0)	(915.6)
Derivative financial instruments	3.0	3.3	16.8
Financial investments	(92.2)	(206.5)	(119.5)
Net Debt	302.8	225.1	126.1

We define net debt to Adjusted EBITDA ratio as net debt divided by Adjusted EBITDA.

The calculation of our net debt to Adjusted EBITDA ratio for the periods indicated is presented below.

	As of and For the Year Ended December 31,		
	2018	2017 (in millions of US\$)	2016
Calculation of Net Debt to Adjusted EBITDA Ratio:			
Net debt (period end)	302.8	225.1	126.1
Adjusted EBITDA	604.8	667.5	403.9
Net Debt to Adjusted EBITDA Ratio	0.50	0.34	0.31

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Selected Financial Data

We define Adjusted EBITDA margin as Adjusted EBITDA divided by net revenues. The calculation of our Adjusted EBITDA margin for the periods indicated is presented below.

	For the Year Ended December 31,		
	2018	2017 (in millions of US\$)	2016
Calculation of Adjusted EBITDA Margin:			
Adjusted EBITDA	604.8	667.5	403.9
Net revenues	2,491.2	2,449.5	1,964.8
Adjusted EBITDA Margin	24%	27%	21%

We calculate adjusted working capital as (i) trade accounts receivable, *plus* (ii) inventory, *plus* (iii) other assets, *less* (iv) trade payables, *less* (v) confirming payable, *less* (vi) salaries and payroll charges, *less* (vii) other liabilities. Our management believes that adjusted working capital is an important figure because it provides a relevant metric for the efficiency and liquidity of our operating activities.

The calculation of our adjusted working capital derived from our consolidated financial statements as of December 31, 2018, 2017, and 2016 is presented below.

	As of December 31,		
	2018	2017 (in millions of US\$)	2016
Calculation of Adjusted Working Capital:			
Trade accounts receivable	173.2	182.7	120.1
Inventory	269.7	324.9	291.8
Other assets ⁽¹⁾	243.0	171.8	188.6
Trade payables	(387.2)	(329.8)	(282.2)
Confirming payable	(70.4)	(111.0)	(102.3)
Salaries and payroll charges	(58.1)	(79.8)	(70.0)
Other liabilities ⁽²⁾	(77.3)	(87.6)	(86.7)
Adjusted working capital	92.9	71.2	59.3

- (1) For the year ended December 31, 2016, this amount relates to Judicial deposits and Other assets as presented in our consolidated financial statements. For the years ended December 31, 2018 and 2017, this amount relates to Other assets as presented in our consolidated financial statements.
- (2) For the year ended December 31, 2016, this amount relates to Advance from customer, Use of public assets and Other liabilities as presented in our consolidated financial statements. For the years ended December 31, 2018 and 2017, this amount relates to the Other liabilities as presented in our consolidated financial statements.

Cash cost, after by-product credits and related measures

In this report, we also present measures of costs that are widely used by peer companies operating in the mining and smelting industries. These performance measures are not IFRS measures, and they do not have a standard meaning and therefore may not be comparable to similar data presented by other mining and smelting companies. They should not be considered as a substitute for costs of sales, costs of selling and administrative expenses, or as an indicator of costs. Similar measures are also calculated by Wood Mackenzie for many market participants, but Wood Mackenzie's methodology differs from the methodology we use below.

Our management uses cash cost, after by-product credits and related measures, among other measures, for internal planning and performance measurement purposes. We believe these measures provide useful information about the operational performance of our operations that facilitates period-to-period comparisons on a consistent basis.

In calculating cash cost, after by-product credits, we account for transactions between our mining operations and our smelting operations using the same methodology we use to evaluate the performance of our

mining and smelting segments. See Note 1 to our consolidated financial statements. We prepare an internal calculation based on transfer-pricing adjustments made on an arm's length principle basis. All information disclosed for cash cost, after by-product credits is consistent with this methodology.

Mining operations

Cash cost, after by-product credits: For our mining operations, cash cost, after by-product credits includes all direct cash cost, after by-product credits of mining, including costs associated with mining, concentrating, leaching, solvent extraction and electrowinning, on-site administration and general expenses, any off-site services essential to the operation, concentrate freight costs, marketing costs and property and severance taxes paid to state or federal agencies that are not profit-related. Treatment and refining charges on metal sales, which are typically recognized as a deduction component of sales revenues, are added to cash cost, after by-product credits. Cash cost is calculated on a zinc equivalent basis after the deduction of by-product credits attributable to mining operations, such as silver, gold, and lead, which are deducted from total cash cost.

Sustaining cash cost, after by-product credits: Sustaining cash cost, after by-product credits is defined as the cash cost, after by-product credits *plus* non-expansion capital expenditure, including sustaining health, safety and environment, modernization and other non-expansion-related capital expenditures.

All-in sustaining cost, after by-product credits: All-in sustaining cost (or AISC) is defined as sustaining cash cost, after by-product credits *plus* corporate general and administrative expenses, royalties and workers' participation.

Smelting operations

Cash cost, after by-product credits: For our smelting operations, cash cost, after by-product credits includes all the costs of smelting, such as costs associated with labor, net energy, maintenance materials, consumables and other on-site costs, as well as raw material costs. By-product sales are deducted from total cash cost, after by-product credits directly attributable to smelting operations.

Sustaining cash cost, after by-product credits: Sustaining cash cost, after by-product credits is defined as the cash cost, after by-product credits *plus* non-expansion capital expenditure, including sustaining health, safety and environment, modernization and other non-expansion-related capital expenditures.

All-in sustaining cost, after by-product credits: All-in sustaining cost is defined as sustaining cash cost, after by-product credits *plus* general and administrative expenses and workers' participation.

For mining operations, we present below cash cost, after by-product credits, sustaining cash cost, after by-product credits and all-in sustaining cost and a reconciliation to our consolidated financial statements.

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Selected Financial Data

For the year ended December 31, 2018

	Vazante	Morro Agudo	Cerro Lindo Operations	El Porvenir (in millions of US\$, unless otherwise indicated)	Atacocha	Consolidation of Operations	Corporate and Others ⁽¹⁾	Mining
Sales Volume (Zinc Contained in Concentrate)								
Tonnes	140,776	26,408	129,656	59,510	17,066	373,416	—	373,416
Cost of goods sold	76.5	44.5	328.5	154.9	93.0	697.4	(3.4)	694.0
On-site G&A	5.6	5.5	—	—	—	11.1	—	11.1
By-product credits	(7.4)	(17.7)	(290.0)	(73.3)	(57.2)	(445.7)	0.7	(444.9)
Treatment and refining charges	62.1	9.9	47.0	25.4	7.2	151.6	—	151.6
Selling expenses	—	0.9	0.8	0.9	0.3	3.0	—	3.0
Depreciation and amortization	(17.6)	(5.6)	(87.5)	(36.5)	(24.3)	(171.5)	(0.9)	(172.4)
Royalties	(1.7)	(1.5)	—	—	—	(3.2)	—	(3.2)
Others ⁽¹⁾	—	—	(5.4)	(0.3)	—	(5.7)	—	(5.7)
Cash cost, after by-product credits (sold)	117.5	36.0	(6.5)	71.0	19.0	237.0	(3.5)	233.5
Cash cost, after by-product credits (sold) (US\$/tonne)	834.5	1,363.8	(50.4)	1,192.9	1,115.5	634.7	—	625.3
Non-expansion capital expenditure	42.4	12.3	25.3	25.6	16.9	122.4	1.3	123.7
Sustaining cash cost, after by-product credits	159.8	48.3	18.7	96.6	35.9	359.4	(2.2)	357.2
Sustaining cash cost, after by-product credits (sold) (US\$/tonne)	1,135.5	1,829.5	144.3	1,623.2	2,105.5	962.5	—	956.7
Workers participation & bonus	1.2	0.7	8.6	4.0	0.0	14.6	—	14.6
Royalties	1.7	1.5	—	1.9	0.9	6.0	—	6.0
Corporate G&A	—	—	—	—	—	—	31.4	31.4
AISC (sold) ⁽²⁾ (US\$/tonne)	—	—	—	—	—	—	—	409.3
	—	—	—	—	—	—	—	1,096.0

(1) "Others" includes Enercan, inactive operations and non-operational provisions and reversals.

(2) Starting in 2018, certain expenses that were previously presented as General and administrative expenses and Other income and expenses, net in our income statement were reclassified as Mineral exploration and project development expenses. As a result of this change, we have adjusted our calculations of AISC.

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Selected Financial Data

For the year ended December 31, 2017

	Vazante	Morro Agudo	Cerro Lindo Operations	El Porvenir (in millions of US\$, unless otherwise indicated)	Atacocha	Consolidation of Operations	Corporate and Others ⁽¹⁾	Mining
Sales Volume (Zinc Contained in Concentrate)								
Tonnes	135,379	20,969	156,034	45,564	17,038	374,984	—	374,984
Cost of goods sold	70.8	46.8	322.8	133.0	94.2	667.6	13.3	680.8
On-site G&A	5.3	3.0	—	—	—	8.4	—	8.4
By-product credits	(7.2)	(18.6)	(320.4)	(70.6)	(77.4)	(494.2)	(5.6)	(499.8)
Treatment and refining charges	78.5	10.1	66.8	23.3	8.3	186.9	—	186.9
Selling expenses	—	0.9	(0.6)	1.4	(0.3)	1.5	—	1.5
Depreciation and amortization	(15.1)	(6.1)	(92.2)	(32.6)	(24.9)	(170.8)	(0.2)	(171.1)
Royalties	(1.7)	(1.6)	—	—	—	(3.3)	—	(3.3)
Others ⁽¹⁾	—	—	(5.8)	0.6	(3.2)	(8.3)	—	(8.3)
Cash cost, after by-product credits (sold)	130.7	34.5	(29.4)	55.1	(3.3)	187.6	7.4	195.0
Cash cost, after by-product credits (sold) (US\$/tonne)	965.3	1,644.3	(188.6)	1,210.2	(191.1)	500.3	—	520.1
Non-expansion capital expenditure	21.3	7.9	7.5	19.8	5.6	62.0	0.5	62.6
Sustaining cash cost, after by-product credits	152.0	42.3	(22.0)	74.9	2.4	249.6	8.0	257.6
Sustaining cash cost, after by-product credits (sold) (US\$/tonne)	1,122.5	2,019.0	(140.8)	1,644.6	139.5	665.7	—	686.9
Workers participation & bonus	1.8	0.8	25.3	3.4	1.1	32.4	—	32.4
Royalties	1.7	1.6	—	1.4	1.2	5.9	—	5.9
Corporate G&A	—	—	—	—	—	—	31.5	31.5
AISC (sold)⁽²⁾ (US\$/tonne)	—	—	—	—	—	—	0.0	327.3
								0.0
								872.7

(1) "Others" includes Enercan, inactive operations and non-operational provisions and reversals.

(2) Starting in 2018, certain expenses that were previously presented as General and administrative expenses and Other income and expenses, net in our income statement were reclassified as Mineral exploration and project development expenses. As a result of this change, we have adjusted our calculations of AISC.

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Selected Financial Data

For the year ended December 31, 2016

	Vazante	Morro Agudo	Cerro Lindo	El Porvenir	Atacocha	Consolidation of Operations	Corporate and Others ⁽¹⁾	Mining
Operations (in millions of US\$, unless otherwise indicated)								
Sales Volume (Zinc Contained in Concentrate)								
Tonnes	135,509	22,688	173,001	62,434	22,232	415,864	—	415,864
Cost of goods sold	66.2	35.9	313.4	117.5	95.1	628.1	(19.3)	608.8
On-site G&A	4.5	1.9	—	—	—	6.5	—	6.5
By-product credits	(4.2)	(16.0)	(252.1)	(72.7)	(68.2)	(413.3)	18.7	(394.6)
Treatment and refining charges	87.5	11.3	82.3	34.1	11.9	227.2	—	227.2
Selling expenses	0.7	3.3	—	2.0	0	6.1	—	6.1
Depreciation and amortization	(17.7)	(4.9)	(97.7)	(29.4)	(22.6)	(172.2)	(4.1)	(176.3)
Royalties	(1.8)	(1.4)	—	—	—	(3.3)	—	(3.3)
Others ⁽¹⁾	—	—	(1.2)	0.2	(1.0)	(2.0)	—	(2.0)
Cash cost, after by-product credits (sold)	135.2	30.3	44.8	51.7	15.2	277.3	(4.7)	272.5
Cash cost, after by-product credits (sold) (US\$/tonne)	997.7	1,336.2	259.1	828.4	684.9	666.8	—	655.3
Non-expansion capital expenditure	8.9	3.5	18.0	35.4	4.9	70.7	0.2	70.9
Sustaining cash cost, after by-product credits	144.1	33.8	62.9	87.1	20.2	348.0	(4.5)	343.5
Sustaining cash cost, after by-product credits (sold) (US\$/tonne)	1,063.1	1,489.9	363.4	1,395.0	906.8	836.8	—	825.9
Workers participation & bonus	0.8	0.8	17.3	5.8	1.2	26.0	—	26.0
Royalties	1.8	1.4	—	1.6	1.0	5.8	—	5.8
Corporate G&A	—	—	—	—	—	—	35.9	35.9
AISC (sold) ⁽²⁾ (US\$/tonne)	—	—	—	—	—	—	—	411.2
								988.7

(1) "Others" includes Enercan, inactive operations and non-operational provisions and reversals.

(2) Starting in 2018, certain expenses that were previously presented as General and administrative expenses and Other income and expenses, net in our income statement were reclassified as Mineral exploration and project development expenses. As a result of this change, we have adjusted our calculations of AISC.

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Selected Financial Data

For our smelting operations, we present below cash cost, after by-product credits, sustaining cash cost, after by-product credits and all-in sustaining cost and a reconciliation to our consolidated financial statements.

For the year ended December 31, 2018

	Três Marias	Juiz de Fora Operations	Cajamarquilla (in millions of US\$, unless otherwise indicated)	Consolidation of Operations	Corporate and Others ⁽¹⁾	Smelting
Sales Volume (Zinc Contained in Products)						
Tonnes	197,372	78,106	332,036	607,514	—	607,514
Cost of goods sold	586.9	239.7	1,066.3	1,892.9	(16.9)	1,876.0
Cost of services rendered	(11.5)	(3.5)	(35.9)	(50.8)	—	(50.8)
On-site G&A	4.2	6.4	15.0	25.6	2.1	27.8
Depreciation and amortization	(15.6)	(13.1)	(64.8)	(93.6)	(1.2)	(94.8)
By-product credits	(14.4)	(23.0)	(75.6)	(113.1)	3.8	(109.3)
Cash cost, after by-product credits (sold)	549.6	206.5	905.0	1,661.0	(12.1)	1,648.9
Cash cost, after by-product credits (sold) (per tonne)	2,784.6	2,643.4	2,725.5	2,734.1	—	2,714.2
Non-expansion capital expenditure	38.7	20.6	19.3	78.6	6.8	85.5
Sustaining cash cost, after by-product credits	588.3	227.1	924.3	1,739.7	(5.3)	1,734.4
Sustaining cash cost, after by-product credits (sold) (per tonne)	2,980.7	2,907.5	2,783.6	2,863.6	—	2,854.8
Workers' participation	0.9	1.1	1.6	3.6	—	3.6
Corporate G&A	—	—	—	—	52.8	52.8
AISC (sold) ⁽²⁾	—	—	—	—	—	1,790.7
AISC (sold) (per tonne)	—	—	—	—	—	2,947.6

(1) "Others" includes Enercan, inactive operations and non-operational provisions and reversals.

(2) Starting in 2018, certain expenses that were previously presented as General and administrative expenses and Other income and expenses, net in our income statement were reclassified as Mineral exploration and project development expenses. As a result of this change, we have adjusted our calculations of AISC.

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Selected Financial Data

For the year ended December 31, 2017

	Três Marias	Juiz de Fora Operations	Cajamarquilla Operations (in millions of US\$, unless otherwise indicated)	Consolidation of Operations	Corporate and Others ⁽¹⁾	Smelting
Sales Volume (Zinc Contained in Products)						
Tonnes	191,158	81,330	312,009	584,497	—	584,497
Cost of goods sold	527.4	235.5	959.8	1,722.6	24.1	1,746.8
Cost of services rendered	(9.3)	(4.0)	(37.3)	(50.6)	1.2	(49.4)
On-site G&A	3.8	2.8	15.5	22.2	2.0	24.2
Depreciation and amortization	(14.4)	(14.9)	(67.4)	(96.7)	(2.7)	(99.4)
By-product credits	(12.4)	(18.6)	(56.6)	(87.6)	(6.4)	(94.0)
Cash cost, after by-product credits (sold)	495.2	200.8	814.0	1,510.0	—	1,528.2
Cash cost, after by-product credits (sold) (per tonne)	2,590.5	2,468.4	2,608.9	2,583.4	—	2,614.6
Non-expansion capital expenditure	43.5	17.5	20.0	81.0	5.4	86.4
Sustaining cash cost, after by-product credits	538.7	218.2	834.0	1,591.0	—	1,614.6
Sustaining cash cost, after by-product credits (sold) (per tonne)	2,818.3	2,683.5	2,673.0	2,722.0	—	2,762.4
Workers' participation	2.0	1.6	1.7	5.2	—	5.2
Corporate G&A	—	—	—	—	63.3	63.3
AISC (sold) ⁽²⁾	—	—	—	—	—	1,683.1
AISC (sold) (per tonne)	—	—	—	—	—	2,879.6

(1) "Others" includes Enercan, inactive operations and non-operational provisions and reversals.

(2) Starting in 2018, certain expenses that were previously presented as General and administrative expenses and Other income and expenses, net in our income statement were reclassified as Mineral exploration and project development expenses. As a result of this change, we have adjusted our calculations of AISC.

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Selected Financial Data

For the year ended December 31, 2016

	Três Marias	Juiz de Fora Operations	Cajamarquilla Operations (in millions of US\$, unless otherwise indicated)	Consolidation of Operations	Corporate and Others ⁽¹⁾	Smelting
Sales Volume (Zinc Contained in Products)						
Tonnes	190,109	83,230	327,889	601,229	—	601,229
Cost of goods sold	363.9	176.9	741.2	1,282.0	25.5	1,307.4
Cost of services rendered	(7.5)	(3.1)	(35.8)	(46.4)	(0.4)	(46.8)
On-site G&A	2.6	3.1	12.4	18.1	1.8	19.9
Depreciation and amortization	(11.2)	(16.3)	(66.5)	(94.0)	(4.7)	(98.8)
By-product credits	(10.8)	(14.5)	(74.0)	(99.4)	(6.4)	(105.8)
Cash cost, after by-product credits (sold)	337.0	146.0	577.3	1,060.3	15.6	1,075.9
Cash cost, after by-product credits (sold) (per tonne)						
	1,772.6	1,754.6	1,760.5	1,763.5	—	1,789.5
Non-expansion capital expenditure	23.8	12.5	26.5	62.8	1.4	64.1
Sustaining cash cost, after by-product credits	360.8	158.5	603.8	1,123.0	17.0	1,140.0
Sustaining cash cost, after by-product credits (sold) (per tonne)						
	1,897.7	1,904.2	1,841.4	1,867.9	—	1,896.2
Workers' participation	1.7	1.3	1.6	4.6	—	4.6
Corporate G&A	—	—	—	—	48.1	48.1
AISC (sold) ⁽²⁾	—	—	—	—	—	1,192.7
AISC (sold) (per tonne)	—	—	—	—	—	1,983.8

(1) "Others" includes Enercan, inactive operations and non-operational provisions and reversals.

(2) Starting in 2018, certain expenses that were previously presented as General and administrative expenses and Other income and expenses, net in our income statement were reclassified as Mineral exploration and project development expenses. As a result of this change, we have adjusted our calculations of AISC.

I. INFORMATION ON THE COMPANY

BUSINESS OVERVIEW

Overview

We are a leading large-scale, low-cost integrated zinc producer with over 60 years of experience developing and operating mining and smelting assets in Latin America.

We operate and own five long-life polymetallic mines, three located in the Central Andes of Peru and two located in the state of Minas Gerais in Brazil. Our operations are large-scale, modern, mechanized underground and open pit mines. Our mines are proximately located to one another, which creates efficiencies. Two of our mines, Cerro Lindo in Peru and Vazante in Brazil, are among the top 20 largest zinc mines in the world, and, combined with our other mining operations, place us among the top five producers of mined zinc globally in 2018, according to Wood Mackenzie. In addition to zinc, which accounted for 67.1% of our mined metal production in 2018 measured on a zinc equivalent basis, we produce substantial amounts of copper, lead, silver and gold as by-products, which reduce our overall cost to produce mined zinc.

In 2018, our mining operations produced 372.8 thousand tonnes of zinc contained in concentrates, 39.0 thousand tonnes of copper contained in concentrates, 52.3 thousand tonnes of lead contained in concentrates, 7,992.2 thousand ounces of silver and 29.2 thousand ounces of gold, for a total of 555.7 thousand tonnes of metal on a zinc equivalent basis.

We also own a zinc smelter in Peru (Cajamarquilla) and two zinc smelters in Brazil (Três Marias and Juiz de Fora), which produce metallic zinc, zinc oxide and by-products. We are the fourth largest producer of refined zinc globally in 2018, according to Wood Mackenzie. Our smelters are the only zinc smelting units in Latin America (excluding Mexico), resulting in benefits from higher premiums. Cajamarquilla is the only operating zinc smelter in Peru, and the fifth largest globally in 2018 by production volume, according to Wood Mackenzie. Peru is the second largest producer of mined zinc in the world, assuring long-term supply of zinc concentrate to Cajamarquilla. Given our proximity to concentrate producers (our own mines and third-party producers), we also benefit from freight parity. Our smelters produced 607.4 thousand tonnes of refined zinc in different formats and sizes during 2018, along with by-products, including sulfuric acid, silver concentrate, copper cement and copper sulfate. Our smelters process zinc concentrate, 58.0% of which was sourced from our mines during 2018, and 42.0% purchased from third parties. Approximately 98.0% of the total volume of the contained zinc in concentrates produced by our mines was processed by our own smelters in 2018, with the remainder and all our copper and lead concentrates sold to third parties. We market our products in Latin America and globally, through our commercial offices in Luxembourg, the United States, Brazil and Peru. We also own energy assets (hydroelectric power plants) in both Brazil and Peru, which provide access to a reliable and competitive power supply.

History

We commenced operating in 1956 under the name “Companhia Mineira de Metais”, in the state of Minas Gerais, Brazil. In 1996, following a restructuring of its management model, the Votorantim Group’s industrial units were reorganized according to their business activities and geographic markets. As a result of this restructuring, Votorantim Metais S.A. was incorporated in order to manage the zinc, nickel and steel businesses. Later, the aluminum business was added, and the several entities were consolidated under one single management structure.

Starting in 2002, we began to increase our participation in the Brazilian and Peruvian zinc markets through acquisitions. We acquired Companhia Paraibuna de Metais S.A., located in Juiz de Fora (state of Minas Gerais) and the Cajamarquilla zinc smelter in Peru in 2002 and 2004, respectively. In 2005, we acquired a 19.93% stake in Compañía Minera Milpo S.A.A., later renamed Nexa Peru. Nexa Peru is one of the largest mining companies in Peru, with shares listed on the Lima Stock Exchange. By April 2016, we increased our interest in Nexa Peru to 80.23%. In October 2016, Nexa Peru launched a tender offer to repurchase its common shares through the Lima Stock Exchange, and we acquired a 2.75% equity interest in Nexa Peru’s common shares, which is currently held in treasury.

In 2014, a new corporate governance model was implemented by our controlling shareholder VSA in the corporate group. VSA took on the roles of providing guidance and portfolio management, while its subsidiaries (including us) gained autonomy. The main consequence of this new corporate model was that the new governance structure demanded a higher level of empowerment and accountability of senior management, and the establishment of a board of directors at each company. In addition, in connection with the implementation of the new corporate governance model, VSA's equity participations in Nexa CJM (formerly Votorantim Metais — Cajamarquilla S.A.) and Nexa Brazil (formerly Votorantim Metais Zinco S.A.) were transferred to Nexa Resources on June 18, 2014 and July 1, 2014, respectively.

In 2016, VSA reorganized the zinc, copper, aluminum and nickel businesses previously managed under the name Votorantim Metais S.A. The aluminum and nickel businesses of Votorantim Metais S.A. were consolidated under Companhia Brasileira de Alumínio, or CBA. The zinc and copper production units in Brazil and Peru were transferred to Nexa Resources. Following this reorganization, Nexa Resources became the holding entity solely responsible for the zinc and copper business and CBA became responsible for the aluminum and nickel businesses.

In October 2017, we completed our initial public offering and listed our common shares on the New York Stock Exchange and Toronto Stock Exchange under the ticker symbol NEXA. In connection with becoming a public company, VM Holding S.A. changed its corporate name to Nexa Resources S.A. and our subsidiaries Votorantim Metais—Cajamarquilla S.A., Votorantim Metais Zinco S.A. and Compañía Minera Milpo S.A.A. changed their corporate names to Nexa CJM, Nexa Brazil and Nexa Peru, respectively.

In 2018, our board of directors approved the beginning of construction of the Aripuanã greenfield project, an underground polymetallic project containing zinc, lead and copper, located in the state of Mato Grosso, Brazil. For additional information, please see "Information on the Company—Mining operations—Growth projects—Greenfield projects—Aripuanã."

Corporate information

Nexa Resources is a public limited liability company (*société anonyme*) incorporated under the laws of Luxembourg on February 26, 2014. Our registered office is located at 37A, Avenue J.F. Kennedy, L 1855, Luxembourg, Grand Duchy of Luxembourg, and we are registered with the Luxembourg Trade and Companies Register under number B185489. Our telephone number at this address is +352 28 26 37 27. Our main office outside of Luxembourg is located at Avenida Engenheiro Luís Carlos Berrini, nº 105, 6th floor, São Paulo, State of São Paulo, Brazil. Our website is www.nexaresources.com. None of the information available on our website is incorporated in this annual report and it should not be relied upon in deciding to invest in our common shares.

Producing mines and smelters

Our mines are:

- **Cerro Lindo.** Our Cerro Lindo mine is an underground mine located in Peru wholly-owned by Nexa Peru. Operations began in 2007 and in 2018, Cerro Lindo mine produced approximately 130.3 thousand tonnes of zinc contained in concentrates, 38.3 thousand tonnes of copper contained in concentrates, 12.8 thousand tonnes of lead contained in concentrates, 3,343.5 thousand ounces of silver contained in concentrates and 4.1 thousand ounces of gold contained in concentrates. The ore is treated at a concentrate plant that has a processing capacity to 21.0 thousand tonnes of ore per day.
- **El Porvenir.** Our El Porvenir mine is an underground mine located in Peru wholly-owned by Nexa Resources El Porvenir S.A.C. Operations began in 1949, and in 2018, El Porvenir mine produced approximately 57.9 thousand tonnes of zinc contained in concentrates, 567.0 tonnes of copper contained in concentrates, 16.6 thousand tonnes of lead contained in concentrates, 2,533.8 thousand ounces of silver contained in concentrates and 9.7 thousand ounces of gold contained in concentrates. The ore is treated at a concentrate plant that has a processing capacity of 6.5 thousand tonnes of ore per day. Our El Porvenir and Atacocha mines are currently undergoing an integration process. Three phases, including administration, tailing disposal and energy transmission of the integration process, were completed; however, our management committee is evaluating the implementation strategies of this project, after which we expect to proceed to the final stage, which includes the integration of the underground operations and underground facilities at the two mines.

- **Atacocha.** The Atacocha mine is an underground and open pit mine located in Peru wholly-owned by Nexa Resources Atacocha S.A.A. (formerly Compañía Minera Atacocha). Operations began in 1938 and in 2018, Atacocha mine produced approximately 17.3 thousand tonnes of zinc contained in concentrates, 125.0 tonnes of copper contained in concentrates, 15.6 thousand tonnes of lead contained in concentrates, 1,678.9 thousand ounces of silver contained in concentrates and 15.4 thousand ounces of gold contained in concentrates. The ore is treated at a concentrate plant that has a processing capacity of 4.5 thousand tonnes of ore per day. As mentioned above, our El Porvenir and Atacocha units are currently undergoing an integration process. Three phases, including administration, tailing disposal and energy transmission of the integration process, were completed; however, our management committee is evaluating the implementation strategies of this project, after which we expect to proceed to the final stage, which includes the integration of the underground operations and underground facilities at the two mines.
- **Vazante.** Our Vazante mine is an underground and open pit mine located in Brazil wholly-owned by Nexa Brazil. Operations began in 1969 and in 2018, Vazante mine produced approximately 140.8 thousand tonnes of zinc contained in concentrates, 1,180.0 tonnes of lead contained in concentrates and 380.2 thousand ounces of silver contained in concentrates. The ore is treated at a concentrate plant that has a processing capacity of 4.1 thousand tonnes of ore per day.
- **Morro Agudo.** Our Morro Agudo project includes an underground and open pit mine located in Brazil wholly-owned by Nexa Brazil. Operations began in 1988 and in 2018, Morro Agudo mine produced approximately 26.4 thousand tonnes of zinc contained in concentrates, 6.1 thousand tonnes of lead contained in concentrates and 55.7 thousand ounces of silver contained in concentrates. The mill feed material is treated at a concentrate plant that has a processing capacity of 3.4 thousand tonnes per day.

Our smelters are:

- **Cajamarquilla.** Our Cajamarquilla smelter, which is wholly-owned by Nexa CJM, is located in Peru and began operating in 1981. It is currently the largest zinc smelter in Latin America and the fifth largest zinc smelter in the world in 2018, according to Wood Mackenzie. Cajamarquilla uses Roast Leach Electrowin technology. With a nominal production capacity of 338.2 thousand tonnes per year, Cajamarquilla produced 330.1 thousand tonnes in 2018 and 309.9 thousand tonnes in 2017. In 2018, 38.1% of the zinc contained in concentrates used by Cajamarquilla was sourced from our mines in Peru and 61.9% was purchased from third parties.
- **Três Marias.** Our Três Marias smelter, which is wholly-owned by Nexa Brazil, is located in Brazil and began operating in 1969. Três Marias processes zinc silicate concentrate from our Vazante mine and zinc sulfide concentrate from our Morro Agudo mine and uses Roast Leach Electrowin technology. With a nominal production capacity of 190.0 thousand tonnes per year, Três Marias produced 186.7 thousand tonnes of zinc in 2018 and 185.8 thousand tonnes of zinc in 2017. In 2018, 91.9% of the zinc contained in raw materials used by Três Marias was sourced from our mining operations in Brazil and Peru and 8.1% was purchased from third parties.
- **Juiz de Fora.** Our Juiz de Fora smelter, which is wholly-owned by Nexa Brazil, is located in Brazil and began operating in 1980. This smelter uses Roast Leach Electrowin and Waelz Furnace technologies. With a nominal production capacity of 94.1 thousand tonnes per year, Juiz de Fora produced 90.6 thousand and 87.3 thousand tonnes of zinc in 2018 and 2017, respectively. In 2018, 47.1% of the zinc contained in raw materials used by Juiz de Fora was zinc concentrate sourced from our mining operations, 33.1% was purchased from third parties and 19.8% was obtained from secondary feed materials from electric arc furnace (EAF) and brass oxide. Of the zinc contained in concentrates used by Juiz de Fora, 58.7% was sourced from our mines and 41.3% was purchased from third parties.

In addition to our mines and smelters, we have interests in five greenfield mining projects in Peru (Shalipayco, Magistral, Hilarión, Pukaqaqa and Florida Canyon Zinc) and two in Brazil (Aripuanã and Caçapava do Sul). For more information about these projects, please see “Information on the Company—Mining operations—Growth projects.”

Principal subsidiaries

Nexa CJM

As of December 31, 2018, Nexa Resources is the beneficial owner of 99.9164% of the outstanding shares of Nexa CJM, and the remaining outstanding shares are owned by Votorantim Investimentos Latino-Americanos S.A. (VILA) with 0.082557% and by other minority shareholders holding 0.001% in aggregate.

Nexa Peru

As of December 31, 2018, Nexa Peru's share capital consists of 1,309,748,288 common shares. In addition to common shares, Nexa Peru has issued investment shares that represent a participation in its net worth (*patrimonio*). Although the investment shares do not represent a participation in the capital of the company nor grant any voting rights, they grant their holders the right, among others, to participate in any dividend distributions and liquidation proceeds, pro rata to the percentage they represent in the total net worth of Nexa Peru; as well as to participate in any capital increases (in order to maintain the participation they represent in the total net worth) and the right to have their shares redeemed in certain circumstances. As of December 31, 2018, approximately 67.0% of the investment shares are free float and 33.0% are treasury shares. The investment shares currently represent 1.6% of the total shares of Nexa Peru.

Both the common shares and the investment shares of Nexa Peru are registered with the Peruvian Public Registry of Securities (*Registro Público del Mercado de Valores*) and listed on the Lima Stock Exchange. As a result, Nexa Peru is required to comply with certain disclosure obligations such as filing quarterly and annual financial statements, reporting on material events (*hechos de importancia*) and disclosing information regarding the economic group to which it belongs.

The following table sets forth information concerning the ownership of the capital stock of Nexa Peru.

Shareholder	Number	Share Capital (%)
Nexa CJM	1,048,621,896	80.06%
Nexa Resources	2,277,601	0.17%
Public float	206,854,856	15.79%
Treasury shares	51,993,935	3.97%
Total	1,309,748,288	100.0%

Nexa Brazil

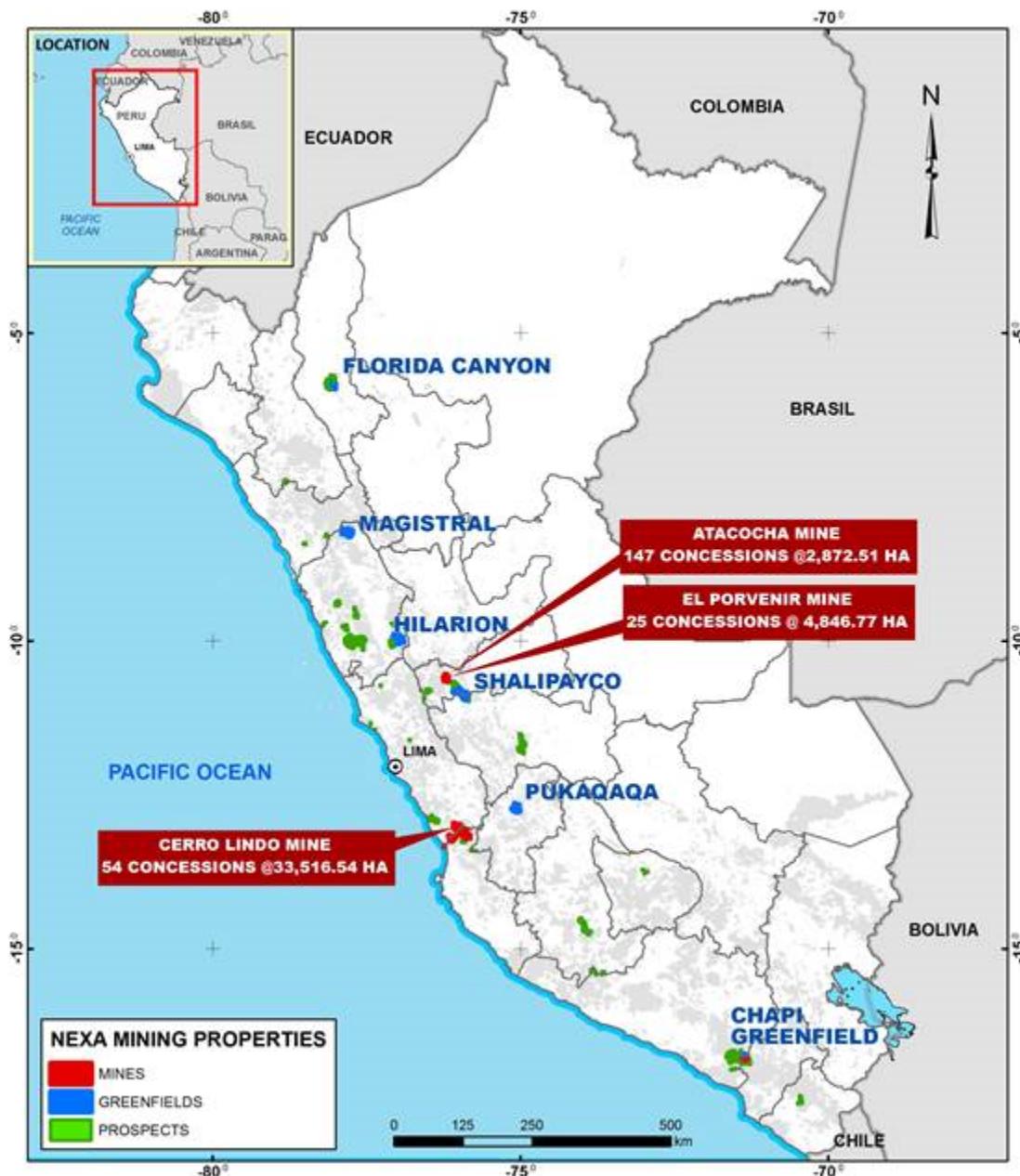
As of December 31, 2018, Nexa Resources is the beneficial owner of 94.01% of the outstanding shares of Nexa Brazil, and VSA is the beneficial owner of the remaining 5.99%. For accounting purposes, Nexa Resources holds 100% of the share capital of Nexa Brazil, which reflects the final result of implementation of all steps of the transaction regarding our energy assets. The transaction regarding our energy assets was approved by the Brazilian Electric Energy Regulatory Authority (*Agência Nacional de Energia Elétrica*), or ANEEL, in September 2018. Nexa Resources has recognized the energy assets for all the years presented in the consolidated financial statements due to the accounting policy for common control transactions. See Note 12 to our consolidated financial statements and "Related Party Transactions—Certain transactions with our shareholders and their affiliates."

VGmbH

During 2018, we started the process of liquidating our subsidiary Votorantim GmbH, or VGmbH. We expect the liquidation to conclude in the first half of 2019.

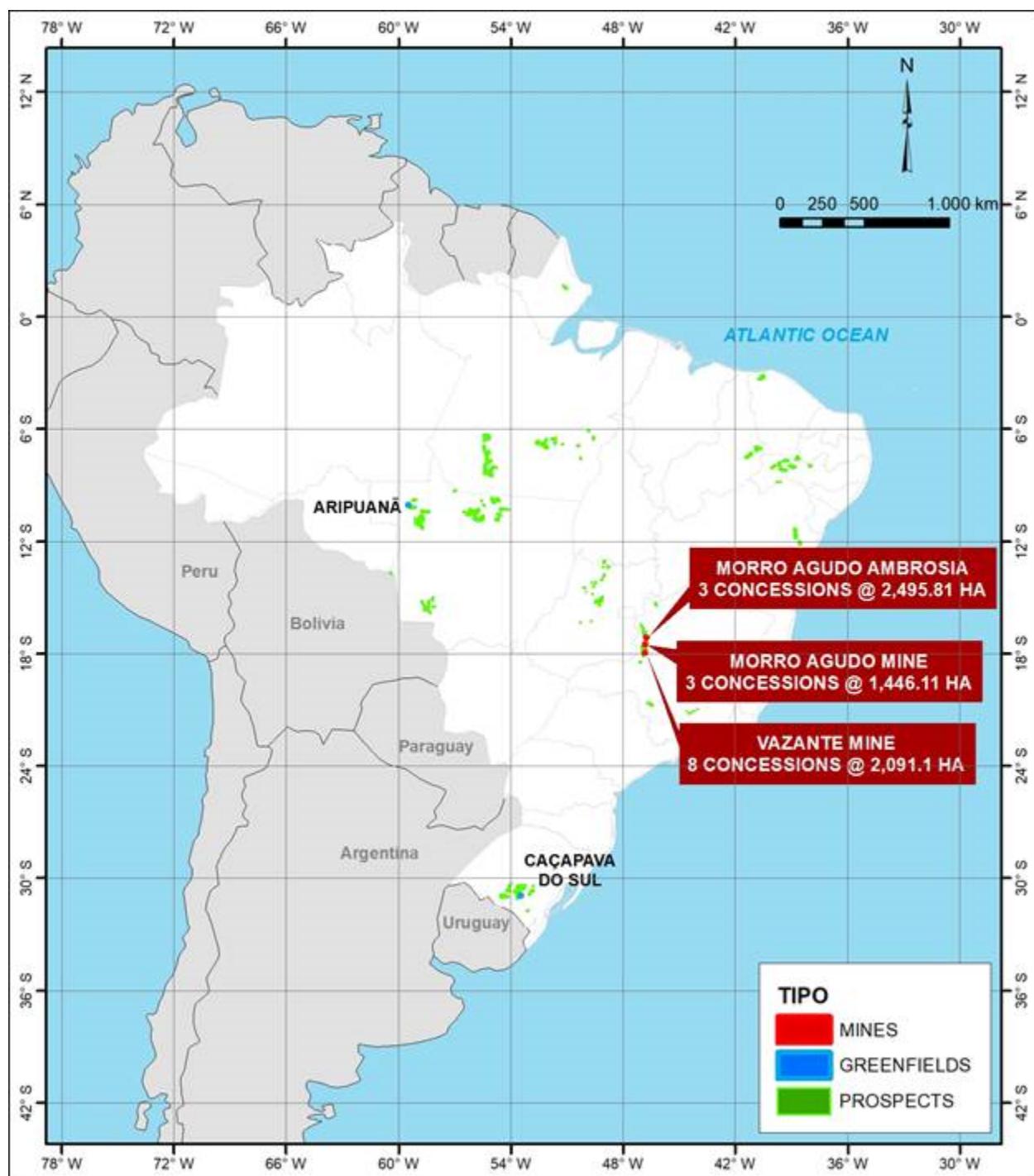
MINING OPERATIONS

Map 1. Mines, Projects and Prospects in Peru



Source: Nexa Resources.

Map 2. Mines, Projects and Prospects in Brazil



Source: Nexa Resources.

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Mining Operations

The following table summarizes our concentrate production, metal contained in concentrate production, zinc equivalent production in each metal and zinc equivalent production in each of our mines

To calculate the zinc equivalent production for the years ended December 31 2018, 2017 and 2016, we convert the relevant metal contained in concentrate production used in the zinc equivalent grade based on the average benchmark prices for 2018, namely, US\$2,921.95 per tonne (US\$1.33 per pound) for zinc, US\$6,523.04 per tonne (US\$2.96 per pound) for copper, US\$2,242.43 per tonne (US\$1.02 per pound) for lead, US\$15.71 per ounce for silver and US\$1,268.49 per ounce for gold.

	For the Year Ended December 31,		
	2018	2017	2016
Mining Production			
Zinc concentrates (in tonnes)	794,519	791,583	860,400
Copper concentrates (in tonnes)	148,987	169,582	158,503
Lead concentrates (in tonnes)	96,093	96,006	104,409
Mining Production—Metal Contained in Concentrate			
Zinc (in tonnes)	372,793	375,402	416,869
Copper (in tonnes)	39,029	44,161	41,551
Lead (in tonnes)	52,267	52,572	59,181
Silver (in oz.) ⁽¹⁾	7,992,167	7,945,778	8,539,568
Gold (in oz.)	29,224	32,534	27,893
Mining Production—Zinc Equivalent Production			
Zinc (in tonnes of zinc equivalents)	372,793	375,402	416,869
Copper (in tonnes of zinc equivalents)	87,130	94,026	88,471
Lead (in tonnes of zinc equivalents)	40,117	42,071	47,359
Silver (in tonnes of zinc equivalents)	42,958	46,776	50,271
Gold (in tonnes of zinc equivalents)	12,687	14,123	12,109
Total	555,685	572,398	615,079
Mining Production—Zinc Equivalent Production			
Cerro Lindo (in tonnes of zinc equivalents)	245,492	283,208	296,007
El Porvenir (in tonnes of zinc equivalents)	89,722	76,590	97,570
Atacocha (in tonnes of zinc equivalents)	45,293	48,591	54,770
Vazante (in tonnes of zinc equivalents)	143,792	138,395	137,535
Morro Agudo (in tonnes of zinc equivalents)	25,424	25,614	29,197
Total	555,685	572,398	615,079

(1) Silver volumes include silver in lead concentrate produced in Vazante.

The following table summarizes the average ore grade for the periods indicated.

	For the Year Ended December 31,		
	2018	2017	2016
Average Ore Grade			
Zinc (%)	3.27	3.30	3.47
Copper (%)	0.38	0.42	0.40
Lead (%)	0.53	0.53	0.57
Silver (in grams per tonne)	28.45	27.99	29.24
Gold (in grams per tonne)	0.13	0.31	0.31

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Mining Operations

Each mine consists of one mine, one treatment plant and related infrastructure as summarized in the following table and further described below.

Mining Unit	Type of Mine	Treatment Plant Capacity
Cerro Lindo ⁽¹⁾	Underground / Polymetallic	21,000 tonnes of ore per day
El Porvenir	Underground / Polymetallic	6,500 tonnes of ore per day
Atacocha	Underground and Open Pit / Polymetallic	4,500 tonnes of ore per day
Vazante	Underground and Open Pit / Polymetallic	4,100 tonnes of ore per day
Morro Agudo	Underground and Open Pit/ Polymetallic	3,400 tonnes of mill feed per day

- (1) The Cerro Lindo unit has an authorized capacity of 20,000 tonnes of ore per day, but Peruvian law allows units to operate at a capacity 5.0% higher than its authorized capacity.

We summarize below certain production information as of December 31, 2018 for each of our five mines.

Cerro Lindo

Location and means of access

The Cerro Lindo mine is an underground mine located in the Chavín District, Chincha Province, Peru, approximately 268 km southeast of Lima and 60 km from the coast. Access from Lima is available via the paved Pan American Highway south to Chincha, and then via an unpaved road up the Topará River valley to the mine site. Internal roadways connect the various mine-site components. The project site is located at an average elevation of 2,000 meters above sea level.

History

Several companies have held interests in the Cerro Lindo mine area, including BTX, Phelps Dodge, and Nexa Peru. Exploration work completed to date includes geological mapping, rock chip and soil sampling, trenching, ground geophysical surveys, and exploration, definition and underground operational core drilling. Feasibility studies were completed in 2002 and 2005, with mine construction commencing in 2006. Formal production started in 2007, and the mine has been operational since that date.

Title, leases and options

All mineral concessions are held in the name of Nexa Peru. The tenure consists of 54 mining concessions and one beneficiation concession, totaling approximately 33,516.54 hectares. Certain mineral concessions are currently subject to a penalty of US\$20/hectare since the minimum required levels of production or exploration expenditures stipulated under Peruvian regulations have not been met.

Nexa Peru currently holds surface rights or easements for the following infrastructure at Cerro Lindo: the mine site, access roads, power transmission lines, a water pipeline for the mine, a desalination plant, a water process plant and a water pipeline from the desalination plant to the mine site. There is sufficient suitable land available within the mineral tenure held by Nexa Peru for tailings disposal, mine waste disposal and installations such as the process plant and related mine infrastructure.

Cerro Lindo is not currently subject to mining royalties. When the current tax stability agreement expires in 2021, Nexa Peru will be required to pay levies to the Peruvian government for 2022. For more information, see “Information on the Company—Regulatory matters—Peruvian regulatory framework.” As of December 31, 2018, Nexa Peru has a total of six water licenses, one for use of seawater, and the remaining five for ground water extraction.

Mineralization

Cerro Lindo is classified as a volcanogenic massive sulfide (or VMS) deposit. The Cerro Lindo deposit is 1,500 meters long, 1,000 meters wide, and has a current vertical development of 470 meters below the surface. Mineralization consists of at least 10 discrete mineralized zones. The Cerro Lindo deposit comprises lens-shaped

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Mining Operations

massive bodies, composed of pyrite (50.0% to 90.0%), yellow sphalerite, brown sphalerite, chalcopyrite, and minor galena. Significant barite is present mainly in the upper portions of the deposit. A secondary-enrichment zone, composed of chalcocite and covellite, has formed near the surface where massive sulfides have oxidized. Silver-rich powdery barite remains at the surface as a relic of sulfide oxidation and leaching.

Operations and infrastructure

The Cerro Lindo mine is completely mechanized, using rubber-tired equipment for all development and production operations. There is no shaft; all access is through 15 portals servicing adits, drifts and declines. Ore is extracted from nine separate ore bodies and delivered to the process plant via a series of conveyors. All ore is commingled during transport to the concentrator stockpile; ore from different ore bodies is not segregated.

We have completed construction of all key infrastructure required for mining and processing operations, including the underground mine, access roads, power lines, water pipelines, the desalination plant, offices and warehouses, accommodations, the process plant/concentrator, conveyor systems, waste rock facilities, temporary ore stockpiles, the paste-fill plant and the dry-stack tailings storage facilities. A new fresh water pipeline from the desalination plant on the coast to the mine is projected to be completed during 2019. The national grid supplies electrical power for the mine site. During 2018, we completed approximately 57 km of diamond drilling. We began drilling activities in the Orcocobre region, north of the Topara River and two km from the Cerro Lindo mine. By the end of 2018, we drilled seven km in 11 diamond drill holes in the Orcocobre region. We have detected hydrothermal alteration and marginal mineralization. Both are characteristic of a VMS system, the same type of mineralization found at the Cerro Lindo mine. All our discovered deposits are currently located south of the Topara River. During 2019, we expect to complete a total of 53 km of diamond drilling, including 20 km of exploratory drilling. In 2018, we spent US\$25.9 million on sustaining capital expenditures for this property, primarily associated with major infrastructure and equipment replacement.

Production

The table below summarizes the Cerro Lindo mine's concentrate production, metal contained in concentrates produced and average grades for the periods indicated.

	As of and for the Year Ended December 31,		
	2018	2017	2016
Treatment Ore (in tonnes)	6,914,653	7,297,624	7,345,201
Average Ore Grade			
Zinc (%)	2.07	2.33	2.56
Copper (%)	0.64	0.69	0.66
Lead (%)	0.25	0.27	0.29
Silver (grams per tonne)	21.42	21.55	22.64
Gold (grams per tonne)	—	—	—
Concentrate Production			
Zinc concentrates (in tonnes)	221,001	264,377	295,082
Copper concentrates (in tonnes)	145,685	166,595	154,362
Lead concentrates (in tonnes)	19,929	22,791	24,526
Metal Contained in Concentrates Production			
Zinc (in tonnes)	130,349	155,950	173,808
Copper (in tonnes)	38,338	43,568	40,636
Lead (in tonnes)	12,761	14,837	15,834
Silver (in oz.)	3,343,551	3,545,824	3,598,294
Gold (in oz.)	4,129	4,022	4,199
Cash Cost, After By-Product Credits (in US\$/tonne)	(50.4)	(188.6)	259.1

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	As of and for the Year Ended December 31,		
	2018	2017	2016
Cash Cost, After By-Product Credits (in US\$/lb.)	(0.02)	(0.09)	0.12
Capital Expenditures (in millions of US\$)	25.9	7.5	18.7

El Porvenir

Location and means of access

The El Porvenir mine is an underground mine located in the district of San Francisco de Asís de Yarusyacán, in the province of Pasco, Peru. The property is located in the central Andes mountains region of Peru, at approximately 4,200 meters above sea level. The mine is situated at kilometer 340 of the Carretera Central Highway (Lima—Huánuco route), 13 km from the city of Cerro de Pasco. The mine is located in the Central Cordillera zone, which contains the communities of Parán, Lacsanga and Santo Domingo de Apache.

History

The El Porvenir mine began its operation as small-scale artisanal mine in 1949. In 1953, a gravity separation plant was built with a capacity of 54,000 t/month of minerals with an average grade of 160 g/t of silver, 4.3% of lead and 6.5% of zinc, which was expanded successively until 1978. In 1979, we completed the construction of a flotation plant with the capacity to process 1,800 ktpd and the ability to increase such capacity to 2,700 ktpd. The flotation plant includes electronically-controlled material transport/elevation, crushing circuits and ore concentrator systems. In 1997, we discovered a new mineralization zone. In 1999, production increased to 3,000 ktpd. In 2012, production further increased to 5,600 ktpd. In 2013, we commenced the integration process with the Atacocha mine. In 2015, as part of the second stage of integration, the El Porvenir tailings deposit was integrated with Atacocha's. In 2016, we began integration of the energy supply between the two mines, which was the third stage of integration.

As of December 31, 2018, we are in the process of integrating our El Porvenir and Atacocha mine operations. For additional information on the integration of the El Porvenir and Atacocha mines, see “Information on the Company—Mining operations—Growth projects—Brownfield and integration projects—Pasco mining complex” below.

Title, leases and options

The El Porvenir mine is owned by Milpo Andina Peru, S.A.C., a subsidiary of Nexa Peru in which Nexa Peru has a 99.99% equity interest. The El Porvenir mine has a total of 25 concessions covering approximately 4,846.77 hectares, as well as a beneficiation plant, “Acumulacion Aquiles 101.” With respect to the surface property at the El Porvenir project, there is a mining site of 450.80 hectares, where the mining concession is located, as well as additional surface property where tailings dams/ponds, camps sites and other ancillary infrastructure are located.

Mining operations at the El Porvenir mine are subject to certain royalties payable by Nexa Resources El Porvenir S.A.C. For more information, see “Information on the Company—Regulatory matters—Peruvian regulatory framework—Royalties and other taxes on mining activities.”

Mineralization

The El Porvenir mine is a typical skarn deposit. The mineralization occurs within the contact of the upper Triassic limestone (*i.e.*, exoskarn) and the granodioritic-dacitic intrusive rocks (*i.e.*, endoskarn). There are also recognized veins and replacement manto type, minor disseminated mineralization may occur within the intrusive units. West of the Milpo-Atacocha fault within the Goyllarisquizga Group, mineralization is characterized as veins and disseminations.

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Four groups of vein/mineralized structures are reported. Structurally controlled veins are sub-vertical up to 150 meters long, with a vertical extent of 350 meters. Economic mineralogy is mostly comprised of galena, sphalerite, and tetrahedrite, as well as variable and lesser pyrite, quartz and rhodochrosite.

Operations and infrastructure

Most of the exploration is generally conducted simultaneously with underground development, which involves diamond core drilling and channel sampling following underground drifting.

The El Porvenir project site consists of an underground mine, tailings pond, waste rock stockpiles, a process facility with associated laboratory and maintenance facilities; maintenance buildings for underground and surface equipment. Facilities and structures include a warehouse, office, change house facilities, main shaft, ventilation shaft, backfill plant, explosives storage area, hydroelectric power generation, power lines and substation, fuel storage tanks, a warehouse and laydown area and a permanent accommodation camp.

The electrical power supply for the project comes from two sources: connection to the SEIN national power grid by a main substation located near the site, and the Candelaria Hydro, which consists of three turbines connected to the project through the main substation by a transmission line. All other loads of the project are fed from the main substation through overhead power lines. These power lines are used to deliver power to various locations to support activities during operation of the mine.

Site roads include main roads suitable for use by mining trucks that transport concentrates to Lima and service roads for use by smaller vehicles. The site roads are used by authorized mine personnel and equipment, with access controlled by Nexa Peru. An approximately 15 to 20 kilometer network of service roads was constructed to provide access to the underground mine, processing plant, tailings facility, waste rock stockpile, mine offices, workshops, mine camps and other surface infrastructure.

In 2018, we spent US\$25.6 million on sustaining capital expenditures for this property, primarily associated with mine development, equipment replacement and other major infrastructure.

Production

The table below summarizes the El Porvenir mine's concentrate production, metal contained in concentrates produced and average grades for the periods indicated.

	As of and for the Year Ended December 31,		
	2018	2017	2016
Treatment Ore (in tonnes)	2,149,927	1,834,511	2,154,151
Average Ore Grade			
Zinc (%)	3.04	2.86	3.22
Copper (%)	0.15	0.13	0.14
Lead (%)	0.98	1.04	0.99
Silver (grams per tonne)	59.68	63.61	60.24
Gold (grams per tonne)	0.46	0.48	0.50
Concentrate Production			
Zinc concentrates (in tonnes)	115,256	92,446	121,204
Copper concentrates (in tonnes)	2,701	2,460	2,950
Lead concentrates (in tonnes)	31,662	28,726	31,209
Metal Contained in Concentrate Production			
Zinc (in tonnes)	57,872	46,154	62,534
Copper (in tonnes)	567	493	653
Lead (in tonnes)	16,641	14,818	17,164
Silver (in oz.)	2,533,801	2,357,442	2,715,143
Gold (in oz.)	9,664	8,408	9,043
Cash Cost, After By-Product Credits (in US\$/tonne)	1,192.9	1,210.2	828.4
Cash Cost, After By-Product Credits (in US\$/lb.)	0.54	0.55	0.38
Capital Expenditures (in millions of US\$)	25.6	19.8	35.7

Atacocha

Location and means of access

The Atacocha mine is an underground mine and open pit mine located in the district of San Francisco de Asís de Yarusyacán, in the province of Pasco, Peru. The property is located in the central Andes mountains region of Peru, at approximately 4,200 meters above sea level. The mine is situated at kilometer 324 of the Carretera Central Highway (Lima—Huánuco route), 16 km from the city of Cerro de Pasco. The Atacocha mine is located in a mountain area of Central Peru. The processing plant is located near the Huallaga River valley. Cerro de Pasco and Huánuco cities are connected to the mine area by a paved road with heavy traffic. Atacocha has mine camps near the plant and the valley. Light fuel maintenance and storage facilities are located in the area. Basic supplies are available in the city of Chiricin, with most major items and equipment provided from Lima.

History

The Atacocha mining unit began operating in the early 20th century with a production of lead, silver, zinc and copper ores. In 1925, the Pucayacu Mining Company exploited Atacocha until the company was liquidated and the property was declared abandoned. Subsequently, the “Casa Gallo Hermanos” enterprise claimed the Atacocha mines and began working the property in 1928. In 1935, Francisco Jose Gallo Diez, with the collaboration of Eulogio E. Fernandini, German Aguirre and Gino Salocchi, established Atacocha S.A. On February 8, 1936, Compañía Minera Atacocha S.A.A. was incorporated to develop exploration and exploitation of mining sites and produce lead, zinc and copper concentrates.

Nexa Peru has been conducting exploration and development work at Atacocha since 1949. Most exploration is conducted simultaneously with underground development, which involves diamond core drilling, and channel sampling following underground drifting. Prior to 1997, minor and sporadic drilling was completed; no channel sampling is documented before 2001. Systematic underground geological mapping is completed at scale of either 1:500 or 1:250, following underground development on all levels and sub-levels. A total of 29 underground levels have been developed at Atacocha, with additional development on sub-levels. Geological mapping is drawn on paper in the field by the mine/production geologists, and subsequently digitized with the help of a modelling assistant. The geological level plan maps are updated and incorporated in a three-dimensional geological model on a daily basis to aid future exploration and mine development planning.

Title, leases and options

The Atacocha mine is owned by Nexa Resources Atacocha S.A.A., which is controlled by Nexa Peru. The Atacocha mine has a total of 147 concessions covering approximately 2,872.51 hectares, as well as a beneficiation plant, “Chiricin N° 2.” With respect to the surface property at the Atacocha project, there is a mining site of 1,343 hectares, where the mining concession is located, as well as additional surface property where tailings dams/ponds, camps sites and other ancillary infrastructure are located. There are royalties payable in respect of mining operations at the Atacocha project for the mining concessions held by Nexa Resources Atacocha S.A.A. For more information, see “Information on the Company—Regulatory matters—Peruvian regulatory framework—Royalties and other taxes on mining activities.”

Mineralization

At Atacocha, mineralization is characterized as either skarn-related mineralization, replacement mineralization, or hydrothermal vein/breccia-style mineralization. Skarn-related mineralization is characterized by pyrite, chalcopyrite, sphalerite, galena, with lesser bismuthinite and a variety of sulfosalts (Bi-bearing) and pyrrhotite, bornite, and covellite at lower elevation. Molybdenite may occur proximate to the skarn-related

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mineralization. Elevated Bi and Au are reported to be associated with skarn-related mineralization. Veins and veinlets with pyrite, chalcopyrite, sphalerite, galena, with quartz and carbonate occur within marble units, and are spatially associated with skarn bodies. Replacement bodies comprising of pyrite, sphalerite, galena, chalcopyrite, and possibly other fine undistinguished sulfides occur within garnet-skarn, marble, and silicified zones.

Atacocha does not currently have any estimated mineral reserves under Industry Guide 7.

Operations and infrastructure

Atacocha operates two mines: the Atacocha underground mine and the San Gerardo open pit mine. The operation is currently mining ore from both the Atacocha underground mine and the San Gerardo open pit mine. Both mining operations feed the Atacocha processing plant.

The Atacocha site also includes older tailings ponds, waste rock stockpiles, a process plant facility with associated laboratory and maintenance facilities, and maintenance buildings for underground and surface equipment. Facilities and structures include: a warehouse, mine office, change house, tailings pumping station, main shaft, ventilation shaft, mine access ramps, main haulage drift (level 3600), backfill plant, explosives storage area, hydroelectric power generation, power lines and substation, fuel storage tanks and a permanent accommodation camp. Currently, Atacocha tailings are disposed at the El Porvenir tailings pond.

In 2018, we spent US\$16.9 million on sustaining capital expenditures for this property, primarily associated with mine development, equipment replacement and other major infrastructure.

Production

The table below summarizes the Atacocha mine's concentrate production, metal contained in concentrates produced and average grades for the periods indicated.

	As of and for the Year Ended December 31,		
	2018	2017	2016
Treatment Ore (in tonnes)	1,551,472	1,506,826	1,487,390
Average Ore Grade			
Zinc (%)	1.43	1.43	1.80
Copper (%)	0.10	0.09	0.11
Lead (%)	1.18	1.22	1.32
Silver (grams per tonne)	44.04	44.52	53.21
Gold (grams per tonne)	0.47	0.60	0.54
Concentrate Production			
Zinc concentrates (in tonnes)	34,654	32,995	42,356
Copper concentrates (in tonnes)	601	528	1,191
Lead concentrates (in tonnes)	28,207	28,614	29,585
Metal Contained in Concentrate Production			
Zinc (in tonnes)	17,323	16,950	22,330
Copper (in tonnes)	125	99	262
Lead (in tonnes)	15,595	15,958	17,167
Silver (in oz.)	1,678,920	1,687,016	2,001,778
Gold (in oz.)	15,431	20,105	14,651
Cash Cost, After By-Product Credits (in US\$/tonne)	1,115.5	(191.1)	684.9
Cash Cost, After By-Product Credits (in US\$/lb.)	0.51	(0.09)	0.31
Capital Expenditures (in millions of US\$)	16.9	5.9	7.7

Vazante

Location and means of access

The Vazante mine is an underground and open pit mine located about seven km from the municipality of Vazante, in the state of Minas Gerais, Brazil. The project area has elevations ranging from 690 to 970 meters above sea level. Access from Brasilia is via federal highway BR-040 toward Paracatu. Internal roadways connect the various mine-site components. Concentrates are trucked about 250 km to the Três Marias smelter. The closest commercial airport is located in Brasilia. The Vazante municipal airport for light aircraft is adjacent to the mine site.

History

Mineralization was initially exploited by artisanal miners during the 1950s. Mechanized open pit mining and underground mining commenced in 1969 and 1983, respectively. The current primary ore types mined are hydrothermal zinc silicates and willemite. Initial mining operations exploited supergene calamine ores and a mixture of the zinc secondary minerals hemimorphite and smithsonite, which are derived from the weathering of silicate ore.

Title, leases and options

Nexa Brazil owns 100.0% of the Vazante project. Mineral concessions are divided into core tenements, where the known mineral deposits are located and where we have active mining operations, and the surrounding exploration concessions. The Company holds eight mining concessions in the core tenements that have a total area of approximately 2,091.10 hectares, which host the active mining operations. The Company also holds seven exploration applications (approximately 735.39 hectares), 54 exploration authorizations (approximately 43,316.55 hectares), and one mining concession application (approximately 189.98 hectares). These amount to 44,241.87 hectares in addition to core tenements.

Nexa Brazil holds surface rights sufficient to support the current operations. Some surface rights agreements require annual payments to the owners. Three easements have been granted in support of the mining activities. There is sufficient suitable land available within the mineral tenure held by Nexa Brazil for tailings disposal, mine waste disposal, and installations such as the process plant and related mine infrastructure.

Brazilian companies that hold mining concessions are subject to a royalty payment imposed by the National Mining Agency. For more information, see “Information on the Company—Regulatory matters—Brazilian regulatory framework—Royalties and other taxes on mining activities.”

Nexa Brazil holds six licenses for water usage for the operations. Nexa Brazil has lodged renewal applications, where applicable, for the water licenses in use.

Mineralization

The Vazante and Extremo Norte zinc deposits are epigenetic zinc silicate deposits, and Vazante is one of the largest deposits of its type worldwide. Mineralization exists within a sequence of pelitic carbonate rocks belonging to the Serra do Poço Verde formation of the Vazante group. The major structural control is the Vazante fault.

We are conducting ongoing tests to explore extensions of known mineralizations, infilling areas where no data are currently available, and identifying other areas where mineralization may be present. Examples of exploration successes using these methods within the Vazante mine area include our projects Lumiadeira, Ramp 29, and Deep Exploration.

Operations and infrastructure

Exploration conducted in the Vazante project area to date has included: geological mapping; rock, pan concentrate, stream sediment and soil sampling; airborne and ground magnetic surveys; auger drilling; and core drilling. Production drilling operations have been performed by company personnel using a variety of drilling machines throughout the history of the Vazante mine.

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The Vazante underground mine has been in operation since 1983 and is a fully mechanized mine using rubber-tired diesel equipment for development and production activities. Access is through two portals for Vazante and one portal for Extremo Norte. As development progresses at Extremo Norte, a connecting drift will be established from Vazante to Extremo Norte.

All infrastructure required for the current mining and processing operations has been constructed and is operational. This includes the underground mines, access roads, power lines, water pipelines, offices and warehouses, a process plant/concentrator, conveyor systems, waste rock facilities, temporary ore stockpiles, paste-fill plants, and tailings storage facilities.

The state grid supplies electrical power for the Vazante mine site. Two independent transmission lines feed the site. An additional 60 MW power transmission line is currently under development and will be completed by 2021. Two diesel generators can provide backup power in case of a power failure.

In 2018, we spent US\$89.9 million on the life of mine extension, and the expansion, maintenance and modernization of this property, including the development and maintenance of plant and equipment.

In order to support the increase in mine production, we plan to install a vertimill in our Vazante mine. As of April 2018, the process for implementing a vertimill in our Vazante plant has been temporarily put on hold as new studies are conducted to assess its grinding circuit.

Production

The table below summarizes the Vazante mine's concentrate production, metal contained in concentrates produced and average grades for the periods indicated.

	As of and for the Year Ended December 31,		
	2018	2017	2016
Treatment Ore (in tonnes)	1,374,380	1,321,240	1,381,301
Average Ore Grade			
Zinc (%)	12.13	12.30	11.35
Lead (%)	0.34	0.34	0.31
Silver (grams per tonne)	19.14	17.27	13.19
Concentrate Production			
Zinc concentrates (in tonnes)	357,353	348,760	343,754
Lead concentrates (in tonnes)	4,450	4,542	3,074
Metal Contained in Concentrate Production			
Zinc (in tonnes)	140,842	135,379	135,509
Lead (in tonnes)	1,180	1,153	881
Silver (in oz.)	380,190	355,496	224,353
Cash Cost, After By-Product Credits (in US\$/tonne)	834.5	965.3	997.7
Cash Cost, After By-Product Credits (in US\$/lb.)	0.38	0.44	0.45
Capital Expenditures (in millions of US\$)	89.9	55.3	34.2

Morro Agudo

Location and means of access

The Morro Agudo project consists of an underground mine and open pit mine, as well as three deposits along what is known as the Ambrosia Trend (Ambrosia Sul, Ambrosia Norte, and Bonsucesso). The Morro Agudo mine site is situated on Traíras Farm, about 45 km south of the municipality of Paracatu, Brazil. The mine access from Paracatu is via the BR-040 highway. The Ambrosia Trend deposits are situated about 15 to 20 km northeast of Paracatu. Access is via the MG-188 highway to the village of Santo Antônio.

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Mining Operations

History

Modern underground mining commenced in 1988 at the Morro Agudo mine. The Ambrosia Norte deposit was discovered in 1973, Ambrosia Sul in 2011, and Bonsucesso in 2014. Mining of the Ambrosia Sul deposit commenced in 2017.

Title, leases and options

Nexa Brazil owns 100.0% of the Morro Agudo project. The total Morro Agudo project area is about 80 km long and 10 km wide at the widest extent and covers a significant strike extent of the lithologies that host mineralization at the Morro Agudo mine and along the Ambrosia Trend. Nexa Brazil holds two granted mining concessions in the Morro Agudo mine area of approximately 827.61 hectares, with a valid mining concession application for an additional area of approximately 618.50 hectares. In the Ambrosia Trend area, Nexa Brazil has one granted mining concession (999.33 hectares), and two mining concession applications (1,496.48 hectares).

Mineralization

The Morro Agudo and Ambrosia Trend deposits are classified as examples of Irish-style sedimentary hosted deposits. Mineralization is hosted within a sequence of pelitic carbonate rocks belonging to the Morro do Calcário Formation that is part of the regional Vazante group. The deposits occur on the Brasília Fold Belt.

Both oxide and sulfide mineralization have developed in the Morro Agudo and Ambrosia Trend deposits. Oxide mineralization is primarily in the form of smithsonite and cerussite. Sulfide mineralization is primarily sphalerite and galena. The geological setting and understanding of the mineralization setting are adequately known to support mineral resource and mineralized material estimation and mine planning.

Morro Agudo does not currently have any estimated mineral reserves under Industry Guide 7.

Operations and infrastructure

Exploration activities conducted to date have included geological mapping, rock chip, pan concentrate, stream sediment, and soil sampling, airborne and ground geophysical surveys and drilling.

All infrastructure required for the current Morro Agudo mining and processing operations has been constructed and is operational. This includes the underground mine, access roads, power lines, water pipelines, offices and warehouses, process plant/concentrator, conveyor systems, waste rock facilities, temporary mill feed stockpiles and tailings storage facilities. Electric power is supplied by a regional energy supplier in the state of Minas Gerais.

In 2018, we spent US\$13.3 million on this property, primarily associated with the development and maintenance of plant and equipment.

Production

The table below summarizes the Morro Agudo mine's concentrate production, metal contained in concentrates produced and average grades for the periods indicated.

	As of and for the Year Ended December 31,		
	2018	2017	2016
Treatment Ore (in tonnes)	1,060,932	1,054,692	1,018,969
Average Ore Grade			
Zinc (%)	2.70	2.18	2.35
Lead (%)	0.71	0.69	0.92
Concentrate Production			
Zinc concentrates (in tonnes)	65,299	53,004	58,003

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Mining Operations

	As of and for the Year Ended December 31,		
	2018	2017	2016
Lead concentrates (in tonnes)	11,845	11,332	16,014
Metal Contained in Concentrate Production			
Zinc (in tonnes)	26,408	20,969	22,688
Lead (in tonnes)	6,097	5,805	8,135
Silver (in oz.)	55,704	—	—
Cash Cost, After By-Product Credits (in US\$/tonne)	1,363.8	1,644.3	1,336.2
Cash Cost, After By-Product Credits (in US\$/lb.)	0.62	0.75	0.61
Capital Expenditures (in millions of US\$)	13.3	18.6	8.6

Concentrate Sales

All the metal produced by our mines is contained in concentrates. Our mining operations sell the concentrates that they produce to third parties and to our own smelters pursuant to arm's length transactions. Each mine bears the cost of transporting the concentrate to the point of sale where the smelter or trader purchases the concentrate. The smelter or trader pays the mine for the percentage of metals contained in the concentrate, net of charges for treating the concentrate and refining the metals. The typical payable percentage is 85% for zinc contained in concentrate minus treatment charges. Mines that transfer all their zinc concentrates to our own smelters (Vazante, Morro Agudo and Cerro Lindo) receive payment for the recoverable metal plus a premium, and only pay smelter conversion costs.

Growth projects

Brownfield and integration projects

The following table summarizes our brownfield and integration projects.

Project Name	Project Status	Estimated Project Completion / Operating Start Date
Vazante Mine Deepening Project	In execution	2022
Ambrósia Trend	Completed	2017
Bonsucesso	Ongoing pre-feasibility study	2021
Pasco Mining Complex	Third stage completed	2016
Conversion to Jarosite Process	In execution	2019

Vazante mine deepening project

One of our principal brownfield projects is the Vazante Mine Deepening Project, which involves extending the mine life of Vazante mine from 2022 until 2027. The total capital expenditures related to this project are estimated to be US\$177.1 million, with US\$48.0 million representing the total remaining investment necessary to conclude the project. This project began in 2013 and is expected to end in 2022.

In addition, we are conducting exploration activities below the mine's current level of operation and alongside the ore body, which we believe will maintain the Vazante mine's production at 135,000 tonnes of zinc per year until 2029. As part of this project, we expect to invest in ongoing exploration activities and infrastructure, including expansion of an underground pumping station, an increase in the capacity of the ventilation system,

emergency paths, access ramps, electrical networks and substations. During 2018, we concentrated on work related to our EB140 pumping station, including excavation activities, and expect to continue to advance in this venture in early 2019.

Ambróssia Trend

We are working on developing exploration on the deposits and mineral occurrences within the Ambrósia Trend, part of the Morro Agudo project. This program aims to identify mineralization that can be mined in order to ensure the supply of zinc for the Três Marias smelter. Any mill feed material extracted will be sent for processing at the Morro Agudo plant located 55 km to the south.

The Ambrósia Sul project is part of the Ambrósia Trend program. The infrastructure for Ambrósia Sul is located at an industrial facility approximately 2.5 km away from the open pit mine. The facility includes an administrative support area, scales and a mechanical repair shop for mine equipment. The energy required for the operation is obtained through a 2.8 km long transmission line that has a 13.8 kilovolt connection. The line was constructed by the Companhia Energética de Minas Gerais, a partially state-owned company.

The total capital expenditures related to Ambrósia Sul project were R\$59.4 million, or US\$18.3 million, which was primarily spent on administrative support and pre-strip mining of the Ambrósia Sul deposit and included all necessary infrastructure. During 2017, we completed the project. During 2018, we completed a final transmission line interconnection that was authorized by a local energy agency. In 2018, the Ambrósia Sul open pit produced 4.7 thousand tonnes of refined zinc and 367 tonnes of refined lead. In 2019, the Ambrósia Sul open pit is expected to produce 10.2 thousand tonnes of refined zinc and 373 tonnes of refined lead.

Bonsucesso

The Bonsucesso project is a brownfield project that belongs to the Morro Agudo complex (Ambrosia Trend) and will extend the life of mine of the Morro Agudo complex. The project is located 8 km north of the Ambrosia Sul mine and approximately 60 km north of the Morro Agudo mine. The run-of-mine of Bonsucesso will feed the processing plant.

The project is currently in the pre-feasibility study stage. We expect to finalize the study in the second quarter of 2019 and start construction in 2020 after environmental licenses are approved. The total capital expenditures related to this project are estimated to be R\$205.0 million or US\$53.0 million, which includes all project studies (from the scoping study to the feasibility study) and anticipated expenses related to construction and operating infrastructure. We expect to use the existing infrastructure of the Ambrósia open pit mine for the main offices and mine facilities.

In 2018, our expenditures for this project were R\$12.1 million or US\$3.2 million, which primarily related to the scoping study and pre-feasibility study. In 2019, we expect to spend an additional R\$29.3 million or US\$7.6 million, mainly relating to the pre-feasibility and feasibility studies and conclusion of the viability stage.

Pasco mining complex

The Pasco mining complex project involves the integration of the El Porvenir and Atacocha mines. The project is intended to capture synergies between the two mining operations resulting from their proximity and operational similarities, with the goal of obtaining costs and investment savings and reducing our environmental footprint.

The integration project is being developed through four stages. The first stage involved the administrative integration of both mines, which was completed in 2014 and involved US\$41.7 million in expenditures. The second stage involved the integration of the tailing disposal system, which consolidated the operations of the two mines with a single tailing disposal system and thereby helped reduce the environmental footprint. This stage was completed in 2015 and the integrated tailing disposal system commenced operations in the beginning of 2016, with expenditures of US\$22.0 million. The third stage, which was completed in 2016, involved the construction of a new energy transmission line with a 138 kilovolt connection that supplies both mines, replacing the prior 50 kilovolt transmission lines. We spent US\$5.1 million during this third stage. Our management committee is evaluating the implementation strategies of this project, after which we expect to proceed to the final stage, which includes the integration of the underground operations and underground facilities at the two mines.

Conversion to Jarosite process

We intend to convert our Cajamarquilla smelter to the Jarosite process, which will allow for the recovery of a greater percentage of zinc. The conversion to Jarosite process is also attractive due to the positive market outlook for zinc. Wood plc (formerly Amec Foster Wheeler) has completed feasibility studies on the project, and we have decided to move forward with the construction phase of the project. In addition, an independent consultant performed crosschecks of the process route. The project is estimated to improve the zinc recovery rate by 3.0% points at the Cajamarquilla smelter. The total capital expenditure for the conversion is estimated to be US\$44.9 million, and we expect to complete the project by the third quarter of 2019. During 2018, the project's execution phase progressed 47.0%, primarily driven by engineering and procurement activities. Other important highlights include: (i) SNC Lavalin's conclusion of the detailed engineering development plan; (ii) the beginning of work by the construction contractor on thickeners and tanks; and (iii) the conclusion of the mobilization process by the electromechanical contractor.

Greenfield projects

Project Name	Current Project Status	Estimated Start Date ⁽¹⁾
Aripuanã	In execution	2021
Shalipayco	Ongoing pre-feasibility study	2022
Magistral	Ongoing pre-feasibility study	2023
Hilarión	Exploration phase	N/A
Pukaqaqa	Ongoing pre-feasibility study	2023
Florida Canyon Zinc	Exploration phase	N/A
Caçapava do Sul	Exploration phase	2024

(1) The estimated start date for the projects listed is subject to a number of factors, including the completion of feasibility studies, market conditions and approval by our management committee.

We summarize below certain information, including the outlook, for each of our greenfield projects. As of the date of this report, none of our greenfield projects have known reserves under Industry Guide 7.

Aripuanã

Aripuanã is an underground polymetallic project containing zinc, lead and copper, located in the state of Mato Grosso. The Aripuanã project is owned by Mineração Dardanelos Ltda., a joint venture between Nexa Brazil (which holds a 62.3% interest), Nexa Peru (which holds a 7.7% interest) and Mineração Rio Aripuanã Ltda., a subsidiary of Karmin Exploration Inc. (which holds the remaining 30.0%). We are currently fully funding the development of the project, as Mineração Rio Aripuanã Ltda. is not required to contribute financially to the project until October 19, 2019, one year after the completion of the feasibility study.

The Aripuanã zinc polymetallic deposits are Volcanogenic Massive Sulphide, or VMS, deposits. The project's zinc processing plan was developed by taking into account conventional technologies for treatment, including the sequential flotation for the recovery of zinc, copper and lead as separate concentrates. In 2018, after the conclusion of the feasibility study and detailed analysis by our management, our board of directors approved the beginning of construction of the Aripuanã project. We also published an NI 43-101 technical report that summarizes the results of the feasibility study. We received an installation license at the end of 2018, which allows construction to proceed. We estimate that we will invest 35.0% and 49.0% of the total estimated capital expenditures for the Aripuanã project in 2019 and 2020, respectively, with residual investments anticipated during the start of production in 2021. In 2018, we spent approximately US\$18.8 million on the Aripuanã project—US\$16.7 million on pre-feasibility studies and a further US\$2.1 million on feasibility studies.

Our board of directors has approved the construction of the Aripuanã project. During the fourth quarter of 2018 and early 2019, we concluded the procurement process for certain items, including transmission lines, thickeners, flotation cells and columns, press filters and key equipment for crushing and grinding processes. We have also engaged an engineering, procurement and construction management contractor (SNC Lavalin) and a civil and electromechanical contractor. We have started early construction work, mainly consisting of measures aimed towards the construction of ramp tunnels, which will enable us to advance our exploration activities and to develop operations at the mine. The site also includes some temporary facilities in order to coordinate the early construction work.

In 2019, we estimate that we will invest US\$140.0 million in Aripuanã, which represents 35.0% of the US\$392.0 million in total estimated capital expenditures for the project. We expect to invest 49.0% of the US\$392.0 million in 2020, with residual investments to be made during the start of production in 2021.

Shalipayco

The Shalipayco project is a joint venture between Nexa Peru (which holds a 75.0% interest) and Pan American Silver Perú S.A.C. (which holds the remaining 25.0%) located in the Central Andes of Peru. It is a potential underground polymetallic project containing zinc, lead and silver deposits. This project consists of mining concessions with evidence of MVT mineralization, which is a deposit type similar to our Morro Agudo mine. The Shalipayco mineralization is mainly located within the Chambará formation that is part of the Pucará Group, considered the most important Peruvian location for MVT mineralization.

In 2018, we spent approximately US\$7.0 million on this project, primarily relating to 36,134 meters of diamond drilling focused on resources expansion, geological mapping, surface targets follow-up, hydrogeological and mineralogical studies, project maintenance and permits.

During 2018, a scoping study was developed by Wood plc (formerly Amec Foster Wheeler), and we received approval from our management committee to move forward with a pre-feasibility study. As a result of the scoping study, and to maximize the project's economics, we included in the project plan additional infill drilling to reclassify the project's mineral resources, as well as the construction of a beneficiation plant at Shalipayco.

During 2019, we expect to start a hydrological campaign based on an environmental impact assessment, or EIA, in order to advance the development of the pre-feasibility study. We also anticipate performing further studies to improve the hydrogeological assessment and evaluating alternatives to process the ore in Shalipayco. We also expect to move forward with metallurgical testworks already in progress.

Magistral

The Magistral mining project is located in the Ancash department in Peru and is intended to be an open pit copper mine. In 2016, ProInversión approved a feasibility study, which set forth production rates starting at 10.0 ktpd. Also in 2016, the MINEM approved an EIA, which allows us to expand our treatment capacity to up to 30.0 ktpd. In December 2016, we entered into an agreement with Activos Mineros S.A.C. and ProInversión for the transfer of mining concessions corresponding to the Magistral project from Activos Mineros to Nexa Peru.

During 2017, Ausenco, an Australian firm, developed a scoping study based on our investment policies and identified opportunities to improve the project's internal rate of return and net present value. During 2018, we started the pre-feasibility study with Ausenco and completed a drilling campaign and metallurgical testwork. In order to improve project revenue, we spent approximately US\$7.0 million during 2018 to analyze further options and optimize plant size. Ausenco also analyzed several pre-feasibility study options, including the assessment of the potential for a future underground mine and a tailings dam solution. The tailings dam solution was approved by our management committee in 2018. The Peruvian government also issued permits for pre-feasibility study-level drilling.

We expect the pre-feasibility study for the project to conclude in the second quarter of 2019 and will present the study to our management committee for approval. The project is expected to start in the fourth quarter of 2023, subject to various factors, including impacts relating to improvements on plant infrastructure, a new tailings

dam solution and the approval of required permits. The anticipated budget for the pre-feasibility phase is US\$12.0 million.

Hilarión

The Hilarión exploration project is located 50 km south of the Antamina mine in the Ancash department in Peru and 230 km from Lima. It is a skarn mineral deposit made of vertical tabular ore bodies containing sulfide zinc, lead, silver and copper deposits. The project concept is the development of an underground mine that could either use its own processing plant or use one of the several existing plants in the area, such as Pachapaqui, Huanzala and Atalaya plants.

In 2018, we spent approximately US\$5.5 million on the Hilarión project, including project maintenance and permits. As of December 31, 2018, we have drilled eight drill holes totaling 6,789 meters at Hilarión. We have budgeted US\$5.7 million for drilling at the Hilarión project during 2019.

Pukaqqa

The Pukaqqa project contemplates the development of an open pit copper and molybdenum mine, with gold credits. The mineralization is hosted by an epithermal breccia system that is associated with exo- and endoskarn alterations. Given the geological setting, we believe that a porphyry copper system remains undiscovered below the currently explored mineralization, which will be explored in the following phases.

In 2015, the MINEM approved Pukaqqa's environmental impact assessment, which allowed for treatment capacity of up to 30.0 ktpd. In 2017, a scoping study was developed by JRI, a Chilean engineering firm. The study was developed in compliance with our investment policies and approved by our management committee.

In 2018, we spent approximately US\$6.5 million on this project, primarily in connection with drilling works and a pre-feasibility study. During 2018, we started a pre-feasibility study, concluded our drilling campaign and finalized the design of the tailings storage facility. We prioritized drilling boreholes for metallurgy testwork, and samples were characterized, selected and sent to metallurgical testwork. JRI began studies in order to provide a basis to select the best alternative for the project. Finally, the Peruvian government recently issued permits for pre-feasibility study-level drilling.

During 2019, we expect to finalize and submit the pre-feasibility study to our management committee for approval, in accordance with our investment policies. The expected budget for the pre-feasibility study is US\$9.4 million.

Florida Canyon Zinc

The Florida Canyon Zinc project is owned and operated by Minera Bongará S.A., a joint venture between Nexa Peru, Solitario Exploration and Royalty Corp. and Minera Solitario Peru S.A.C. (collectively, Solitario) in existence since 2006. As of December 31, 2018, Nexa Peru owns a 61.0% interest in this joint venture, which may increase up to 70.0% upon Nexa Peru's satisfaction of certain funding conditions. Florida Canyon Zinc is an advanced mineral exploration project comprised of 16 contiguous mining concessions, covering approximately 12,600 hectares.

In 2018, we spent approximately US\$1.3 million on this project. A large drilling operation took place in 2012, when we invested US\$4.5 million in order to improve the project's ore classification. During 2018, Florida Canyon Zinc completed 2,203 meters of drilling in five diamond drill holes. In January 2017, Solitario engaged SRK Consulting to complete a preliminary economic assessment on Florida Canyon Zinc, which was completed in the second quarter of 2017. Since late 2017, we have been working to complete exploration and project activities in line with our investment policies to begin an updated scoping study.

As of December 31, 2018, we are in the process of developing the engineering of the access roads for drilling purposes, which we expect to reduce logistics costs. In the second quarter of 2019, we expect to start the construction of 10 km of access roads, out of a total of 41 km to be constructed.

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Mining Operations

Caçapava do Sul

The Caçapava do Sul project is a joint venture between Mineração Santa Maria Ltda., a wholly-owned subsidiary of Nexa Brazil, which holds a 56% interest, and IAMGOLD Corporation, which holds a 44% interest. Nexa Brazil is the operator of the joint venture. The Caçapava do Sul project is a polymetallic project that has the potential to be mined by open pit and underground methods.

In 2018, we spent approximately US\$2.97 million on the Caçapava do Sul project, drilling 6,757 meters in 14 holes. During 2019, we expect to spend US\$4.7 million, drilling 13,000 meters.

Permits & authorizations for greenfield projects

The following table summarizes the status of the main permits and authorizations for our greenfield projects.

Project	Status
Aripuanã	An environmental impact assessment was submitted to SEMA/MT in 2017. On April 25, 2018, SEMA/MT granted the preliminary environmental license for the Aripuanã project after the approval by the Environmental State Council. The license certifies that the project complies with the environmental requirements of projects with similar characteristics. On December 20, 2018, SEMA/MT granted the installation license for the Aripuanã project, which allows us to begin construction.
Shalipayco	The most recent exploration authorization was approved in 2016, and expired in March 2018. A new environmental impact assessment for exploration was submitted for approval by a local environmental agency in November 2017 and was granted in early 2019. We expect to focus on other studies that do not require environmental impact assessments in the interim, including hydrogeological, metallurgical, geological modeling and conceptual engineering studies.
Magistral	The most recent exploration authorization was approved in February 2017 and expired on December 1, 2017. An environmental impact assessment was approved in 2016 and grants additional exploration rights to us. The environmental impact assessment is valid until 2019 and is subject to renewal for an additional two years.
Hilarión	The most recent exploration authorization was approved in 2014 and is valid until 2022. In 2017, a new environmental impact assessment was granted for the El Padrino deposit.
Pukaqqa	The most recent exploration authorization was approved in 2015 and is valid until 2020.
Florida Canyon Zinc	The most recent exploration authorization was approved in 2016 and expired in 2017. During 2018, we obtained a new exploration permit to resume exploration activities, which is valid until 2022.
Caçapava do Sul	The most recent exploration authorization was approved in 2014. During 2018, we received a special exploration authorization, which is valid until 2021. An environmental impact assessment was submitted in 2016 to the Fundação Estadual de Proteção Ambiental Henrique Luiz Roessler and we expect to receive approval in 2021.

Tailings disposal

We use four disposal options for tailings. Our preferred option is to convert part or all of the tailings material into a commercially viable product. We use this method at our Morro Agudo mine, where most of the tailings that we produce are ZinCal, a limestone rich in zinc that is used as fertilizer. This option does not require disposal of tailings materials.

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Mining Operations

When the conversion method is not available, we prefer to use the backfill method for our underground mines. This technique involves removing moisture from tailings, creating a mixture with cement and filling open spaces in the mines with this combination. We believe this method reduces safety risks related to tailings disposal.

If neither the conversion nor the backfill method is available, we prefer to use the dry stacking method, which involves removing moisture from tailings and stacking them in layers to form an artificial mountain covered with soil and vegetation, causing it to integrate into the local landscape. We use the dry stacking and backfill methods at our Cerro Lindo mine in Peru. We expect to implement the dry stacking method at our Vazante mine and expect to use the backfill and dry stacking methods at our Aripuanã greenfield project once it becomes operational.

When these three methods are not possible, we use tailings dams, which are open spaces built between two walls, which forms a reservoir where the tailings are stored. The dam acts as a solid barrier engineered to prevent the tailings material from escaping to the environment around the mine. We use this method in Peru at our El Porvenir and Atacocha mines and at our Cajamarquilla smelter, and in Brazil at our Vazante and Morro Agudo mines and Juiz de Fora and Três Marias smelters. We also use a combination of the backfill method and tailings dams at our El Porvenir and Atacocha mines in Peru.

We raise our tailings dams using the following methods: (i) the downstream method, where the building material is disposed downstream of the crest of the dam body; (ii) the center-line method, where the building material is disposed partially downstream and partially upstream of the crest of the dam body, while maintaining the same center-line of the crest; and (iii) the upstream method, where the building material is disposed upstream of the crest of the dam body.

We also use effluent dams, which are dams used to treat water that contains tailings particles or other solid particles. The effluent dams separate the tailings particles or other solid particles from the water by retaining the particles and releasing the clean water downstream. Finally, we use products dams for the provisional storage of ZinCal prior to its sale.

We currently have 46 disposal facilities (including tailings dams, dry stacking facilities, effluent dams and products dams), 22 of which are operational. Of our eight operational tailings dams, seven were raised using either the downstream method or the center-line method, and one dam was at one point raised using the upstream method but was later raised using the downstream and the center-line methods. Of our 24 non-operational tailings dams, 16 are in the process of being decommissioned, and we have plans to decommission the others. Two of our non-operational dams were raised using the upstream method.

All of our dams and dry stacking structures are subject to a monitoring system known as SIGBAR/SIGDEP (*Sistema de Gestão de Barragens ou Depósitos*), which consists of procedures, tools and sensors designed to promote the safety of these structures. The monitoring procedures include regular inspections, as well as internal and external audits.

The following is an overview of the dams we have in place at our principal mining and smelting facilities:

Peru

- At Cerro Lindo, we have no tailings dams, and tailings are disposed of using a combination of the backfill method, two dry stacking structures and two effluent dams.
- At El Porvenir and Atacocha, tailings are disposed of using a combination of the backfill method and tailings dams; there are two tailings dams in active use and four non-operational tailings dams, which are in the process of being decommissioned.
- At Cajamarquilla, there are three tailings dams in active use and four non-operational tailings dams, which are in the process of being decommissioned.
- At the Chapi mine property, which is currently inactive, there are five non-operational tailings dams.
- At the Sinaycocha property, which is part of our Atacocha mine property, there are two non-

operational tailings dams.

Brazil

- At Morro Agudo, most tailings are converted for sale, and the product is stored temporarily at two products dams until it is sold. A separate tailings dam is used to store tailings that are not convertible into product.
- At our Ambrósia mine, there is one effluent dam in active use.
- At Vazante, tailings are disposed of using a combination of tailings dams and dry stacking; there is one tailings dam in active use, one effluent dam in active use and one dry stacking facility under construction.
- At Juiz de Fora, there is one tailings dam in active use, three effluent dams in active use and six non-operational tailings dams, five of which are in the process of being decommissioned.
- At Três Marias, there are three tailings dams in active use and three non-operational tailings dams, which are in the process of being decommissioned.

For more information, see “Risk factors—Operational risks—The failure of a tailings dam could negatively impact our business, reputation and results of operations” and “Information on the Company—Regulatory matters—Brazilian regulatory framework—Regulation of dams.”

SMELTING OPERATIONS

The table below provides an overview of our smelting facilities:

Smelting Unit	Location	Smelting Process	Principal Refined Zinc Products	Plant Capacity (in tonnes of refined metal per year)	Metallic Zinc Production in 2018 (in tonnes of zinc content)	Zinc Oxide Production in 2018 (in tonnes of zinc content)	Other Products
Cajamarquilla	Peru	RLE	Metallic zinc (SHG, CGG jumbos and alloys)	338,152	330,104	—	Sulfuric acid, silver concentrate, copper cement and cadmium sticks
Três Marias	Brazil	RLE	Metallic zinc (SHG, CGG jumbos, alloys and Zamac) and zinc oxide	190,000	186,711 ⁽¹⁾	30,813	Cadmium briquettes
Juiz de Fora	Brazil	Waelz Furnace and RLE	Metallic zinc (SHG, alloys and Zamac)	94,105	90,583 ⁽²⁾	—	Sulfuric acid, sulfur dioxide, silver concentrate, copper sulfate and zinc ash
Total				622,257	607,398	30,813	

(1) Including 28,639 tonnes of zinc ashes and drosses, as well as metallic zinc used in the production of zinc oxide, zinc granules and zinc powder. Does not include zinc cathode from Juiz de Fora.

(2) Including 2,236 tonnes of zinc ashes and drosses and 10,168 tonnes of zinc cathodes transferred to Três Marias.

Notes: RLE means roast-leach-electrowin.

Alloys are zinc-based products with the addition of up to 1.0% of a specified metal, which are primarily used in the galvanizing market.

Special alloys are zinc-based products with addition of specified metals, which are primarily used in galvanizing market.
Zamac is a zinc-based product with the addition of specified metals, which are primarily used in the die casting market.

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Smelting Operations

Zinc contained in smelting products sold

The tables below provide key information for the periods indicated regarding refined zinc products, such as the typical grade of zinc in each line of products, total volumes sold and zinc contained in each line of product sold.

Metallic zinc

Product	Content	Standard Zinc Content	Product Volume Sold for the Year Ended December 31,			Zinc Contained in Product Volume Sold for the Year Ended December 31,		
			2018	2017 (in tonnes)	2016	2018	2017 (in tonnes)	2016
SHG	Zinc	99.995%	349,911	336,065	343,761	349,423	336,049	343,744
CGG Jumbos	Zinc							
	Zinc, other	99.5%	168,681	160,151	169,197	167,838	159,350	168,351
Alloys	metals							
	Zinc, Aluminum, Magnesium,	99.3%	49,649	49,475	49,699	49,302	49,129	49,351
Zamac	Copper	94.5%	10,958	9,727	10,448	10,356	9,192	9,873
Total			578,730	555,419	573,105	576,918	553,720	571,319

Zinc oxide

Product	Content	Standard Zinc Content	Product Volume Sold for the Year Ended December 31,			Zinc Contained in Product Volume Sold for the Year Ended December 31,		
			2018	2017 (in tonnes)	2016	2018	2017 (in tonnes)	2016
Zinc oxide	Zinc, Oxygen	80.0%	38,152	38,472	37,386	30,522	30,777	29,909

Cajamarquilla

The Cajamarquilla smelter is located in the district of Lurigancho/Chosica in Lima, Peru, and is accessible by road.

The Cajamarquilla smelter is currently the largest zinc smelter in Latin America and the only zinc smelter in Latin America outside Mexico and Brazil, according to Wood Mackenzie. It uses the RLE process to produce metallic zinc. With an annual production capacity of 338,152 tonnes, the Cajamarquilla smelter produced 330,104 tonnes in 2018. In recent years, Cajamarquilla developed operational efficiencies, including debottlenecking projects, which increased the production of calcine from concentrates obtained from Nexa Peru, and the use of calcine processed by third parties. See “Risk factors—Operational risks—Inadequate supply of zinc secondary feed materials and zinc calcine could affect the results of our smelters.”

The Cajamarquilla smelter produces zinc primarily from zinc concentrates and, to a lesser extent, recycled zinc secondary feeds (also referred to as pre-treated concentrate). In 2018, the Cajamarquilla smelter consumed approximately 347.7 thousand tonnes of zinc contained in concentrates. In 2018, 38.1% of the zinc contained in concentrates used by the Cajamarquilla smelter was sourced from our mines in Peru and 61.9% was purchased from third parties.

In 2018, the Cajamarquilla smelter sold approximately 332.6 thousand tonnes of metallic zinc, of which 35.4% of the volume was sold to Latin America (including Mexico), 25.4% to Europe, 13.5% to the United States

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Smelting Operations

and Canada, 6.4% to international traders, 16.2% to Asia and 3.1% to Africa. The Cajamarquilla smelter also produces sulfuric acid, silver concentrate, copper cement and cadmium sticks. These products are sold primarily to international traders and local customers.

The following table presents the historical concentrates processed and zinc recovery rate in Cajamarquilla for the periods indicated.

	For the Year Ended December 31,		
	2018	2017	2016
Input (in tonnes)			
Zinc Contained in Concentrate from Our Mines	132,546	139,967	133,179
Zinc Contained in Concentrate from Third Parties	215,132	188,318	212,658
Secondary Raw Material	—	654	—
Total Inputs	347,678	328,939	345,837
Zinc Recovery (%)	93.6	95.5	93.8

Três Marias

The Três Marias smelter is located in the municipality of Três Marias in the state of Minas Gerais, Brazil, 250 km from the Morro Agudo mine and 253 km from the Vazante mine and is accessible by road.

The Três Marias smelter was built to treat the zinc silicate concentrates from the Vazante mine (willemite and calamine) and sulfide concentrates from the Morro Agudo mine, from Nexa Peru and from third-party concentrates. Currently, this smelter is integrated with the operations of the Vazante and Morro Agudo mines, and it uses the RLE process to produce metallic zinc and zinc oxide. The annual production capacity of our Três Marias smelter is 190,000 tonnes per year. Production in 2018 totaled 186,711 tonnes of zinc.

The Três Marias smelter produces zinc primarily from zinc contained in concentrates and, to a lesser extent, recycled zinc secondary feeds. In 2018, this smelter consumed approximately 202.5 thousand tonnes of zinc contained in concentrates and 0.9 thousand tonnes of secondary raw material.

In 2018, Três Marias sold approximately 167.4 thousand tonnes of metallic zinc and 38.2 thousand tonnes of zinc oxide, of which 72.9% of the volume was sold to Latin America (including Mexico), 12.7% to international traders, 7.1% to Africa, 6.9% to Asia, 0.4% to Europe and 0.1% to the USA. The Três Marias smelter also produces copper/cobalt cement and cadmium briquettes. These products are sold to local customers.

The Três Marias smelter contains a zinc oxide production plant intended for the chemical, pneumatic, ceramic, animal feed and fertilizer industries. In 2018, the production of zinc oxide was approximately 38.5 thousand tonnes, corresponding to 30.8 thousand tonnes of zinc content. In zinc content, approximately 76.9% of the raw material was electrolytic zinc that originated from the melting stage. In addition, we purchased 23.1% of raw material from third parties, in the form of dross and skims, to produce zinc oxide as well as the generation of by-products.

The following table presents the historical concentrates processed and zinc recovery rate in Três Marias for the periods indicated.

	For the Year Ended December 31,		
	2018	2017	2016
Inputs (in tonnes)⁽¹⁾			
Zinc Contained in Concentrate from Our Mines	185,970	181,334	193,516
Zinc Contained in Concentrate from Third Parties	16,483	14,442	5,790
Secondary Raw Material	933	717	1,231
Total Inputs	203,387	196,493	200,536
Zinc Recovery (%)	93.7	94.7	94.8

(1) Impacted by higher secondary raw material consumption and concentrates with contaminants (mainly iron and arsenic).

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Smelting Operations

Juiz de Fora

The Juiz de Fora smelter is located in the municipality of Juiz de Fora in the state of Minas Gerais, Brazil, and is accessible by road.

The Juiz de Fora smelter produces zinc from sulfide concentrates and secondary sources such as EAF dust, batteries, and brass oxide, and uses the RLE process to produce metallic zinc. The annual production capacity of our Juiz de Fora smelter is 94,105 tonnes per year. In 2018, Juiz de Fora produced 90,583 tonnes of metallic zinc. In recent years, Juiz de Fora used calcine processed by third parties in its production process.

The Juiz de Fora smelter produces zinc from zinc concentrates and recycled zinc secondary feeds. In 2018, this smelter consumed 77.5 thousand tonnes of zinc contained in concentrates and 19.2 thousand tonnes of zinc from secondary raw material and secondary sources.

In 2018, the Juiz de Fora smelter sold approximately 78.7 thousand tonnes of metallic zinc, of which 99.6% of the volume was sold to Latin America (including Mexico), 0.1% to Asia and 0.3% to Africa. This smelter also produces sulfuric acid, sulfur dioxide, silver concentrate and copper sulfate.

The following table presents the historical concentrates processed and zinc recovery rate in Juiz de Fora for the periods indicated.

	For the Year Ended December 31,		
	2018	2017	2016
Inputs (in tonnes)			
Zinc Contained in Concentrate from Our Mines	45,537	43,257	57,731
Zinc Contained in Concentrate from Third Parties	32,004	32,228	17,030
Secondary Raw Material	19,165	19,096	16,773
Total Inputs	96,706	94,581	91,534
Zinc Recovery (%)	93.3	90.7	92.7

OTHER OPERATIONS

Transportation and shipping

Concentrates in our mines

Our Cerro Lindo operation transports 100.0% of its concentrates by road. The concentrates are trucked in a dedicated fleet through the Panamericana Sur road to the port of Callao that is approximately 255 km north, or to the Cajamarquilla smelter. This transportation is covered by long-term contracts entered with two trucking companies, Transaltisa S.A. and Servicios Generales Saturno S.A.C.

Our Atacocha and El Porvenir operations use both road and rail transportation. The concentrates are trucked through the Carretera Central road to the port of Callao that is approximately 315 km west, or to the Cajamarquilla smelter. We also use railway transportation to secure logistic availability and maintain high environmental standards. Our use of railway transportation is covered by a long-term contract entered with Ferrocarril Central Andino S.A., or FCCA, an exclusive concessionary of the Peruvian government for the central line rail system.

The zinc concentrate produced in the Cerro Lindo, Atacocha and El Porvenir mines supply both our Peruvian and Brazilian smelters, as well as third-party customers, while the lead and copper concentrates produced by these mines are transported to third-party customers from the port of Callao. Our smelters use zinc concentrate supplied from our mines and from third-party suppliers to meet the blending needs of each smelter.

The Peruvian zinc concentrate supplied to the Brazilian smelters is loaded in bulk 25,000 tonne shipments and sent to the Port of Rio de Janeiro, where it is cleared through customs and then loaded into railcars to the Juiz de Fora smelter or into trucks and railcars to the Três Marias smelter. The ocean freight for this Peruvian zinc is covered by a long-term freight contract with Daiichi Chuo Kisen Kaisha.

All the zinc concentrates produced at our Vazante and Morro Agudo mines are transported by road to the Três Marias smelter using two trucking companies. These mines also produce lead and lead/silver concentrates, which are loaded into containers at the mine and are transported using trucks and trains to the Sepetiba Tecon Port, in Itaguaí, Rio de Janeiro. The lead and lead/silver concentrates are then shipped to customers in Asia in accordance with our annual contracts with container shipping lines.

Smelters

The metallic zinc produced in the Cajamarquilla smelter is transported by train to a terminal near the port of Callao. The material intended for the Peruvian domestic market is distributed by truck from this terminal, while exports to foreign markets are loaded into containers and transported by truck from this terminal to the port of Callao.

The metallic zinc produced in the Juiz de Fora and Três Marias smelters is transported by truck for either local customers or exports. In the case of exports, the material is transported to terminals near the ports of Rio de Janeiro or Sepetiba, both in the state of Rio de Janeiro, or the port of Santos, in the state of São Paulo. The material is then loaded into containers at the terminal and transported to the ports by truck, where it is shipped to customers abroad.

The metallic zinc and zinc oxide production process in our smelters also produces by-products. The most relevant by-products are sulfuric acid and silver concentrate. Sulfuric acid produced in the Cajamarquilla smelter is loaded into dedicated FCCA tank railcars and transported to Depositos Químicos Mineros S.A., or DQM, where it is stored. The sulfuric acid is then loaded in bulk into chemical ship-tanks destined to our customers and discharged at the Chilean ports of Mejillones, Barquito and Michilla. The silver concentrate produced in the Cajamarquilla and Juiz de Fora smelters is loaded into containers and are dispatched to the port of Callao in Peru or to the port of Sepetiba in Brazil.

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Other Operations

We ship all our refined zinc and silver concentrate exports in containers. Transportation of this material is covered by annual agreements with the liner shipping providers, including Hamburg Süd, Mediterranean Shipping Company and Hapag Lloyd, which are responsible for 75.0% of these shipments.

Since 2009, we have participated in joint bidding arrangements with other companies that are or were part of the Votorantim Group (such as Fibria Celulose S.A., Citrosuco S.A. Agroindústria and CBA) to obtain competitive rates on container ocean freight rates. We aggregate our anticipated shipping volumes with those of the aforementioned companies and jointly negotiate the terms of the ocean freight rate with container shipping companies based on this aggregate volume, thereby benefiting from economies of scale. In 2016, we jointly negotiated ocean freight rates covering more than 30,000 containers for the aforementioned companies.

Sales and marketing

We sell most of our products through supply contracts with terms between one and four years. Only a small portion of our products is sold on the spot market. The agreements with our customers include customary international commercial terms, such as CIF, FOB and other delivery terms based on Incoterms 2010. Our ability to deliver significant volumes across several regions worldwide makes us a significant supplier to a client base of end-users and global traders. As a result, we can obtain competitive commercial terms for our products in the long-term. In 2018, our top 10 metallic zinc customers represented approximately 51.4% of the total sales volume for such products, with our top 10 zinc oxide customers representing 69.7% of the total sales volume for that product, and our top three concentrate customers represented approximately 80.8% of the total sales volume for such products, in each case excluding intercompany sales.

Concentrates

In 2018, the majority (approximately 98%) of our total production volume of zinc concentrates went to our smelting operations in Peru and Brazil. In 2018, we sold 8,296 tonnes of zinc contained in concentrates produced from our Peruvian operations to third-party customers. Sales prices are established mainly by reference to prices quoted on the LME less a discount based on either the treatment charge or smelter charge. The LME price quotes are based on prevailing LME average prices for the period set forth in our sale agreements, and generally refer to either the month following the shipment or the period near the execution date of the relevant agreement.

We also purchase zinc contained in concentrate from third-party suppliers to meet our raw material requirements. In 2018, 58% of the total zinc contained in concentrate consumption in our smelters was produced by our mines and 42% was purchased from third parties.

Refined metals

Our metallic zinc and zinc oxide are sold worldwide through our commercial offices located in:

- São Paulo, Brazil;
- Lima, Peru;
- Houston, United States; and
- Luxembourg, Grand Duchy of Luxembourg.

We hold a leadership position in our home market, Latin America (including Mexico), with a market share of 84.9% in 2018, according to our sales volume, import databases and demand forecasts sourced from specialized consultancy groups and customs websites. In other regions, we hold a strategic position, with market share of 17.8% in Africa, 2.5% in North America, 3.5% in Europe and 0.7% in Asia, according to our sales volumes, import databases and demand forecasts sourced from specialized consultancy groups and customs websites. In recent years, we have increased our sales of metallic zinc and zinc oxide to end-users in attractive markets, consolidating a commercial network in place to support volume growth.

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Other Operations

In 2018, 79.1% of our total sales of refined metals were to customers in the continuous galvanizing, general galvanizing, die casting, transformers and alloy segments and 20.1% of our total sales were to international traders. Our products are sold to end-users in the transport, construction, infrastructure, consumer goods and industrial machinery industries. Of our volume of metallic zinc and zinc oxide sales in 2018, 56.1% were to Latin America (including Mexico), 13.8% to Europe, 7.3% to the United States and Canada, 4.1% to Africa and 11.0% to Asia, with the remaining 8.0% to international traders. Sales prices are mainly established by reference to prices quoted on the LME plus a negotiable premium. Pricing is based on prevailing LME average prices for a period set forth in our sale agreements, which generally refer to the month prior to shipment.

By-products

We sell a wide variety of chemical and metallurgic by-products generated during the production processes in our smelters and mines to a broad customer base. Our sales include more than 30 different by-products, most of which are sold locally based on the characteristics of each market or region.

Power and energy supply

Peru

With respect to our Peruvian operating units, we obtain 97% (1,847.07 GWh) of the electricity for our operations from the SEIN and 3.2% (60.76 GWh) from our own hydroelectric power plants. We own three hydroelectric power plants, two at Atacocha and one at El Porvenir, with a total installed gross rated capacity of 10,568 kilowatts, or KW. We also receive our energy from third parties through electricity supply contracts. Our Cerro Lindo, El Porvenir and Atacocha units have electricity supply contracts with Engie Energía Perú S.A., which cover 100.0% (278.85 GWh), 84.41% (117.01 GWh) and 50.0% (38.74 GWh) of their electricity requirements, respectively. The Cajamarquilla unit entered into a long-term electricity supply contract with Engie Energía Perú S.A. (formerly Enersur S.A.) on March 2017 and has a supply contract with Enel Generación Perú S.A.A. (formerly Edegel S.A.A.). Both contracts expire in December 2019 and cover approximately two-thirds and one-third, respectively, of Cajamarquilla's total electricity demand.

The following table sets forth the energy sources and electricity consumption with respect to our Peruvian operating units in 2018.

Operating Unit	Energy Source	Total Energy Consumed in 2018 (GWh)	Percentage of Total Energy Usage in 2018
Third Party			
Cerro Lindo	Third Party (Engie Energía Perú S.A.)	278.85	14.6%
El Porvenir	Third Party (Engie Energía Perú S.A.)	117.01	6.1%
Atacocha	Third Party (Engie Energía Perú S.A.)	38.74	2.0%
Cajamarquilla	Third Party (Engie Energía Perú S.A.)	1,005.63	52.7%
Cajamarquilla	Third Party (Enel Generación Perú S.A.)	406.84	21.3%
Total Energy Usage		1,847.07	96.8%
Own Power Plant			
El Porvenir	Own Power Plant (Candelaria)	22.06	1.2%
Atacocha	Own Power Plant (Chaprin and Marcopampa)	38.70	2.0%
Total Energy Usage		60.76	3.2%

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Other Operations

Hydroelectric plants

Candelaria

The El Porvenir unit has one hydroelectric plant, the Candelaria Hydroelectric Power Plant, which is located along the Lloclla River. The plant contains three separate hydroelectric turbines, two of which have been operational since 1957 and the third since 1998, and which together have an installed rated capacity of 4.2 MW. During 2018, El Porvenir consumed 22.06 GWh, which represented approximately 1.2% of the energy usage of the unit.

Chaprin and Marcopampa

The Atacocha unit has two hydroelectric plants. The Chaprin Hydroelectric Power Plant is located along the Lagia Ravine near the Huallaga river. The plant has been operating since 1953 and its installed rated capacity is 5.4 MW. The Marcopampa Hydroelectric Power Plant has been operating since 1937, and was overhauled in 1984, increasing its installed rated capacity of 1.0 MW. During 2018, Atacocha consumed 38.7 GWh from these plants, which represented approximately 2.0% of the energy usage of the mine.

Brazil

With respect to our Brazilian operations, as of December 31, 2018, the power and energy supply comes from five hydroelectric plants in which our subsidiary Polarix S.A., or Polarix, has directly or indirectly the following interests: a 21.0% equity participation in the consortium Enercan (Campos Novos hydroelectric power plant), 100.0% ownership of the hydroelectric power plant Picada located in Minas Gerais, a 12.6% equity participation in the consortium Amador Aguiar I, a 12.6% equity participation in the consortium Amador Aguiar II and a 23.9% equity participation in the consortium Igarapava. These consortiums have hydroelectric power plants in the states of Minas Gerais and Santa Catarina. Igaparava provides electricity exclusively to Vazante and Três Marias, while the other four sources (Picada, Amador Aguiar I and II and Campos Novos) provide electricity to the four operating units (Vazante, Morro Agudo, Três Marias and Juiz de Fora). As of December 31, 2018, we expect these sources to provide 100.0% of the expected energy consumption of our Brazilian operations over the medium term.

The only activity of Polarix is to own our energy assets, selling energy to our Brazilian operating subsidiaries at market prices. We own all the common shares of Polarix, which represents 33.33% of its total share capital. The remaining shares are preferred shares with limited voting rights, which are owned by our shareholder VSA and/or its affiliates. Under the terms of the preferred shares, VSA is entitled to dividends per share equal to 1.25 times the dividends per share payable on the common shares. See “Operating and financial review and prospects—Overview—Key factors affecting our business and results of operations—Operating costs and expenses—Energy costs.”

The following table sets forth our energy sources and consumption with respect to our Brazilian operations in 2018.

Operating Unit	Energy Source	Power Plant	Percentage of Polarix Ownership	Total Energy Consumed in 2018 (GWh)	Percentage of Total Energy Usage in 2018
Morro Agudo, Vazante, Três Marias and Juiz de Fora	Enercan Consortium	Campos Novos	21.0%	675.54	41.6%
	Picada	Picada	100.0%	264.26	16.3%
	Amador Aguiar I	Amador Aguiar I	12.6%	152.88	9.4%
	Amador Aguiar II	Amador Aguiar II	12.6%	132.25	8.2%
	Votener	N/A	N/A	144.04	8.9%
Vazante and Três Marias	Igarapava	Igarapava	23.9%	253.41	15.6%
Total Energy Usage	—	—	—	1,622.39	100.0%

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Other Operations

Hydroelectric plants

Campos Novos

Campos Novos is a hydroelectric plant located along the Canoas River. The plant has an installed capacity of 880 MW and has been authorized by ANEEL, to produce 377.90 MWavg. During 2018, the plant generated a total of 3,216.87 GWh. 21.0% of the total generation is allocated to our operating plants. During 2018, our Morro Agudo, Vazante, Três Marias and Juiz de Fora units consumed 675.54 GWh from Campos Novos, which represented approximately 41.6% of our total energy usage.

Picada

Picada is a hydroelectric plant located along the Peixe River. The plant has an installed capacity of 50 MW and has been authorized by ANEEL to produce 27 MWavg. During 2018, our Morro Agudo, Vazante, Três Marias and Juiz de Fora units consumed 264.26 GWh, which represented 16.3% of our total energy usage.

Igarapava

Igarapava is a hydroelectric plant located along the Grande River. The plant has an installed capacity of 210 MW and has been authorized by ANEEL to produce 130.51 MWavg. During 2018, our Morro Agudo, Vazante, Três Marias and Juiz de Fora units consumed 253.41 GWh from Igarapava, which represented approximately 15.6% of our total energy usage.

Amador Aguiar I

Amador Aguiar is a hydroelectric plant located along the Araguari River. The plant has an installed capacity of 240 MW and has been authorized by ANEEL to produce 155 MWavg. During 2018, our Morro Agudo, Vazante, Três Marias and Juiz de Fora units consumed 152.88 GWh from Amador Aguiar III, which represented 9.4% of our total energy usage.

Amador Aguiar II

Amador Aguiar is a hydroelectric plant located along the Araguari River. The plant has an installed capacity of 210 MW and has been authorized by ANEEL to produce 131 MWavg. During 2018, our Morro Agudo, Vazante, Três Marias and Juiz de Fora units consumed 132.25 GWh from Amador Aguiar II, which represented 8.2% of our total energy usage.

Sustainability initiatives

Nexa Resources has an integrated management system based on the ISO 14,000 series of environmental management standards, with an emphasis on the control of specific risks for mining. This system includes sustainability guidelines for new projects, including meeting the corporate goals of eight material issues: waste, energy and emissions, water, local development, health and safety, people, human rights and decommissioning. To ensure that project managers are aligned with these guidelines, the process includes an assessment of the phase change of a project, aligned with project management methodology front-end loading.

Health, safety and environmental compliance

Health and safety in the workplace are among our highest priorities, and our policies and procedures seek to eliminate accidents. We have sought to improve our safety record in conformity with standards in the mining industry. In 2018, our total recordable injury frequency rate was 2.23, compared to 2.46 in 2017 and 2.25 in 2016. This rate is defined as the number of injuries with and without lost time compared to millions of man hours worked. In 2018, our lost worktime incident rate was 1.01, compared to 1.15 in 2017 and 0.73 in 2016. This rate is defined as the number of injuries with lost time compared to millions of man hours worked. Our severity rate for 2018 was 77, compared to 1,384 in 2017 and 502 in 2016. To calculate the severity rate, we consider the sum of lost, transported and debited days, divide this figure by the total number of man hours worked and multiply the resulting number by 1,000,000.

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Other Operations

Mining is an activity that involves substantial risks. In 2017, we had seven fatalities at our Peruvian operations. Following these occurrences, we conducted a comprehensive review, and our board of directors approved a plan for the Company's Brazilian and Peruvian operations with three main safety-related objectives: (1) prevent fatalities; (2) reduce the frequency and severity of injuries; and (3) improve safety culture, particularly in our Peruvian operations. It includes initiatives related to leadership development and training for our employees and third-party contractors, preventive procedures, such as digital mining, and an automation plan. This plan has facilitated the improvement of our health and safety indicators, including zero fatalities in 2018.

We also operate programs aimed at improving working conditions, including medical services, for our mining operations and monitoring employees' health.

RESERVES

Disclosure of mineral reserves

This report contains disclosure that has been prepared in accordance with the requirements of Industry Guide 7 promulgated by the SEC, or Industry Guide 7.

As a reporting issuer in Canada, we are subject to National Instrument 43-101—*Standards of Disclosure for Mineral Projects*, or NI 43-101, which is an instrument administered by the provincial and territorial securities regulatory authorities that governs how issuers in Canada disclose scientific and technical information about their mineral projects to the public. NI 43-101 imposes certain requirements in respect of such disclosure, including the requirement to have prescribed information prepared by, or under the supervision of, a qualified person and the filing of NI 43-101 technical reports in the prescribed circumstances. We reference those reports in this report for informational purposes only, and such reports are not incorporated herein by reference.

NI 43-101 requirements differ significantly from the requirements under Industry Guide 7. Among other things, Industry Guide 7 does not contemplate the term “resource,” and the requirements under Industry Guide 7 for identification of “reserves” are not the same as the requirements under NI 43-101. Under Industry Guide 7, mineralization may not be classified as a “reserve” unless the determination has been made that the mineralization could be economically and legally produced or extracted at the time the reserve determination is made. Under Industry Guide 7, a “final” or “bankable” feasibility study is required to report reserves; the three-year historical average price, to the extent possible, is used in any reserve or cash flow analysis to designate reserves; and the primary environmental analysis or report must be filed with the appropriate governmental authority. One consequence of these differences is that “reserves” calculated in accordance with Canadian requirements may not qualify as “reserves” under Industry Guide 7 standards.

Descriptions in this report of our mineral deposits prepared in accordance with Industry Guide 7, as well as similar information provided by other issuers in accordance with Industry Guide 7, may not be comparable to similar information prepared in accordance with NI 43-101 that is presented elsewhere outside of this report.

Disclosures of mineral reserves in this report have not been adjusted to reflect our ownership interest of the entities that ultimately own the assets. The information includes each mine, smelter and project of our consolidated subsidiaries, presented as a whole; however, we do not own undivided equity interests in certain of these mines and projects.

Thiago N. Teixeira, B.Eng., FAusIMM, a Nexa Resources employee, has reviewed and approved the scientific and technical information contained in this Form 20-F, and is a “qualified person” for the purpose of NI 43-101.

For a table summarizing the mineral reserves estimates prepared in accordance with Industry Guide 7 for our mines, see “Information on the Company—Mining operations” below. For the meanings of certain technical terms used in this report, see “Additional Information—Glossary.”

Presentation of information concerning reserves

The estimates of proven and probable ore reserves at our mines and projects and the estimates of mine life included in this annual report have been prepared by our staff of experienced geologists and engineers, unless otherwise stated, and in accordance with the technical definitions established by the SEC. Under the SEC’s Industry Guide 7:

- Reserves are the part of a mineral deposit that could be economically and legally extracted or produced at the time of the reserve determination.
- Proven reserves are reserves for which (a) quantity is computed from dimensions revealed in outcrops, trenches, workings or drill holes; grade and/or quality are computed from the results of detailed sampling; and (b) the sites for inspection, sampling and measurement are spaced so closely and the geologic character is so well defined that size, shape, depth and mineral content of reserves are well-established.

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Reserves

- Probable reserves are reserves for which quantity and grade and/or quality are computed from information similar to that used for proven reserves, but the sites for inspection, sampling and measurement are farther apart or are otherwise less adequately spaced. The degree of assurance, although lower than that for proven reserves, is high enough to assume continuity between points of observation.

We periodically revise our reserve estimates when we have new geological data, economic assumptions or mining plans. During 2018, we performed an analysis of our reserve estimates for certain operations, which is reflected in new estimates as of December 31, 2018. Reserve estimates for each operation assume that we either have or expect to obtain all of the necessary rights and permits to mine, extract and process mineral reserves at each mine. Where we own less than 100% of the operation, reserve estimates have not been adjusted to reflect our ownership interest. Certain figures in the tables, discussions and notes have been rounded. For a description of risks relating to reserves and reserve estimates, see “Risk factors—Risks related to our mineral reserves.”

Our reserve estimates are based on certain assumptions about future prices. We have determined that our reported reserves could be economically produced if prices for the products identified in the following table were equal to the three-year average historical prices from October 1, 2015 to September 30, 2018. For this purpose, we used the three-year historical average prices set forth in the following table.

Commodity	Three-year average historical price
Zinc	US\$2,551 per tonne
Lead	US\$2,120 per tonne
Copper	US\$5,742 per tonne
Silver	US\$16.65 per oz.
Gold	US\$1,249 per oz.

(1) Reserves prices were updated on different prices, each calculated on the basis of the average price of the previous three years. For more information, see the footnotes to the table of reserves estimates below.

In October 2018, the SEC adopted revisions to mining disclosure rules in order to modernize the property disclosure requirements for mining registrants and related guidance. The changes bring the reporting guidance up to date with advances made in the industry and global regulatory practices for mineral reserve determinations. We are studying the impact of the new SEC guidelines for reporting of our mineral reserves estimates. The new SEC guidelines have not gone into effect and have not been used in the determination of our mineral reserves estimates for year-end 2018.

Mining operations

The following table shows our estimates of mineral reserves prepared in accordance with Industry Guide 7 and other information about our mines as of December 31, 2018. The Atacocha mine and the Morro Agudo mine do not have known mineral reserves under Industry Guide 7.

	Ownership Interest ⁽¹⁾ (%)	Class	Total (millions of tonnes)	Grade					Contained Metal Content				
				Zinc	Copper	Silver (g/tonne)	Lead (%)	Gold (g/tonne)	Zinc (thousands of tonnes)	Copper (thousands of tonnes)	Silver (kg)	Lead (thousands of tonnes)	Gold (kg)
				(%)	(%)		(%)						
Cerro Lindo Mine⁽²⁾	80.16	Proven	33.88	1.87	0.66	21.0	0.21	—	633.6	223.6	712,158	71.1	—
		Probable	14.32	1.55	0.73	20.8	0.17	—	222.0	104.5	298,142	24.3	—
		Subtotal	48.20	1.77	0.68	21.0	0.20	—	855.5	328.1	1,010,300	95.5	—
El Porvenir Mine⁽³⁾	80.16	Proven	8.69	3.62	0.20	59.8	1.00	—	314.6	17.4	519,662	86.9	—
		Probable	7.59	4.04	0.22	50.6	0.91	—	306.6	16.7	384,054	69.1	—
		Subtotal	16.28	3.82	0.21	55.5	0.96	—	622.2	34.2	904,095	156.4	—
Vazante Mine⁽⁴⁾	100	Proven	10.11	10.09	—	16.4	0.30	—	1,020.1	—	166,006	30.3	—
		Probable	7.75	9.36	—	11.2	0.25	—	725.4	—	86,413	19.4	—
		Subtotal	17.86	9.77	—	14.1	0.28	—	1,745.5	—	252,419	49.7	—
Total		Proven	52.68	3.74	0.46	26.5	0.36	—	1,968.2	241.0	1,397,826	188.4	—
		Probable	29.66	4.23	0.41	25.9	0.38	—	1,254.0	121.2	768,609	112.8	—
		Total	82.34	3.91	0.44	26.3	0.37	—	3,222.2	362.2	2,166,435	301.2	—

Notes: Totals may not sum due to rounding.

- (1) The production and content amounts presented in this table have not been adjusted to reflect our ownership interest. The information presented in this table includes 100% of the mineral reserve estimates of our consolidated subsidiaries and of our joint ventures, certain of which are not wholly-owned, as set out in this ownership interests column.
- (2) The mineral reserve estimates with respect to our Cerro Lindo mine were prepared by Nexa Resources. Mineral reserves are reported within engineered stope outlines assuming the following underground mining methods: sublevel open stoping (SLOS) or vertical retreat mining (VRM) with paste backfill, and mechanized drift and fill/cut and fill (D&F/C&F) with paste backfill. Typical SLOS stopes are 20m high x 20m long x 30m deep. Typical D&F/C&F rooms are 4 m x 4 m. Mineral reserves incorporate dilution and mining recovery. Mineral processing by flotation concentration is assumed. Mineral reserves are reported at different net smelter return (NSR) cut-off values, depending on the mining method used: a) for SLOS/VRM with paste backfill, the NSR cutoff is US\$31.56/t; and b) for D&F/C&F, the NSR cut-off is US\$40.28/t. The NSR calculations are based on head grade and historical plant performance. Metal prices used for the NSR calculation are three-year trailing average as allowed under Industry Guide 7: Zn: US\$ 2,551/t; Pb: US\$ 2,120/t; Cu: US\$ 5,742/t and Ag: US\$ 16.65/oz. NSR calculations are based on polynomial equations for each of the concentrate elements and consider sliding smelter payments that vary depending on the grade of the concentrate. Nexa Resources entered into a silver streaming agreement with Triple Flag that began in December, 2016. As a result, revenues from silver sales will be lower than the assumed price. The reduced silver revenue has not been considered in NSR calculations or cut-off grade but is not expected to materially affect the estimates. The revenue reduction has been included in financial analysis.
- (3) The mineral reserve estimates with respect to our El Porvenir mine were prepared by Nexa Resources and reviewed by RPA, an independent mining consultant. Mining methods applied at our El Porvenir mine include overhand C&F and sublevel stoping (SLS). Mineral reserves are estimated at NSR cut-offs of US\$56.15/t and US\$ 48.38/t processed for C&F and SLS, respectively.

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The NSR cut-offs are calculated based on the life of mine costs: for mining US\$ 38.58/t and US\$ 30.81/t for C&F and SLS respectively, for processing US\$ 9.88/t, and other costs US\$7.69/t. Metal prices used for the NSR calculation are the three-year trailing average as allowed under Industry Guide 7 with Zn: US\$ 2,551/t; Pb: US\$ 2,120/t; Cu: US\$ 5,742/t and Ag: US\$ 16.65/oz. NSR is calculated using stope head grades, after application of six modifying factors, including: (i) estimated metallurgical recovery and commercial terms treatment charge; (ii) refining charge; (iii) payable percentages, (iv) deductions, (v) penalties and (vi) freight cost at an exchange rate of 3.30 PEN/US\$. Mineral reserves are reported within engineered stope outlines assuming C&F and SLS underground mining methods with hydraulic and unconsolidated waste fill. Typical C&F stopes are 5m high with a minimum mining width of 5m. Typical SLS stope dimensions are 20m high x 30m long with a minimum mining width of 4m. Mineral reserves incorporate dilution and mining recovery. Bulk density ranges from 2.77 t/m³ to 4.01 t/m³. Mineral processing by flotation concentration is assumed. Metallurgical recoveries are based on a recovery versus head grade curve, supported by historical plant performance. Average process plant recoveries are: Zn 90.1%; Pb 75.3%; Cu 15.8%; and Ag 61.9%.

- (4) The mineral reserve estimates with respect to Vazante mine were prepared by Nexa Resources. Mineral reserves are reported within engineered stope outlines assuming the following underground mining methods: SLOS, VRM with rock backfill, and mechanized C&F with rock backfill. Typical stope dimensions are 30m high x 60m long x 6m deep. A minimum mining width of 4m is applied to all stopes. Typical C&F rooms are 4m x 4m. Mineral reserves incorporate dilution and mining recovery factors. All mineral reserves are reported at a net smelter return (NSR) cut-off value independent of the mining method. SLOS/VRM and C&F are reported with an NSR cutoff of \$US\$67.63/t. Mineral processing by flotation concentration is assumed. The NSR calculations are based on head grade mill recoveries of 84.2% Zn, 20.6% Pb and 36.3% Ag. Metal prices used for the NSR calculation are three-year trailing average as allowed under Industry Guide 7: Zn: US\$2,551/t; Pb: US\$2.120/t and Ag: US\$16.65/oz. NSR calculations are based on polynomial equations for each of the concentrate elements, and consider sliding smelter payments that vary depending on the grade of the concentrate.

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Capital Expenditures

CAPITAL EXPENDITURES

Our capital expenditures from January 1, 2016 through December 31, 2018 totaled US\$680.3 million and we have budgeted US\$420.0 million for 2019 for investments in projects that are currently underway, reflecting a 40.0% increase compared to our 2018 investment budget. The following table sets forth our capital expenditures for the periods indicated.

	For the Year Ended December 31,		
	2018	2017 (in millions of US\$)	2016
Capital Expenditures			
Expansion⁽¹⁾			
Vazante Mine Deepening Project	47.5	30.1	15.8
Ambrósia	1	11.8	5.2
Extremo Norte	—	0.6	8.4
Jarosita	14.4	—	—
Aripuanã	18.8	3.6	—
Magistral	8.7	—	4.0
Others	0.1	2.7	8.0
Total Expansion	90.5	48.8	41.4
Modernization			
Projects to reduce operating costs	4.5	6.2	4.2
Projects to improve product quality	4.1	4.6	5.7
Projects for operational gains	6.1	8.8	7.6
Others	0.3	1.8	2.1
Total Modernization	15.0	21.4	19.6
Sustaining			
Equipment replacement	21.6	15.9	9.5
Equipment updates	9.7	5.8	8.3
Mining equipment replacement	26.6	12.8	18.4
New equipment installation	15.2	13.7	0.7
Others	17.1	11.2	17.2
Total Sustaining	90.2	59.4	54.1
Health, Safety and Environment			
Electrical substation	26.7	36.3	29.8
Firefighting systems	5.9	5.2	1.9
Waste treatment	38.9	11.7	20.0
Others	17.6	8.9	6.8
Total Health, Safety and Environment	89.1	62.1	58.5
Others			
Manufacturing execution system	11.7	2.4	1.5
Others	—	3.7	1.3
Total Others	11.7	6.1	2.9
Subtotal	296.5	197.8	176.5
Reconciliation to Financial Statements ⁽²⁾	3.2	(0.2)	6.5
Total	299.7	197.6	183.0

(1) For a description of the projects, see “Information on the Company—Mining operations—Growth projects.”

(2) The amounts under “Reconciliation to Financial Statements” are related to capitalization of interest net of advanced payments.

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Capital Expenditures

Our main capital expenditures during the years ended December 31, 2018, 2017 and 2016 include the following.

- In 2018, our capital expenditures were US\$299.7 million, mainly allocated to the following projects: the Vazante life of mine extension; implementation of dry stacking tailings disposal at Vazante; the start of construction at the Aripuanã greenfield project; and the change from the Goethite conversion process to the Jarosite conversion process at Cajamarquilla.
- In 2017, our capital expenditures were US\$197.6 million, allocated to the following projects: the Vazante mine deepening project, for which the largest investment was in excavation; waste treatment and dam projects at Três Marias and El Porvenir; the Ambrosia mine project, for which the largest investment was in excavation; and a pump station project at Vazante.
- In 2016, our capital expenditures were US\$183.0 million, allocated to the following projects: the Vazante Mine Deepening Project, for which the largest investment was in excavation; the Vazante Extremo Norte project, for which the largest investments were in excavation, construction and equipment installation; and the installation of a gas scrubber in Cajamarquilla to reduce the sulfur dioxide content of our emissions.

For 2019, we have budgeted US\$420.0 million to invest in projects that are currently underway. Our main projects include (i) US\$140.0 million for the Aripuanã project construction; (ii) US\$24.0 million for the Vazante mine deepening to extend its life of mine; and (iii) US\$24.0 million for the Jarosite conversion process at the Cajamarquilla smelter.

We expect to meet these capital expenditure needs from our operating cash flow. We may incur indebtedness to finance a portion of these expenditures, particularly if financing is available at attractive terms. Our actual capital expenditures may vary from the expected amounts we have described here, both in terms of the aggregate capital expenditures we actually incur and when we incur them.

REGULATORY MATTERS

Brazilian regulatory framework

Mining rights and regulation of mining activities

Mining activities in Brazil are governed by the Brazilian Federal Constitution of 1988, the Brazilian Mining Code and other decrees, laws, ordinances and regulations, such as the Decree nº 9.406/2018 which renewed the regulation of the Mining Code. These regulations impose several obligations on mining companies relating to, among other things, the way mineral deposits are exploited, the health and safety of workers and local communities where mines are located, and environmental protection and remediation measures. They also set forth the Brazilian federal government's jurisdiction over, and scope of activities within, the industry. The MME and ANM regulate mining activities in Brazil. As of July 2017, the ANM replaced the DNPM, and is responsible for monitoring, analyzing and promoting the performance of the Brazilian mineral economy, granting rights related to the exploration and exploitation of mineral resources and other related activities in Brazil.

Under the Brazilian Federal Constitution, surface property rights are distinct from mineral rights, which belong exclusively to the Brazilian federal government, the sole entity responsible for governing mineral exploration and mining activity in Brazil.

Summary of Brazilian concessions

In Brazil, we hold exploration authorizations (*autorizações de pesquisa*), mining concessions (*concessões de lavra*), mining concession requests (*requerimento de lavra*) and exploration authorizations requests (*requerimentos de pesquisa*), which we broadly and collectively refer herein to as mineral rights, that cover a total area of 2,394,686.39 hectares, of which: (i) 1,993,712.54 hectares, or 80.0%, are exploration authorizations, (ii) 4,970.52 hectares, or 1.0%, are mining concessions, (iii) 11,986.57 hectares, or 2.0%, are mining concession requests, and (iv) 384,016.76 hectares, or 17.0%, remain as exploration authorization requests and are presently under initial geological reconnaissance.

In addition to Vazante and Morro Agudo, we held a third mine concession in Fortaleza de Minas, where nickel production activities have been suspended since 2013 due to international market conditions. The price of nickel is not expected to recover to historical levels due to structural changes in supply, as low-cost nickel pig-iron production has replaced a substantial share of traditional nickel sources. Nickel is currently not part of our strategic plan. In May 2018, we entered into an agreement to sell assets and transfer certain liabilities of the Fortaleza de Minas facility.

The term of each of the mining concessions mentioned above is valid for the life of the mine, evaluated pursuant to the specific mining project. All our mineral rights in Brazil are in good standing. Maintaining our mineral rights in Brazil in good standing involves: (i) maintaining production on the mineral concessions and/or satisfying the ANM's requirements if production has been suspended; (ii) developing exploration work and paying an annual property fee for the exploration authorizations; and (iii) complying with all the legal requirements, including not only as to mining, but also as to environmental and real estate requirements applicable to claiming a property with respect to exploration applications.

Failure to pay the applicable fees for any given year will result in us forfeiting our mineral rights. As of December 31, 2018, we have paid all applicable royalties, taxes and fees on our mineral rights. Our mineral rights in Brazil that are not currently undergoing exploration or production will not expire unless we fail to timely pay the applicable royalties, taxes and fees, as well as the applicable penalties and meet the ANM's and environmental authorities' requirements, as applicable. See "Information on the Company—Regulatory matters—Brazilian regulatory framework—Royalties and other taxes on mining activities."

The following table summarizes our mineral rights in Brazil.

	Project	Mineral Rights	
		Titles	Area (hectares)
Mines	Morro Agudo / Ambrósia Trend	6	3,941.92
	Vazante mine	8	2,091.10
Greenfield Projects	Aripuanã	4	3,640.72
	Caçapava do Sul	3	2,947.32
Prospective Projects	Various	904	2,382,065.33
		925	2,394,686.39

Exploration authorization and mining concession regimes

Exploration authorizations grant the rights to conduct exploration activities for a period from one to three years, which may be renewable for an additional period (and potentially additional renewals on a case-by-case basis). Exploration authorizations are granted on a first come, first serve basis, and the ANM will only grant one exploration authorization for any given area. Mining concessions are currently valid until the mineral deposit reserves are exhausted. Mining concessions may be transferred to eligible third parties with the ANM's prior approval, pursuant to applicable legislation.

Decommissioning

In Brazil, enterprises dedicated to the exploitation of mineral resources shall submit a recovery plan to receive a mining concession. Accordingly, the environmental recovery of the degraded areas caused by mineral exploitation activities shall have been planned since their conception. According to Minas Gerais law, entrepreneurs must also submit to the environmental agency an environmental plan for closing two years before the planned mine closing.

The state of Minas Gerais has also passed legislation on decommissioning plans for industrial activities. The Três Marias unit was the first metal production operation to prepare a decommissioning plan at the licensing stage, including the calculation of a financial provision. In the case of the Aripuanã and Caçapava do Sul greenfield projects, presentation of a decommissioning plan is one of the requirements for obtaining an environmental license.

Royalties and other taxes on mining activities

Revenues from mining activities are subject to CFEM (*Compensação Financeira pela Exploração de Recursos Minerais*), which is paid to the ANM. CFEM is a monthly royalty based on the sales value of minerals, net of taxes levied on the respective sale. When the produced minerals are used in its internal industrial processes, CFEM is determined based on the costs incurred to produce them. CFEM is determined by a reference price of the respective mineral to be defined by the ANM. The applicable rate varies according to the mineral product (currently 2.0% for zinc, lead, copper and silver). In addition, we are required to make certain fee payments for exploration authorizations known as the Annual Fee per Hectare (*Taxa Anual por Hectare*). There is also a monthly inspection fee related to the transfer and commercialization of certain minerals in some Brazilian states, such as Minas Gerais, where the concessions are located.

Environmental regulations

We are subject to several environmental regulations related to, among other matters, water resources, caves, waste management, contaminated areas, areas of permanent preservation, and conservation of protected areas. Specifically, we have taken the following actions regarding contaminated areas and areas of permanent preservation:

Contaminated areas. We have carried out environmental assessments on our operation units to verify the existence of contamination in groundwater and soil. The assessments prepared for the Brazilian units identified deviations in soil, groundwater and surface water quality standards. We are committed to improving the

management of areas identified as contaminated. For most of the identified deviations, we developed a robust remediation plan in order to comply with all legal requirements. We recorded provisions in our consolidated financial statements in respect of any potential liabilities associated with these deviations from applicable standards. See “Operating and financial review and prospects—Overview—Key factors affecting our business and results of operations—Environmental expenses.” We continue to conduct similar assessments with respect to the Peruvian operating units.

Areas of permanent preservation. Permanent Preservation Areas (*Áreas de Preservação Permanente*, or APP) are areas that, because of their importance for preserving water resources, geological stability, biodiversity protection and erosion control, receive special legal protection. The existence of such protected areas within a property, whether in urban or rural locations, may cause restrictions to the performance of the intended activities. Interference or removal of APP vegetation is only allowed in cases of public utility (such as mining activities), social interest or low environmental impact, if there is a prior authorization from the applicable environmental authorities. Most of our properties in the state of Minas Gerais interfere in APPs in some way. For such properties, we have either already established an advanced ongoing regularization process or have started the process for other properties. The regularization process includes the implementation of rigid controls over the properties.

Environmental licenses

The Brazilian Federal Constitution grants federal, state and municipal governments the authority to issue environmental protection laws and to publish regulations based on those laws. While the Brazilian federal government has authority to issue environmental regulations setting general standards for environmental protection, state governments have the authority to issue stricter environmental regulations. Municipal governments may only issue regulations regarding matters of local interest or as a supplement to federal or state laws.

Under Brazilian law, the construction, installation, expansion and operation of any establishment or activity that uses environmental resources, or is deemed to be actually or potentially polluting, as well as those capable of causing any kind of environmental degradation, is subject to a prior licensing process.

Notably, in addition to the general guidelines set by the Brazilian federal government, each state is legally competent to promulgate specific regulations governing environmental licensing procedures under its jurisdiction. Depending on the level of environmental impact caused by the exploration/exploitation activities, the procedures for obtaining an environmental license may require assessment of the environmental impact and public hearings, which may considerably increase the complexity and duration of the licensing process and expose the exploration/exploitation activities to potential legal claims.

Environmental liability

Environmental liability may be determined by civil, administrative and criminal courts, with the application of administrative and criminal sanctions, in addition to the obligation to redress the damages caused. All our operating units have obtained certification under the ISO 14001 standard.

Regulation of dams

The state of Minas Gerais has recently enacted regulations affecting the use of dams, including tailings dams and effluent dams, in the state. In January 2019, local authorities enacted regulations that mandate the decommissioning of all upstream tailings dams and prohibit construction of new tailings dams using the upstream method. In February 2019, local authorities enacted regulations that prohibit the construction of a new dam or the expansion of existing dams if communities are established within areas encompassing the portion of the valley downstream of the dam. As of the date of this report, we are continuing to assess the potential impact of these regulations on our operations. For more information, see “Risk factors—Operational risks—The failure of a tailings dam could negatively impact our business, reputation and results of operations” and “Information on the Company—Mining operations—Tailings disposal.”

Regulation of other activities

In addition to mining and environmental regulation, we must abide by regulations related to, among other things, the use of explosives and fuel storage. We are also subject to more general legislation on labor, occupational health and safety, and support of communities near mines, among other matters.

Peruvian regulatory framework

Mining rights and regulation of mining activities

The General Mining Law (*Texto Único Ordenado de la Ley General de Minería*) is the primary law governing both metallic and non-metallic mining activities in Peru and is complemented by other regulations approved by the MINEM. Under the General Mining Law, mining activities such as exploration, exploitation, mining labor, beneficiation and mining transport (except storage, sampling, prospecting and trade) are carried out exclusively by means of concessions. The DGM (*Dirección General de Minería*) is the regulatory body of the MINEM responsible for proposing and evaluating regulations in the Peruvian mining sector as well as authorizing the commencement of mining activities in Peru.

A mining concession allows its holder to carry out exploration and exploitation activities within the area established in the respective concession title, provided that prior to the beginning of any mining activity, such concession title is granted by the INGEMMET (*Instituto Geológico, Minero y Metalúrgico*) and other applicable administrative authorizations are obtained (e.g., mining, environmental, use of water, use of explosives, etc.). A concession provides its titleholder with the exclusive right to undertake mineral exploration and mining activity within a determined area but does not grant the titleholder the right to own the surface land where the concession is located. Therefore, for the holder of a mining concession to develop exploration and/or exploitation works, the latter has to purchase the corresponding surface land from the owners, reach an agreement for its temporary use or obtain the imposition of a legal easement by the MINEM, which is rarely granted. There are special proceedings for purchasing or acquiring temporary rights over barren lands owned by the state.

Summary of Peruvian concessions

In Peru we hold, through Nexa Peru and its subsidiaries, 889 mining and exploration concessions, which cover a total area of over 393,687.76 hectares. Of our mines in Peru, the Atacocha mine property includes 147 mining concessions that cover an area of 2,872.51 hectares, the El Porvenir mine property includes 25 mining concessions that cover an area of 4,846.77 hectares, the Cerro Lindo mine has 54 mining concessions, and one beneficiation concession that cover an area of 33,516.54 hectares and the inactive Chapi mine property includes 32 mining concessions that cover an area of 4,625.56 hectares. In addition, we have 218 mineral rights concessions for greenfield projects in Peru that cover a total area of 81,207.52 hectares. Our prospective projects include 413 mining concessions that cover an area of 266,618.87 hectares.

All our mining and processing concessions in Peru are in good standing. Maintaining our concessions in Peru in good standing involves, among other requirements, (i) paying the annual validity fee and production penalties (when applicable) for mining concessions with no production or with no effective exploration or (ii) paying the annual validity fee and complying with minimum production or investment requirements established in mining law.

Failure to pay such validity fees or production penalties (when applicable) for two consecutive years results in the cancellation of the respective mining concessions or benefit concessions granted by the Peruvian government. Our mining and benefit concessions will not expire unless we do not comply in paying these fees or complying with minimum production or investment requirements as required by law and depending on the applicable regime.

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Regulatory Matters

The following table summarizes our mining concessions in Peru.

	Project	Concessions	
		Titles	Area (hectares)
Mines	Atacocha mine	147	2,872.51
	El Porvenir mine	25	4,846.77
	Cerro Lindo mine	54	33,516.54
	Chapi mine (inactive)	32	4,625.56
Greenfield Projects	Florida Canyon Zinc	16	12,600.00
	Chapi Greenfield	14	5,855.60
	Hilarión	68	14,516.47
	Magistral	34	14,495.17
	Pukaqaqa	34	11,131.29
	Shalipayco	52	22,608.99
Prospective Projects	Various	413	266,618.87
Total		889	393,687.76

Exploration and authorization and mining concession regimes

Mining concessions are granted for an indefinite term, though dependent on the fulfillment of certain legal obligations. The commencement and re-commencement of exploration and/or exploitation mining activities are subject to the prior obtainment of an authorization for the commencement of activities before the DGM. Such authorizations could be subject to a prior consultation procedure if the DGM determines that development of the project could impact the rights of indigenous communities.

As of December 31, 2018, we primarily owned metallic mining concessions with respect to zinc, copper, silver and lead. Substantially all of Nexa Peru's concessions were granted prior to 2008. Our mining rights and concessions are in full force and effect under applicable Peruvian laws. We believe that we comply in all material respects with the terms and requirements applicable to our mining rights and concessions.

Decommissioning

Titleholders of mining exploitation and beneficiation activities, and, in some cases, of exploration activities require the prior approval of a mine closure plan, which includes the environmental rehabilitation, restoration and remediation measures that shall be executed along with the mining operations and until its closure. Once the corresponding mine closure plan is approved, an environmental guarantee must be granted in favor of the MINEM to back up the costs associated with the execution of the mine closure plan. Mining exploitation and beneficiation activities may only be initiated once the mine closure plan is approved and the corresponding environmental guarantee is duly submitted before the competent authority. The corresponding environmental guarantee is submitted yearly. If the titleholder of an ongoing mining operation fails to comply with this obligation, the MINEM is entitled to suspend the execution of such mining operation.

Royalties and other taxes on mining activities

Holders of mining concessions are required to pay a mining royalty (*regalía minera*) to the Peruvian government for the exploitation of metallic and non-metallic resources. The amount of the royalty is now payable on a quarterly basis and is equal to the greater of (i) an amount determined in accordance with a statutory scale of marginal tax rates from 1.0% to 12.0% based on a company operating income margin and applied to the company's operating income and (ii) 1.0% of a company's sales, in each case during the applicable quarter. We are required to pay annual fees (*derecho de vigencia*) for our mining concessions and, in some cases, mining production penalties for not reaching the minimum production levels set by Peruvian mining law.

Holders of mining concessions are also required to pay a Special Mining Tax (*Impuesto Especial a la Minería*) to the Peruvian government. The Special Mining Tax is payable on a quarterly basis and is calculated based on the operating income derived exclusively from the sale of metallic resources, with marginal rates between 2.0% and 8.4%.

Holders of mining concessions that are subject to administrative legal stability (in force as of the effective date) under an Agreement of Guarantees and Measures for Investment Protection entered into with the MINEM and Mining shall enter into an agreement with the Peruvian government for the payment of a Special Charge on Mining (*Gravamen Especial a la Mineral*). The Special Charge on Mining is payable on a quarterly basis and is calculated based on the operating income derived exclusively from the sale of metallic resources, with marginal rates between 4.00% and 13.12%.

Tax stability agreements

On March 26 of 2002, Nexa Peru entered into an Agreement of Guarantees and Measures for Investment Protection with MINEM with respect to our Cerro Lindo unit. Pursuant to section 9 of said Agreement, until December 31 of 2021, certain guarantees will benefit with respect to operations of the Cerro Lindo unit including, among others, free commercialization of the products proceeding from such unit, free disposition of the currencies generated from the export of the products proceeding from such unit, the right to use the global depreciation rate applicable on the fixed assets relating to the Cerro Lindo unit up to 20.0% per year, the right to keep the accounting corresponding to the Cerro Lindo unit in U.S. dollars, and tax stability.

Municipal permits

The regularization process for Nexa CJM's administrative offices and construction permits was fully completed on September 22, 2017. The process for a permit for construction of a new locker room at Nexa CJM's facilities is currently underway. Nexa CJM is also in the final stage of the process to obtain a municipal license for the operation of its water catchment plant located in Carapongo, Peru.

Environmental regulations

The development of economic activities in the Peruvian territory, such as those related to the mining industry, are subject to a broad range of general environmental laws and regulations related to the generation, storage, handling, use, disposal and transportation of hazardous and controlled materials; the emission and discharge of hazardous materials into the ground, air or water; and the protection of migratory birds and endangered and threatened species and plants. These regulations also set environmental quality standards for noise, water, air and soil, which shall be considered for the preparation, assessment and approval of the corresponding environmental management instrument.

The Ministry of Environment and other administrative entities, such as the DGAAM (*Dirección General de Asuntos Ambientales Mineros*), have the authority to enact regulations related to environmental matters. Additionally, the Environmental Supervision Agency (*Organismo de Evaluación y Fiscalización Ambiental*, or OEFA), is the competent authority in charge of regulating, supervising and imposing sanctions on mining companies upon non-compliance of applicable environmental legislation. In addition, there are other competent governmental agencies or authorities on specific environmental matters such as water, forestry resources, and aquatic environment that regulate and supervise environmental compliance and liability.

Environmental permit regularization processes

Supreme Decree 040-2014-EM provided special procedures allowing us to acquire environmental and operational permits for mining operations and to regularize the mining of certain areas within the Cerro Lindo and Atacocha mines and to regularize the construction and operation of certain mining components in Nexa CJM's "Poza de Lodos Neutros" and "Poza No. 5," which lacked the corresponding mining and environmental permits. With respect to Cerro Lindo, this permit regularization process was fully completed on July 5, 2017. With respect to the Atacocha mine, on December 18, 2017, we completed the permit regularization with respect to the areas that will be exploited. With respect to Nexa CJM's "Poza de Lodos Neutros," the regularization process has concluded and, therefore, this component currently has sufficient environmental and mining permits in place. With respect to Nexa

CJM's "Poza No. 5," the regularization process is in its final stage with respect to the mining permits. These regularization procedures are independent from any sanctioning administrative procedure that the OEFA may initiate in connection with the construction and operation of mining components without the corresponding environmental permits.

Regulation of other activities

In addition to mining and environmental regulation, we must abide by regulations related to, among other activities, the use of explosives, fuel storage, and electricity concessions. We are also subject to more general legislation on labor, occupational health and safety, and peasant and indigenous communities, among others.

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II. OPERATING AND FINANCIAL REVIEW AND PROSPECTS

OVERVIEW

Executive summary

In 2018, we focused on increasing production capacity at our mines and pursuing exploration activities that aim to replenish the reserves that we mine each year. We continued to develop our pipeline of growth projects (both greenfield and brownfield), including receipt of an installation license in the second half of 2018 that allowed the start of construction of the Aripuanã project, with the objective of using innovative initiatives to increase production while reducing third-party zinc concentrate supply needs. We also continued to focus on strengthening the relationship with our shareholders, including through the commencement of a share buyback program in November 2018.

The most significant factors impacting our results in 2018 included higher development expenses and slightly slower production at Cerro Lindo associated with our planned advances in mine development throughout the year, including developing new stopes and galleries, which allowed us to accelerate production. Finally, the Brazilian *real* devaluation was also a significant factor. Although we experienced a slight slowdown in mine production due to the initiatives implemented at Cerro Lindo, we believe the accelerated investments in 2018 are crucial to support Cerro Lindo's production growth going forward. This is already reflected in improved production volumes during the last quarter of 2018. At the beginning of 2018, we estimated that we would produce between 370.0 thousand tonnes and 390.0 thousand tonnes of zinc, between 39.0 thousand and 42.0 thousand tonnes of copper, between 55.0 thousand tonnes and 60.0 thousand tonnes of lead, between 7,600 thousand ounces and 8,000 thousand ounces of silver and between 17.0 thousand ounces and 19.0 thousand ounces of gold. In the third quarter of 2018, we revised our lead and gold production estimates to between 50.0 thousand and 55.0 thousand tonnes of lead and 23.0 thousand to 25.0 thousand ounces of gold, respectively.

Despite the impact of the above-mentioned factors, particularly with respect to our Cerro Lindo mine, we were able to meet this production guidance within the estimated ranges for all metals and surpassed the top of the range of our guidance for gold. During the fourth quarter of 2018, our zinc equivalent production increased to 150.0 thousand tonnes from 135.0 thousand and 137.0 thousand tonnes produced in the second and third quarters of 2018, respectively. During the month of December, Cerro Lindo's processing plant reached record-high feeding volumes, resulting in the highest zinc, lead, and gold production levels for the year.

In 2018, we saw a 2.9% decrease in our mine production, from 572.4 thousand tonnes of zinc equivalent production in 2017 to 555.7 thousand tonnes in 2018, and a 3.9% increase in metal sales in our smelting operations, from 594.0 thousand tonnes in 2017 to 616.8 thousand tonnes in 2018.

In 2018, our net revenues were 1.7% higher compared to 2017, reaching US\$2,491.2 million, driven by slightly higher metal prices combined with higher metal sales but also impacted by lower sales volumes of by-products. In 2018, adjusted EBITDA was US\$604.8 million, a 9.4% decrease compared to 2017, primarily a result of higher costs and lower by-product credits mainly driven by lower London Metal Exchange (LME) prices.

Our capital expenditures totaled US\$299.7 million in 2018, a US\$102.1 million increase compared to 2017, which aligns with our growth strategy. In 2018, our primary focus was the life of mine extension at Vazante, which aims to extend the life of mine to 2029. We spent US\$47.5 million on the endeavor in 2018.

During 2019, we plan to work towards the following objectives:

- improve mining performance by increasing our zinc equivalent production with higher treated ore volumes, which we expect to offset lower grades;
- stabilize production at Cerro Lindo, as a result in part of the mining development initiatives carried out during 2018;
- stabilize production at the Cerro Pasco complex (El Porvenir and Atacocha) following our implementation of changes to safety procedures during 2018;

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- improve productivity in Brazil, mainly through the implementation of an additional worker shift at Vazante, which we expect to increase operating hours;
- maintain production levels in our smelting segment similar to those achieved in 2018, with lower conversion costs. We also expect to shift from the Goethite conversion process to the Jarosite conversion process at our Cajamarquilla smelter, which is aimed at improving recovery rates; and
- invest 35.0% of the total estimated capital expenditure of US\$392.0 million for the Aripuanã greenfield project.

In 2019, we estimate that we will produce between 375.0 thousand tonnes and 395.0 thousand tonnes of zinc contained in concentrate; between 37.0 thousand tonnes and 40.0 thousand tonnes of copper contained in concentrate; between 52.0 thousand tonnes and 57.0 thousand tonnes of lead contained in concentrate; between 8,000 thousand ounces to 8,600 thousand ounces of silver contained in concentrate; and between 21.0 thousand ounces and 23.0 thousand ounces of gold contained in concentrate. These estimates assume, among other things: (i) an increase in total treated ore volumes, which we expect to increase zinc production; (ii) lower grades, particularly in Cerro Lindo mine, in line with expectations; (iii) improved productivity in Vazante with the implementation of an additional work shift; and (iv) a slight increase in costs due to continued mine development initiatives and due to safety measures implemented in 2018.

In 2019, we expect to sell between 573.0 thousand tonnes and 591.0 thousand tonnes of metallic zinc product volume and between 37.0 thousand tonnes and 39.0 thousand tonnes of zinc oxide product volume. These estimates assume, among other things: (i) an increase in the performance of the roasters in all of our smelters; (ii) regular production through 2019 compared to 2018; and (iii) the potential short-term slowdown due to the implementation of the Jarosite conversion process at Cajamarquilla, followed by an estimated increase in our recovery rates thereafter.

In 2019, we also expect to incur approximately US\$128.0 million in mineral exploration and project development expenses, with US\$75.0 million allocated to mineral exploration and US\$53.0 million allocated to project development. In mineral exploration, we plan to continue our efforts to increase mineral reserves and resources. Our estimated mineral exploration expenses relate mainly to brownfield exploration (US\$36.0 million) and greenfield exploration (US\$33.0 million). Our estimated project development expenses includes US\$30.0 million directed towards projects in the scoping study and pre-feasibility study stages. Of this US\$30.0 million, US\$23.0 million relates to greenfield projects, including approximately US\$14.0 million for the Shalipayco project, and US\$7.0 million relates to brownfield projects.

These estimates should be considered preliminary and subject to change. We have provided ranges, rather than specific amounts, for these estimates based on several assumptions that management believes to be reasonable as of the date of this report. See “Forward-looking statements.”

Key factors affecting our business and results of operations

Reporting segments

We have two reportable segments: mining and smelting. A major part of our zinc mining production, representing approximately 98% of production in 2018, is processed in our own smelters. Similarly, a major part of the zinc concentrates used as raw material for our smelting operations, representing approximately 58% of concentrates in 2018, comes from our own mines. As a result, the revenues of our mining segment include sales to the smelting segment, and the costs of our smelting segment include purchases from the mining segment. We calculate internal transfer prices from our mines to the smelters on an arm’s length principle basis to evaluate the performance of our mining and smelting segments individually. These revenues and costs are eliminated in our consolidated financial statements.

The profitability of our mining segment depends primarily on world prices of the metals we produce, and on our costs to produce concentrates. It is also affected by treatment charges, which are amounts representing the

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cost of further processing that are applied to reduce the price of concentrate. Other factors affecting pricing are discussed below.

The profitability of our smelting segment does not depend directly on market prices for metals because they have a similar impact on our revenues and our costs. It is affected primarily by treatment charges (which reduce our costs to acquire concentrates), by the premium over the market price of metals that we can charge for our products, and by the operating costs of our smelters and their efficiency in recovering the metal content of the concentrates we purchase.

Segments are reported in accordance with IFRS 8 “Operating Segments,” and the information is presented to the chief executive officer. Segment results are derived from the accounting records and are adjusted for reallocations between segments, exceptional items, and transfer pricing adjustments. See Note 1 to our consolidated financial statements.

Metal prices

Our financial performance is significantly affected by the market prices of zinc, copper and lead, and, to a lesser extent, silver, gold and the other by-products of our smelting operations. Metal prices have historically been subject to wide fluctuations and are affected by numerous factors beyond our control, including the impact such factors have on industries representing first-uses and end-uses of our products. These factors, which affect each metal to varying degrees, include international economic and political conditions, levels of supply and demand, the availability and cost of substitutes, inventory levels maintained by producers and others and, to a lesser degree, inventory carrying costs and currency exchange rates. In addition, market prices have on occasion been subject to rapid short-term changes due to speculative activities.

The market prices for zinc, copper and lead are typically quoted as the daily cash seller and settlement price established by the LME. LME zinc prices are influenced by global supply and demand for metallic zinc and zinc oxide. The supply of metallic zinc and zinc oxide depends on the amount of zinc concentrates and secondary feed materials produced and the availability of smelting capacity to convert them into refined metal. This also applies to copper and lead.

The table below sets forth the average published market prices for the metals and periods indicated:

Average Market Prices of Base Metals	For the Year Ended December 31,					
	2018		2017		2016	
	(US\$/tonne)	(US¢/lb.)		(US\$/tonne)	(US¢/lb.)	
Zinc (LME)	2,921.95	132.54	2,895.94	131.36	2,094.75	95.02
Copper (LME)	6,523.04	295.88	6,165.97	279.68	4,862.59	220.56
Lead (LME)	2,242.43	101.71	2,317.46	105.12	1,871.58	84.89

Average Market Prices of Precious Metals	For the Year Ended December 31,		
	2018	2017 (in US\$/oz.)	2016
Silver (LBMA)	15.71	17.05	17.14
Gold (Fix)	1,268.49	1,257.15	1,250.80

The key drivers and recent trends of each of the metals that we produce are discussed below.

Zinc

Zinc is a major material for the construction and transport industries, which represent approximately 50.0% and 21.0% of the zinc end-use, respectively, according to Wood Mackenzie. These industries mainly use zinc for

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galvanizing steel and die casting, which account for approximately 59.0% and 13.0% of zinc applications, according to Wood Mackenzie.

The annual average price of zinc on the LME as of December 31, 2018, was flat compared to the corresponding period in 2017, increasing only 0.9%. At the start of 2018, zinc inventories reached record low levels, driving prices up to US\$3,618/tonne on February 16, 2018, the highest price in 10 years. However, due to intensified trade disputes between the United States and China later in the year, prices started to decrease, resulting in a relatively stable average price compared to 2017, even though market fundamentals, including low inventory levels, remained strong throughout the year.

Spot treatment charges for imported concentrates in China increased from US\$23.0 per tonne in January 2018 to US\$187.0 per tonne in December 2018, as reported by Wood Mackenzie, while long-term treatment charges decreased from US\$172.0 per tonne in 2017 to US\$147.0 per tonne in 2018, as reported by Wood Mackenzie.

The zinc metal market closed 2018 with a deficit of 1.1 thousand tonnes resulting from a metal production of 13.2 thousand tonnes (2.5% lower than 2017) and consumption of 14.3 thousand tonnes (0.6% higher than 2017). The inventories at the end of 2018 reported by Wood Mackenzie represented 39 days of consumption.

Zinc supply decreased mainly due to new environmental regulations in China that forced the closure of facilities with significant producing capacity, including the closure of the Zhuzhou smelter, which produced 450.0 thousand tonnes per year. China also contributed to an increase in demand, which was 82.0 thousand tonnes higher compared to 2017.

Copper

Copper is used for building construction, power generation and transmission, electronic product manufacturing and the production of industrial machinery and transportation vehicles. The annual average price of copper on the LME as of December 31, 2018 was 5.8% higher than in the corresponding period in 2017. Copper prices behaved similarly to zinc prices in 2018. Fundamentals for the market remained strong during 2018, but the uncertainty due to trade disputes between the United States and China resulted in declining prices in the second half of the year compared to the beginning of the year (an average of US\$6,916/tonne in the first half of 2018 compared to an average of US\$6,139/tonne in the second half of 2018).

In December 2018, copper stocks in the LME decreased by 34.0%, to 128.0 thousand tonnes, compared to 201.0 thousand tonnes in December 2017. Total mine production increased by 2.8% in 2018 and global demand for refined copper increased by 3.0% in 2018, according to Wood Mackenzie.

Lead

Lead is used in batteries as energy storage and in other products such as ammunition, oxides in glass and ceramics, casting metals and sheet lead. The annual average price of lead on the LME as of December 31, 2018 was 3.2% lower than in the corresponding period in 2017. This decrease was also due to uncertainty caused by trade disputes between the United States and China. Mining production was 1.2% lower in 2018 compared to 2017, according to Wood Mackenzie.

Silver

Silver is considered a precious metal and generally seen as a store of value, so its price tends to be resilient in times of economic uncertainty. In addition, applications in electronics and solar cells have added to the already broad range of uses of silver in currency, jewelry and silverware. The annual average London Bullion Market Association (or LBMA) silver price for the year ended December 31, 2018 was 7.9% lower than in the corresponding period in 2017, mainly due to a slowdown in demand, particularly in the beginning of the second half of 2018. The slowdown was mainly caused by concerns over ongoing trade disputes between the United States and China and its impact on the global economy, contributing to uncertainty in the markets. During the year, prices decreased by 9.4%, from US\$17.1 per ounce on January 2, 2018, the first day of trading, to US\$15.5 per ounce on December 31, 2018, the last day of trading.

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Production volumes, ore grade and metal mix

Our production volumes, the ore grade from our mines and the mix of metals in our product portfolio affect our business performance. The following table sets forth, for the periods indicated, our production, measured in terms of metal content in our zinc, copper and lead concentrates and the average ore grade of our production. For more details, see “Information on the Company—Mining operations.”

	For the Year Ended December 31,		
	2018	2017	2016
Concentrate Production			
Zinc concentrates (in tonnes)	794,519	791,583	860,400
Copper concentrates (in tonnes)	148,987	169,582	158,503
Lead concentrates (in tonnes)	96,093	96,006	104,409
Metal Contained in Concentrate Production			
Zinc contained in concentrates (in tonnes)	372,793	375,402	416,869
Copper contained in concentrates (in tonnes)	39,029	44,161	41,551
Lead contained in concentrates (in tonnes)	52,267	52,572	59,181
Silver contained in concentrates (in oz.)	7,992,167	7,945,778	8,539,568
Average Ore Grade			
Zinc (%)	3.27	3.30	3.47
Copper (%)	0.38	0.42	0.40
Lead (%)	0.53	0.53	0.57
Silver (grams per tonne)	28.45	27.99	29.24

Our zinc contained in concentrates production was stable in 2018. Our copper contained in concentrates production decreased by 12.1% in 2018, mainly due to a reduction in the feed materials sourced from the Cerro Lindo mine, despite copper contents remaining in line with past years. The reduction in feed materials was caused by delays in Cerro Lindo’s development plan, which resulted in difficulty accessing new areas of the ore bodies. Our lead contained in concentrates production was stable in 2018. Production of silver contained in concentrates was also stable in 2018.

The following table summarizes zinc contained in concentrate production and zinc equivalents production in each of our operations.

	Zinc Contained in Concentrate Production for the Year Ended December 31,			Zinc Equivalents Contained in Concentrate Production for the Year Ended December 31,		
	2018	2017	2016	2018	2017	2016
	(in tonnes of zinc contained in concentrates)			(in tonnes)		
Peru						
Cerro Lindo	130,349	155,950	173,808	245,492	283,208	296,007
El Porvenir	57,872	46,154	62,534	89,722	76,590	97,570
Atacocha	17,324	16,950	22,330	45,293	48,591	54,770
Brazil						
Vazante	140,842	135,379	135,509	143,792	138,395	137,535
Morro Agudo	26,408	20,969	22,688	31,386	25,614	29,197
Total Zinc	372,793	375,402	416,869	555,685	572,398	615,079

Commercial terms

We sell our concentrates and metallic zinc and zinc oxide products mostly through supply contracts with terms between one and four years, and only a small portion is sold on the spot market. The agreements with our

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customers include customary international commercial terms, such as cost, insurance and freight, or CIF; free on board, or FOB; free carrier, or FCA; and cost and freight, or CFR; pursuant to Incoterms 2010, as published by the International Chamber of Commerce. For concentrates, revenues are recorded at provisional prices and, typically, an adjustment is then made after delivery, based on the pricing terms provided for under the relevant contract.

Sales prices for our products are based on LME and/or LBMA quotations. Concentrates are typically sold at the LME price reference minus a discount (treatment charge for zinc and lead; treatment charge and refining charge for copper). Metallic zinc and zinc oxide are typically sold at the LME quotation averaged during a quotation period, such as the month after shipment, the month prior to shipment or another agreed period, plus a negotiable premium that varies based on quality, shape, origin, delivery terms and also according to the market where metal will be sold. In 2018, 58.0% of the total zinc concentrate consumption in our smelters was produced by our mines and 42.0% was purchased from third parties. We buy zinc concentrates from different suppliers in the market to meet our raw material requirements. We sell the balance of our zinc concentrates production and all our copper and lead concentrates production to metal producers and international traders, on international market terms.

Our sales of metallic zinc are highly diversified. Our customer base is composed mainly of end users. Our products reach the following end use industries: transport, construction, infrastructure, consumer goods and industrial machinery. In 2018, 79.1% of our total sales were to customers in the continuous galvanizing, general galvanizing, die casting, transformers and alloy segments and 20.1% were to international traders. Our ten largest customers represented approximately 51.4% of our total sales volume in 2018. In 2018, we sold to more than 328 customers across 42 different countries.

Free zinc, treatment charges, premiums and smelter by-products

Smelters are processing businesses that achieve a margin on the concentrates and other feedstocks they process; in large part, the price for the underlying metal is effectively passed through from the miner supplying the concentrate, or the supplier of the secondary feed material, to the smelter's customer. Our smelters use zinc concentrate as feedstock, which is supplied from our mines and from third-party suppliers. The smelter earns revenue from (i) the treatment charge reflected as a discount in the purchase price it pays, (ii) the refined metal it can produce and sell over and above the metal content it has paid for in concentrates purchased from the miner (free metal) and (iii) any premium it can earn on the refined products it sells to its customers. By-products can also contribute to a smelter's revenue. By-products from our smelting operations include silver, gold, copper, cement, sulfuric acid, lead concentrate, lead-silver concentrate, agricultural lime and copper sulfate.

Free zinc and treatment charges

Free zinc is the difference between the amount of zinc that is paid for in the concentrates and the total zinc recovered for sale by the smelter. The value of the zinc that is paid for corresponds to 85.0% of zinc content, which has historically been the industry standard, multiplied by the LME price of zinc. The zinc content which is not paid for is considered "free zinc." The margin of a zinc smelter improves as the amount of metal in zinc concentrates that it can recover increases.

The treatment charge (or TC) is a discount per tonne of concentrates, which is determined by negotiation between seller (a mine or a trading company) and the buyer (a smelter). Treatment charges can be benchmark (negotiated by the major miners and buyers, or Benchmark TC), spot or negotiated, and are also linked to the LME price of zinc by a parametric formula that increases the treatment charge when the LME price rises or decreases the treatment charge if the LME price falls.

We apply a Benchmark TC for our integrated mining and smelter operations in Peru. For our other purchases of zinc concentrate from third-party miners and trading companies, the treatment charge is based on the Benchmark TC, spot treatment charges or treatment charges negotiated annually with miners or trading companies.

The market trend for treatment charges reflects the supply and demand for concentrates in the market. Treatment charges tend to fall when demand increases relative to supply, and they tend to rise when demand falls. For information regarding our actual treatment charges, see "Information on the Company—Smelting operations."

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The following table sets forth, for the periods indicated, the zinc realized Benchmark TC, expressed in dollars per dry metric tonne (or dmt) of concentrate.

	For the Year Ended December 31,		
	2018	2017	2016
Treatment Charge (in US\$/dmt)	147	172	211

Source: Wood Mackenzie.

Premiums

Like other smelters, we sell metallic zinc and zinc oxide products at a premium over the base LME price. The premium reflects a combination of factors, including the service provided by the smelter in delivering zinc or lead of a certain size, shape or quality specified by its customers and transportation costs, as well as the conditions of supply and demand prevailing in the regional or local market where the metal is sold.

Premiums tend to vary from region to region, as transportation costs and the value attributable to customer specifications tend to be influenced by regional or local customs rather than being a function of global market dynamics.

The following table sets forth, for the periods indicated, information on premiums for the markets indicated, expressed in U.S. dollars per tonne.

	For the Year Ended December 31,		
	2018	2017	2016
Rotterdam (in US\$/tonne)	125	135	131
Singapore (in US\$/tonne)	131	137	130
United States (in US\$/tonne)	187	180	144

Source: Wood Mackenzie.

The following table sets forth, for the periods indicated, the gross premium over the base LME price for zinc oxide realized by our smelting operations in Brazil, expressed in dollars per tonne.

	For the Year Ended December 31,		
	2018	2017	2016
Brazilian operations (in US\$/tonne)	494	482	484

Smelter by-products

The quantity of by-products produced in our smelters depends on several factors, including the chemical composition of the concentrate and the recovery rates achieved. Concentrates from some mines contain higher levels of by-product metals than concentrates from other mines. In addition, the higher rate of by-product recovery, increase the number of by-products that can be produced and sold.

Sulfuric acid is the principal by-product we sell. It is manufactured from the sulfur dioxide gas generated from roasting zinc concentrates. While the zinc smelters use sulfuric acid in their leach plants, almost all this requirement is generated in each zinc smelter's electrolysis plant, and only small amounts of the sulfuric acid produced are used in its facilities, leaving the rest available for sale. We generally sell sulfuric acid under annual or multi-year contracts.

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The following table sets forth, for the periods indicated, the volume of our production and sales of sulfuric acid and the net revenues.

	For the Year Ended December 31,		
	2018	2017	2016
Sulfuric acid			
Production (in tonnes)	740,650	725,957	787,657
Sales (in tonnes)	558,912	570,228	632,242
Net Revenues (in thousands of US\$)	22,140	6,810	21,574

The following table sets forth, for the periods indicated, our sales and net revenues of silver concentrates.

	For the Year Ended December 31,		
	2018	2017	2016
Silver concentrates			
Sales (in tonnes)	6,459	5,332	6,096
Net Revenues (in thousands of US\$)	23,703	22,871	27,374

Operating costs and expenses

Our ability to manage our operating costs and expenses is a significant driver of our business performance. We focus on controlling and limiting our costs and expenses so that we are better prepared to overcome less favorable pricing conditions.

Energy costs

Our total cost of energy is composed of the operating costs of our own hydroelectric power plants, long-term electricity supply contracts, transmission and distribution charges and fees.

In Peru, the energy market is more stable in terms of generation (hydrology forecast) and prices. We obtain 3.2% of the electricity for our operations from our own hydroelectric power plants and 96.8% from third parties with contracts with terms ranging from one to two years.

In Brazil, the electricity for our operations comes from five hydroelectric plants in which our subsidiary Polarix has directly or indirectly the following interests as of December 31, 2018: a 21.0% participation in the consortium Enercan (Campos Novos hydroelectric power plant), 100.0% ownership of a hydroelectric power plant (Picada) located in Minas Gerais, a 12.6% participation in the consortium Amador Aguiar I, a 12.6% participation in the consortium Amador Aguiar II and a 23.9% participation in the consortium Igarapava. We account for the consortiums as joint operations, as discussed in Note 2 to our consolidated financial statements. On a consolidated basis, our costs for electricity in Brazil reflect the operating costs of the hydroelectric facilities and are not sensitive to market prices.

The current structure of our Brazilian energy assets, as described above, reflects transactions with our controlling shareholder concluded during 2017. Prior to those transactions, we owned the same energy assets through April 2016, except for Enercan, which was owned by a subsidiary of our shareholder VSA that sold us power under power purchase agreements. In our consolidated financial statements, we give retroactive effect to these transactions. See Note 2 to our consolidated financial statements.

The only activity of Polarix is to own our energy assets, and it sells energy to our Brazilian operating subsidiaries at market prices. We own all the common shares of Polarix, which represents 33.33% of its total share capital and/or its affiliates. The remaining shares are preferred shares with limited voting rights, which are owned by our shareholder VSA. Under the terms of the preferred shares, VSA is entitled to dividends per share equal to 1.25 times the dividends per share payable on the common shares. See “Information on the Company—Other operations—Power and energy supply.” As a result, in future periods we expect that a substantial part of the profits

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recognized by Pollarix from selling energy to our Brazilian operating subsidiaries will represent non-controlling interest in our income statement.

Environmental expenses

Our mines and smelters operate under licenses issued by governmental authorities that control, among other things, air emissions and water discharges and are subject to stringent laws and regulations relating to waste materials and various other environmental matters. Additionally, each operation, when it ultimately ceases operations permanently, will need to be rehabilitated.

We have made significant investments to reduce our environmental impact in the areas in which we operate and to ensure that we are able to comply with environmental standards. All our operational units have environmental improvement initiatives relating to reducing emissions and waste and improving the efficiency of use of natural resources and energy.

Where appropriate, we establish environmental provisions for restoration or remediation of existing contamination and disturbance, with all material issues being reviewed annually. Provisions associated with smelter and mining operations sites primarily relate to soil and groundwater contamination.

Since 2016, we have conducted an extensive study and update of our decommissioning plans, including potential environmental obligations. During this period, we also modified our internal policies for decommissioning and environmental issues, which require frequent updates of environmental studies to reflect the best international practices. As a result of these adjustments, we recorded an additional environmental provision of US\$68.6 million, US\$20.8 million and US\$18.3 million in 2016, 2017 and 2018, respectively. Although we do not expect significant provisions in the near future, changes in legislation and adjustments to our internal policies after the ongoing evaluations could require additional resources.

Macroeconomic conditions of the countries and regions where we operate

Peru

The following table sets forth Peruvian inflation rates, interest rates and exchange rates for the dates and periods indicated.

	As of and for the Year Ended December 31,		
	2018	2017	2016
GDP growth rate	4.0%	2.5%	4.0%
Internal demand growth rate	4.3%	1.4%	1.1%
Private investment growth rate	4.4%	0.2%	(5.4)%
Reference interest rate	2.8%	3.3%	4.3%
CPI Index	2.2%	1.4%	3.2%
Appreciation (devaluation) of <i>sol</i> against the U.S. dollar ⁽¹⁾	(4.0)%	3.5%	1.7%
Exchange rate of <i>sol</i> to US\$1.00 ⁽¹⁾	3.3755	3.2405	3.3560

Sources: Central Reserve Bank of Perú, Ministerio de Economía y Finanzas del Perú.

(1) As of the last day of the relevant period.

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Brazil

The following table sets forth Brazilian inflation rates, interest rates and exchange rates for the dates and periods indicated.

	As of and for the Year Ended December 31,		
	2018	2017	2016
GDP growth rate	1.1%	1.0%	(2.5)%
Inflation rate (IGP-M) ⁽¹⁾	7.5%	(0.5)%	7.2%
Inflation rate (IPCA) ⁽²⁾	3.8%	3.0%	6.3%
CDI rate ⁽³⁾	6.4%	6.9%	13.6%
SELIC rate ⁽⁴⁾	6.5%	7.0%	13.8%
TJLP ⁽⁵⁾	7.0%	7.0%	7.5%
Appreciation (devaluation) of <i>real</i> against the U.S. dollar ⁽⁴⁾	(14.6)%	(1.5)%	19.8%
Exchange rate of <i>real</i> to US\$1.00 ⁽⁴⁾	3.8748	3.3080	3.2591

Sources: IBGE, the Central Bank, CETIP and FGV.

(1) Accumulated during each period.

(2) Accumulated during each period.

(3) Accumulated during each period.

(4) As of the last day of the relevant period.

(5) As of the end of each period.

Effects of exchange rate fluctuations

Prices for our products are based on international indices, such as LME prices, and denominated in U.S. dollars. A portion of our production costs, however, is denominated in *reais*, so there is a mismatch of currencies between our revenue and costs. In 2018, 15.6% of our production costs and operational expenses were denominated in *reais*. A smaller portion of our costs is denominated in *soles* since most of our costs in Peru are in U.S. dollars. In 2018, 16.5% of our production costs and operational expenses were denominated in *soles*. As a result, our results of operations and financial position are affected by changes in exchange rates between *reais* and, to a lesser extent, *soles*, and the U.S. dollar.

In addition, our Brazilian subsidiary Nexa Brazil has substantial intercompany debt to Nexa Resources that is denominated in U.S. dollars. The functional currency of Nexa Brazil is the *real*, so Nexa Brazil recognizes exchange gain or loss when the value of the *real* rises or falls against the U.S. dollar. These gains and losses are not eliminated in consolidation because the functional currency of Nexa Resources is the U.S. dollar, so they do not recognize offsetting gain or loss. As of December 31, 2018, the aggregate amount outstanding under these intercompany loans was US\$515.0 million.

Peru

The following table sets forth for the periods indicated (i) the high and low exchange rates, (ii) the average of the exchange rates on the last day of each month for each year and daily for each month and (iii) the exchange rate at the end of each period, expressed in *soles* per U.S. dollar (*sol/US\$*), as reported by the Peruvian Central Bank.

	Exchange Rates of S/ per US\$1.00			
	Period-End	Average ⁽¹⁾	High	Low
Year ended December 31,				
2016	3.3551	3.3751	3.5367	3.2475
2017	3.2405	3.2613	3.3909	3.2310
2018	3.3755	3.2865	3.3850	3.2067
Month				
January 2019	3.3308	3.3438	3.3703	3.3169
February 2019	3.3034	3.3216	3.3414	3.3034
March 2019 (through March 25)	3.3033	3.3028	3.3140	3.2903

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Overview

Source: Central Reserve Bank of Peru, official offer exchange rates.

- (1) Annually, represents the average of the exchange rates on the last day of each month during the periods presented; monthly, represents the average of the end-of-day exchange rates during the periods presented.

As of March 25, 2019, the exchange rate was S/3.3033 per US\$1.00.

Brazil

The following table sets forth, for the periods indicated, (i) the high and low exchange rates, (ii) the average of the exchange rates on the last day of each month for each year and daily for each month and (iii) the exchange rate at the end of each period, expressed in *reais* per U.S. dollar (*real/US\$*), as reported by the Brazilian Central Bank.

	Exchange Rates of R\$ per US\$1.00			
	Period-End	Average(1)	High	Low
Year ended December 31,				
2016	3.2591	3.4833	4.1558	3.1193
2017	3.3080	3.1925	3.3807	3.0510
2018	3.8748	3.6558	4.1879	3.1391
Month				
January 2019	3.6519	3.7417	3.8595	3.6519
February 2019	3.7385	3.7236	3.7756	3.6694
March 2019 (through March 25)	3.8770	3.8277	3.8815	3.7762

Source: Brazilian Central Bank.

- (1) Annually, represents the average of the exchange rates on the last day of each month during the periods presented; monthly, represents the average of the end-of-day exchange rates during the periods presented.

As of March 25, 2019, the exchange rate was R\$3.8770 per US\$1.00.

Income taxes

Income taxes in Luxembourg, Peru and Brazil have a significant impact on our results. Due to economic and political conditions, tax rates in various jurisdictions may be subject to significant changes. Our future effective tax rates could be affected by changes in the mix of earnings in countries with different statutory tax rates, changes in the valuation of deferred tax assets and liabilities and changes in tax laws or their interpretation.

Luxembourg

The combined applicable income tax rate (including an unemployment fund contribution) is 26.0% from 2018 onwards.

Brazil

Our Brazilian subsidiaries are subject to corporate income tax on their Brazilian and non-Brazilian income. In addition to corporate income tax, a social contribution tax is imposed on their worldwide income, and the combined applicable rate is 34.0%.

Peru

Our Peruvian subsidiaries are subject to Peruvian income tax on their worldwide income and are eligible for a potential credit for foreign taxes paid on income derived from foreign sources. The general income tax rate is 29.5% from 2017 onwards.

To promote investments in Peru, investors and Peruvian companies may enter into an agreement with the Peruvian government, a Legal Stability Agreement, to provide a stable legal and tax regime for a specified period. In

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Overview

March 2002, Nexa Peru entered into a guarantee and investment protection contract, or the stability agreement. Pursuant to the stability agreement, Nexa Peru can apply a special income tax rate of 20.0% from 2007 through 2021. The 29.5% income tax rate will become applicable to Nexa Peru in 2022. While Nexa Peru remains subject to the stability agreement, it is required to pay the special charge on mining, or GEM (*Gravamen Especial a la Minería*), at marginal rates that vary from 4.00% to 13.12% of operating income, depending on the operating margin.

Our Peruvian subsidiaries Nexa Resources El Porvenir S.A.C. and Nexa Resources Atacocha S.A.A. do not have stability agreements with the Peruvian government and are therefore subject to a special mining tax, or IEM (*Impuesto Especial a la Minería*), with marginal rates from 2.00% and 8.40% of operating income, depending on the company's operating margin. In addition, these companies are subject to a mining levy (*regalia minera*). In 2022, Nexa Peru will become subject to IEM and mining royalties tax once its tax stability agreement with the Peruvian government expires.

Dividends distributed to us by our Peruvian subsidiaries are subject to withholding tax, at a rate of 5.0% for profits earned beginning in 2017 and onwards.

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CRITICAL ACCOUNTING POLICIES AND ESTIMATES

The following discussion and analysis of our financial position and results of operations is based on our consolidated financial statements. The preparation of our consolidated financial statements requires us to make estimates and judgments that affect the reported amount of assets and liabilities, revenues and expenses and related disclosure of contingent assets and liabilities at the date of our consolidated financial statements. In the preparation of our consolidated financial statements, we believe that certain variables and assumptions derived from past experience and other factors were reasonable and relevant. These estimates and assumptions are periodically reviewed and adjustments are made to our consolidated financial statements, when appropriate. Each of the corresponding notes to our consolidated financial statements provides a detailed discussion of our significant accounting policies, as well as critical accounting estimates.

Critical accounting policies reflect significant estimates or judgments about matters that are both inherently uncertain and material to our financial position or results of operations. Below is a description of our critical accounting policies that require significant estimates and judgments.

Impairment of goodwill

We annually test whether goodwill has suffered any impairment, in accordance with the accounting policy stated in Note 14 to our consolidated financial statements. We assess the recovery of the carrying amount of goodwill of each cash generating unit or group of cash generating units based on its value in use or fair value less costs to sell, using a discounted cash flow model.

We also assess, at each reporting date, whether there is an indication that goodwill may be impaired. If any indication exists, such as volume and price reductions or unusual events that can affect the business, we estimate the recoverable amount of the cash generating unit or group of cash generating units.

The process of estimating the value in use and the fair value less costs to sell involves assumptions, judgment and projections of future cash flows. Our assumptions and estimates of future cash flow used for impairment testing of goodwill are subject to risk and uncertainties, particularly for markets—such as metals—subject to higher volatilities, which are outside our control. The calculations used for the impairment testing are based on discounted cash flow models as of September 30, 2018, market assumptions, such as LME prices, market interest rates and other available data regarding global demand. The discount factor applied to the discounted cash flow model is our pre-tax weighted average cost of capital for the applicable region, adjusted for country-specific risk factors. These calculations use cash flow projections before taxes on income, based on financial and operational budgets for a five-year period. After the five-year period, the projections are extended to the end of the mine life for our mines and indefinitely for our smelters. We do not use growth rates in cash flow projections of the terminal value for our smelters. No material changes occurred between September 30, 2018 and December 31, 2018.

Fair value of derivatives and other financial instruments

We determine the fair value of financial instruments not traded in an active market by using valuation techniques. We use judgment to select among a variety of methods and make assumptions that are mainly based on market conditions existing at the end of each reporting period.

The main financial instruments and the assumptions we make for their valuation are described below.

- We consider the nature, terms and maturity of cash and cash equivalents, financial investments, trade accounts receivable and other current assets. The carrying amount of these items are similar to their respective fair value.
- Financial liabilities are subject to typical market interest rates. The market value is based on the present value of expected future cash disbursement, at interest rates currently available for debt with similar maturities and terms. We also consider the Company's credit risk when assessing the fair value of financial liabilities.
- The fair value of derivative financial instruments that we use for hedging transactions is evaluated by

calculating their present value through yield curves at the closing dates. The curves and prices used in the calculation for each group of instruments are developed based on data from the Brazilian Securities, Commodities and Futures Exchange, Central Bank of Brazil, LME and Bloomberg, interpolated between the available maturities.

- Swap contracts: The present value of both the assets and liabilities is calculated through the discount of forecasted cash flows by the interest rate of the currency in which the swap is denominated. The difference between the present value of the assets and the liabilities generates its fair value.
- Forward contracts: The present value is estimated by discounting the notional amount multiplied by the difference between the future price in the reference date and contracted price. The future price is calculated using the convenience yield of the underlying asset. It is common to use Asian non-deliverable forwards for hedging non-ferrous metals positions. Asian contracts are derivatives in which the underlying asset price is the average price of certain assets over a range of days.
- Option contracts: The present value is estimated based on pricing methodologies such as the Black model, with assumptions that include the underlying asset price, strike price, volatility, time to maturity and interest rate. The underlying asset price is the monthly average of the relevant foreign exchange rate.

Asset retirement obligations

Provisions are made for asset retirement obligation, restoration and environmental costs when the liability arises due to the development or mineral production of an operating asset, based on the net present value of estimated closure costs. Our initial recognition and any subsequent revision of asset retirement obligations also considers assumptions such as interest rates, inflation and useful lives of the assets. The Company reviews these estimates on a quarterly basis. Management uses its judgment and previous experience to determine the potential scope of restoration work that is required for the asset, as well as any related costs associated with such work.

The cash flows are discounted to present value using a credit risk-adjusted rate that reflects current market assessments of the time value of money and the specific risks for the asset to be restored. The interest rate charges relating to the liability are recognized as an accretion expense in net financial results. Differences in the settlement amount of the liability are recognized in the income statement. For additional information, see Note 19 to our consolidated financial statements included herein.

Tax, civil, labor and environmental provision

We are party to ongoing labor, civil, tax and environmental lawsuits, which are pending at different court levels. We establish provisions for potentially unfavorable outcomes of litigation in progress and update them based on management evaluation, with support from the positions of external legal counsel. For additional information, see Note 19 to our consolidated financial statements included herein.

Income tax and other taxes

We are subject to income tax in all countries in which we operate. Significant judgment is required in determining the income tax provision. The ultimate tax determination is uncertain for many transactions and calculations. We also recognize liabilities for anticipated tax audit issues based on estimates of whether additional taxes will be due. Where the final tax outcome of these matters is different from the amounts that were initially recorded, such differences will impact the current and deferred tax assets and liabilities in the period in which such determination is made. For additional information, see Note 18 to our consolidated financial statements included herein.

Revenue recognition

We recognize revenue when a performance obligation is satisfied by transferring a promised good or service to a customer. The asset is transferred when the customer obtains control of such asset. In order to determine

the point in time at which a customer obtains control of a promised asset, we consider the following elements: (i) we have a present right to payment for the asset; (ii) the customer has legal title to the asset; (iii) we transferred physical possession of the asset; (iv) the customer has the significant risks and rewards of ownership of the asset; and (v) the customer has accepted the asset.

We also exercise a significant degree of judgement to determine the transaction price. The transaction price is the amount of consideration to which we expect to be entitled in exchange for transferring promised goods or services to our customers. Transaction price is allocated to each performance obligation on a relative standalone selling price basis. For additional information, see Note 22 to our consolidated financial statements included herein.

Determination of mineral reserves and inferred resources as basis to determine life of mine

Mineral reserves are deposits estimated to be economically feasible for extraction under economic conditions as of the applicable measurement date. The amortization method and rates applied to the rights to use natural resources reflect the pattern in which the benefits are expected to be used by us and based on the estimated life of mine. Any changes to the life of mine, including as a result of changes in estimates of mineral deposits and mining plans, may affect prospective amortization rates and carrying values of these assets. The process of estimation of mineral deposits is based on a technical evaluation, which includes accepted geological, geophysics, engineering, environmental, legal and economic estimates. These estimates, when evaluated in the aggregate, can have a relevant impact on the economic viability of the mineral deposits. We use various assumptions with respect to expected future conditions, such as metal prices, inflation rates, exchange rates, technology improvements and production costs, among others. Estimates of mineral reserves and resources are reviewed periodically, and any changes are adjusted to reflect life of mine and, consequently, adjustments to amortization periods. Costs for the acquisition of rights to explore and costs to develop mineral properties incurred as of the start of the feasibility study phase known as front end loading 3, or FEL 3, are capitalized. Since April 1, 2018, these costs are amortized using the units of production method over the estimated useful lives of the mines. The impacts of the change in the accounting estimation were not considered to be material, and the change was accounted for prospectively. Once the mine is operational, these costs are amortized and considered a production cost.

Recently issued accounting standards and interpretations not yet adopted

For a discussion of new standards, interpretations and amendments to IFRS, see Note 3 to our consolidated financial statements.

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RESULTS OF OPERATIONS

The following discussion and analysis of our financial position and results of operations is based on our consolidated financial statements. The following table sets forth our summarized results of operations for the periods indicated.

	For the Year Ended December 31,			Variation		% of Net Revenue from Products Sold		
	2018	2017	2016	2018/2017	2017/2016	2018	2017	2016
	(in millions of US\$)			(percentage)			(percentage)	
Consolidated income statement information:								
Net revenues	2,491.2	2,449.5	1,964.8	1.7	24.7	100.0	100.0	100.0
Cost of sales	(1,888.9)	(1,752.8)	(1,504.2)	7.8	16.5	(75.8)	(71.6)	(76.6)
Gross profit	602.3	696.7	460.6	(13.5)	51.3	24.2	28.4	23.4
Operating expenses:								
Selling	(18.7)	(17.6)	(25.5)	6.2	31.0	(0.8)	(0.7)	(1.3)
General and administrative	(140.9)	(136.9)	(118.7)	2.9	15.3	(5.7)	(5.6)	(6.0)
Mineral exploration and project development	(126.3)	(92.7)	(46.7)	36.2	98.5	(5.1)	(3.8)	(2.4)
Other income and expenses, net	18.2	(47.9)	(139.7)	(138.0)	(65.7)	0.7	(2.0)	(7.1)
Operating income	334.6	401.6	130.0	(16.7)	208.9	13.4	16.4	6.6
Financial income	67.5	29.9	25.0	125.8	19.6	2.7	1.2	1.3
Financial expenses	(121.7)	(106.2)	(70.4)	14.6	50.9	(4.9)	(4.3)	(3.6)
Foreign exchange (loss) gain, net	(148.5)	(53.9)	124.5	175.5	(143.3)	(6.0)	(2.2)	6.3
Net financial results	(202.7)	(130.2)	79.1	55.6	(264.6)	(8.1)	(5.3)	4.0
Share in the results of associates	—	0.1	(0.2)	(100.0)	(150.0)	—	—	—
Income before income tax	131.9	271.5	208.9	(51.4)	30.0	5.3	11.1	10.6
Current income tax	(71.8)	(125.7)	(75.3)	(42.9)	66.9	(2.9)	(5.1)	(3.8)
Deferred income tax	30.9	19.5	(23.1)	58.5	(184.4)	1.2	0.8	(1.2)
Net income for the year	91.0	165.3	110.5	(44.9)	49.6	3.7	6.7	5.6

Net revenues

In 2018, net revenues increased by 1.7%, or US\$41.7 million. This increase was primarily due to slightly higher metal prices combined with higher metal sales and offset by lower sales volumes of by-products. In 2017, net revenues increased by 24.7%, or US\$484.6 million. This increase was primarily due to the increase in base metal prices, particularly zinc, which more than offset an operational slowdown that resulted in 6.9% lower zinc equivalent production and 2.7% lower smelting sales compared to 2016.

In 2018, zinc and copper average LME prices increased by 0.9% and 5.8%, respectively, while lead average LME price decreased by 3.2%. The average LME price of zinc increased from US\$2,895.94 per tonne in 2017 to US\$2,921.95 per tonne in 2018. Although the slight increase reflects an upward trend throughout the year, market confidence and sentiment were negatively impacted by concerns about trade disputes between the United States and China. In 2017, zinc, copper and lead average LME prices increased by 38.2%, 26.8% and 23.8%,

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Results of Operations

respectively. In particular, the average LME price of zinc increased from US\$2,094.75 per tonne in 2016 to US\$2,895.94 per tonne in 2017. These increases were mainly a result of constraints in the global supply of zinc and lead, as well as an imbalance in supply and demand among copper mines and smelters and refineries.

The following table shows a breakdown of our net revenues by destination of our sales.

	For the Year Ended December 31,		
	2018	2017	2016
	(in millions of US\$)		
Brazil	693.4	721.6	560.9
Peru	674.2	696.5	573.9
Luxembourg	172.8	130.7	100.6
United States of America	141.1	158.1	156.6
Switzerland	126.2	108.8	59.9
Japan	93.5	69.6	36.0
Others	590.0	564.2	476.9
Net revenues	2,491.2	2,449.5	1,964.8

The following table sets forth the components of our production and sales volumes for the metals and periods indicated.

	For the Year Ended December 31,		
	2018	2017	2016
Mining Production			
Zinc concentrates (in tonnes)	794,519	791,583	860,400
Copper concentrates (in tonnes)	148,987	169,582	158,503
Lead concentrates (in tonnes)	96,093	96,006	104,409
Mining Production—Metal Contained in Concentrate			
Zinc contained in concentrates (in tonnes)	372,793	375,402	416,869
Copper contained in concentrates (in tonnes)	39,029	44,161	41,551
Lead contained in concentrates (in tonnes)	52,267	52,572	59,181
Silver contained in concentrates (in oz.)	7,992,167	7,945,778	8,539,568
Gold contained in concentrates (in oz.)	29,224	32,534	27,893
External Mining Sales⁽¹⁾			
Zinc concentrates (in tonnes)	15,036	8,863	88,976
Copper concentrates (in tonnes)	147,704	169,590	157,054
Lead concentrates (in tonnes)	89,831	94,486	103,017
External Mining Sales—Metal Contained in Concentrate⁽²⁾			
Zinc contained in concentrates (in tonnes)	7,533	4,459	49,004
Copper contained in concentrates (in tonnes)	38,932	44,165	41,186
Lead contained in concentrates (in tonnes)	48,453	50,631	58,538
Smelting Production—Zinc Contained in Product Volumes			
Cajamarquilla (metallic zinc in tonnes)	330,104	310,062	334,261
Três Marias (metallic zinc in tonnes)	186,711	185,829	186,708
Juiz de Fora (metallic zinc in tonnes)	90,583	87,322	86,616 ⁽⁴⁾
Total zinc product production (in tonnes)	607,398	583,073	607,585

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	For the Year Ended December 31,		
	2018	2017	2016
Zinc Oxide Production—Zinc Contained in Product Volumes			
Três Marias (contained zinc in tonnes)	30,813	30,827 ⁽³⁾	30,485 ⁽³⁾
Smelting Sales—Product Volumes			
Metallic zinc (in tonnes)	578,730	555,419	573,105
Zinc oxide (in tonnes)	38,152	38,472	37,386
Total smelting sales volumes (in tonnes)	616,882	593,891	610,491
Smelting Sales—Zinc Contained in Product Volumes⁽²⁾			
Metallic zinc (in tonnes)	576,918	553,720	571,319
Zinc oxide (in tonnes)	30,522	30,777	29,909
Total zinc contained in product volumes (in tonnes)	607,440	584,497	601,228

(1) Excluding intercompany sales.

(2) Based on typical zinc contents in metallic zinc products and zinc oxide. For more details, see “Information on the Company—Smelting operations—Zinc contained in smelting products sold.”

(3) Including 27,885 tonnes of zinc ashes and drosses in 2018, as well as metallic zinc used in the production of zinc oxide in 2018, 29,335 in 2017 and 27,621 in 2016.

(4) Including 2,236 tonnes of zinc ashes and drosses in 2018, 2,453 in 2017 and 2,190 in 2016.

Cost of sales

In 2018, our cost of sales increased by 7.8%, or US\$136.1 million, primarily due to higher costs related to improvements to safety standards at our mines and higher costs for concentrate purchased by our smelters in the first half of 2018.

In 2017, our cost of sales increased by 16.5%, or US\$248.6 million, primarily due to (i) higher concentrate prices, which impacted our smelting operations, (ii) safety-related processes implemented at our Peruvian mines and (iii) the depreciation of the U.S. dollar against the *real* and *sol*. The increase in concentrate prices represented 75.0% of the increase in cost of sales, mainly due to the exposure of concentrate prices to variations in zinc LME prices, as well as an increase in purchases of zinc concentrates from third parties, mainly related to operations in our Cajamarquilla smelter in 2017 as compared to 2016.

Selling expenses

In 2018, our selling expenses increased by 6.2%, or US\$1.1 million, mainly due to higher volume sold.

In 2017, our selling expenses decreased by 31.0%, or US\$7.9 million, mainly due to lower volume sold.

General and administrative expenses

In 2018, our general and administrative expenses increased by 2.9%, or US\$4.0 million, primarily due to incremental costs associated with being a public company following our 2017 initial public offering.

In 2017, our general and administrative expenses increased by 15.3%, or US\$18.2 million, mainly due to the full year impact of our corporate restructuring that resulted in the redistribution of personnel expenses in our zinc, nickel and aluminum divisions starting in July 2016. Therefore, overhead expenses that were previously allocated between these three business divisions were assumed solely by us.

Mineral exploration and project development

In 2018, our mineral exploration and project development expenses increased by 36.2%, or US\$33.6 million, primarily due to higher costs related to the development of greenfield and brownfield projects in the scoping study and pre-feasibility study stages.

In 2017, our mineral exploration and project development expenses increased by 98.5%, or US\$46.0 million, primarily due to the exploration and development of the Aripuanã greenfield project.

Other income and expenses, net

In 2018, our other income and expenses, net positively impacted our results by US\$66.1 million, primarily due to an October 2018 decision by regional federal court, which granted our subsidiary Nexa Brazil the right to recover US\$60.0 million in federal tax credits. Of that US\$60.0 million, approximately US\$34.0 million corresponds to principal and was recognized in Other operating expenses, net. The remaining US\$26.0 million corresponds to interest and was recognized as Financial income.

In 2017, our other income and expenses, net positively impacted our results by US\$91.8 million, primarily due to (i) our hiring of specialized consultants to review decommissioning plans of our Brazilian operational units in 2016, which resulted in a one-time US\$68.6 million provision for environmental obligations, (ii) a US\$15.6 million decrease in judicial provisions and (iii) a US\$14.7 million decrease in hedge losses.

The following table sets forth our other income and expenses, net for the periods indicated. See Note 25 to our consolidated financial statements.

	For the Year Ended December 31,		
	2018	2017	2016
	(in millions of US\$)		
Other income and expenses, net			
Environmental and asset retirement obligations	12.1	0.4	(68.6)
Mining obligations	(12.6)	(11.6)	(9.0)
Corporate projects	(13.4)	(12.9)	(7.7)
Commodities derivative financial instruments	17.6	(18.8)	(33.5)
Provision for tax, labor, civil, and environmental claims	(3.7)	0.3	(15.2)
Loss on sale of property, plant and equipment	(9.9)	(0.7)	(0.6)
Gain on sale of investment	0.3	4.6	0.4
Impairment of property, plant, equipment and intangibles	(3.3)	—	1.0
Tax credits	37.5	0.1	—
Other operating expenses, net	(6.4)	(9.3)	(6.5)
Total other income and expenses, net	18.2	(47.9)	(139.7)

Net financial results

We recognized a net financial loss of US\$202.7 million in 2018 compared to a net financial loss of US\$130.2 million in 2017, mainly due to higher non-cash foreign exchange losses, partially offset by the impact of US\$26.0 million in Brazilian federal tax credits on our financial income. We recognized a net financial loss of US\$130.2 million in 2017 compared to a net financial gain of US\$79.1 million in 2016, mainly due to the non-cash impact of exchange rate variation on U.S. dollar-denominated debt between Nexa Brazil and Nexa Resources.

Net foreign exchange gains (losses) reflect the accounting effect of the appreciation of the *real* against the U.S. dollar on certain U.S. dollar-denominated loans made by Nexa Resources to Nexa Brazil (which uses the *real* as its functional currency). During 2018, the 14.6% depreciation of the *real* against the U.S. dollar resulted in a foreign exchange loss. During 2017, the 1.5% depreciation of the *real* against the U.S. dollar resulted in a foreign exchange loss. During 2016, the 19.8% appreciation of the *real* against the U.S. dollar resulted in a foreign exchange gain.

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Results of Operations

In 2018, our financial income increased by 125.8%, or US\$37.6 million, to US\$67.5 million. The increase in 2018 was due to an increase in our investments and to the US\$26.0 million in Brazilian federal tax credits awarded to Nexa Brazil. In 2017, our financial income increased by 19.6%, or US\$4.9 million, to US\$29.9 million. The increase in 2017 was due to a 77.8% increase in gains of financial investments due to a higher amount of financial investments.

In 2018, our financial expenses increased by 14.6%, or US\$15.5 million, to US\$121.7 million due to higher interest expense on borrowings, including a US\$16.0 million increase in interest expense with respect to our 2017 bond offering. In 2017, our financial expenses increased by 50.9%, or US\$35.8 million, to US\$106.2 million due to an increase of 56.5%, or US\$20.4 million, in interest on borrowings and US\$8.2 million of interest on deferred revenue due to our silver streaming agreement with Triple Flag Mining Finance Bermuda Ltd.

Income before income tax

As a result of the factors described above, our income before income tax was US\$131.9 million in 2018, as compared to income before income tax of US\$271.5 million and US\$208.9 million, in 2017 and 2016, respectively.

Income tax

In 2018, we recorded an income tax expense of US\$40.9 million. In 2017, we recorded an income tax expense of US\$106.2 million compared to an income tax expense of US\$98.4 million in 2016.

In 2018, our current income tax expense decreased by 42.9%, or US\$53.9 million, to US\$71.8 million, mainly as a result of: (i) foreign exchange tax losses on the payment of intercompany debt between Nexa Brazil and Nexa Resources; (ii) the tax deduction of equity accounting from our subsidiaries; and (iii) a decrease in LME prices. In 2017, our current income tax expense increased by 66.9%, or US\$50.4 million, to US\$125.7 million, mainly as a result of: (i) income taxes paid in connection with our subsidiary VGmbH (currently in the process of liquidation) that are related to income tax from prior years and income tax advances; (ii) payment of withholding income tax in Luxembourg on dividends received from Peru; (iii) an increase in the Peruvian corporate income tax rate to 29.5%; and (iv) an increase in LME prices.

In 2018, we recorded a deferred income tax benefit of US\$30.9 million, mainly as a result of foreign exchange losses and the depreciation and amortization of fair value adjustment to property, plant, equipment and intangible assets. In 2017, we recorded a deferred income tax benefit of US\$19.5 million, mainly as a result of depreciation and amortization of fair value adjustment to property, plant, equipment and intangible assets. In 2018, we had a nominal tax rate and an effective tax rate of 26.0% and 31.0%, respectively. The difference between the nominal and effective tax rates in 2018 is primarily a result of differences in tax rates from subsidiaries outside Luxembourg and a temporary special mining levy in Peru. In 2017, we had a nominal tax rate and an effective tax rate of 27.1% and 39.1%, respectively. The difference between the nominal and effective tax rates in 2017 is primarily a result of differences in tax rates from subsidiaries outside Luxembourg and a special mining levy in Peru. For additional information, see Note 18 to our consolidated financial statements.

Net income

As a result of the foregoing, we recorded net income of US\$91.0 million in 2018 as compared to net income of US\$165.3 million in 2017 and net income of US\$110.5 million in 2016.

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Results by segment

The following table sets forth our summarized results of operations by segment for the periods indicated.

	For the Year Ended December 31,			Variation		Variation				
	2018	2017	2016 (in millions of US\$)	2018/ 2017	2017/ 2016	2018/ 2017	2017/ 2016 (percentage)			
Consolidated Income Statement										
Information:										
Net revenues:										
Mining	1,163.7	1,213.2	907.4	(49.5)	305.8	(4.1)%	33.7%			
Smelting	2,030.5	1,952.0	1,492.0	78.5	460.0	4.0%	30.8%			
Intersegments Sales	(704.0)	(721.4)	(438.2)	17.4	(283.2)	(2.4)%	64.6%			
Adjustments ⁽¹⁾	1.0	5.7	3.6	(4.7)	2.1	(82.5)%	58.3%			
Total	2,491.2	2,449.5	1,964.8	41.7	484.7	1.7%	24.7%			
Cost of sales:										
Mining	(694.0)	(680.8)	(608.8)	(13.2)	(72.0)	1.9%	11.8%			
Smelting	(1,876.0)	(1,746.8)	(1,307.4)	(129.2)	(439.4)	7.4%	33.6%			
Intersegments Sales	704.0	721.4	438.2	(17.4)	(283.2)	(2.4)%	64.6%			
Adjustments ⁽¹⁾	(22.9)	(46.7)	(26.2)	23.8	(20.5)	(51.0)%	78.2%			
Total	(1,888.9)	(1,752.9)	(1,504.2)	(136.0)	(248.7)	7.8%	16.5%			
Gross profit:										
Mining	469.7	532.4	298.6	(62.7)	233.8	(11.8)%	78.3%			
Smelting	154.5	205.2	184.6	(50.7)	20.6	(24.7)%	11.2%			
Adjustments ⁽¹⁾	(21.9)	(40.9)	(22.6)	19.0	(18.3)	(46.5)%	81.0%			
Total	602.3	696.7	460.6	(94.4)	236.1	(13.5)%	51.3%			

(1) See Note 1 to our consolidated financial statements.

Mining

Net revenues

In 2018, our net revenues in the mining segment decreased by 4.1%, or US\$49.5 million. This decrease was primarily due to lower zinc and copper sales volumes, which was partially offset by a slight increase in zinc and copper prices. In 2017, our net revenues in the mining segment increased by 33.7%, or US\$305.8 million, primarily due to an increase in LME prices for zinc, lead and copper, despite a 6.9% decrease in mining production, from 615.1 thousand tonnes of zinc equivalent production in 2016 to 572.4 thousand tonnes in 2017.

In 2018, our production of zinc contained in concentrates remained stable, primarily due to lower zinc grades partially offset by higher amount of treated ore. In 2017, our production of zinc contained in concentrates decreased by 9.9% in our mines, primarily due to (i) unusually severe rains in Peru in the first quarter of 2017, (ii) a lower amount of treated ore due to the implementation of updated safety procedures implemented at our underground mines in Peru and (iii) lower zinc grades.

In 2018, our sales volumes of copper contained in concentrates decreased by 11.8% to 38,932 thousand tonnes of metal contained in concentrates, primarily due to a 12.0% decrease in copper contained in concentrates production at Cerro Lindo. In 2017, our sales volumes of copper contained in concentrates increased by 7.2%, to 44.2 thousand tonnes of metal contained in concentrates, primarily due to higher copper grade at Cerro Lindo.

In 2018, our sales volumes of lead contained in concentrates decreased by 4.3% to 48.5 thousand tonnes of metal contained in concentrates, primarily as a result of a 14.0% decrease in lead contained in concentrates at Cerro Lindo. In 2017, our sales volumes of lead contained in concentrates decreased by 13.5%, to 50.6 thousand tonnes of metal contained in concentrates, primarily as a result of the same factors that drove the decrease in zinc contained in

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concentrates: (i) unusually severe rains in Peru in the first quarter of 2017, (ii) a lower amount of treated ore due to the implementation of updated safety procedures at our underground mines in Peru and (iii) lower lead grades.

In 2018, our external sales volumes of zinc contained in concentrates increased by 68.9% to 7.5 thousand tonnes of metal contained in concentrates, primarily reflecting the impact of unusually severe rains in 2017, which led to a decrease in our production and external sales volumes for that year. In 2017, our external sales volumes of zinc contained in concentrate decreased by 90.9%, to 4.5 thousand tonnes of metal contained in concentrates, primarily due to increased use zinc contained in concentrates within our own smelters.

Cost of sales

In 2018, our cost of sales in our mining segment increased by 1.9%, or US\$13.2 million, mainly due to costs relating to efforts to improve safety conditions in our mines. In 2017, our cost of sales in our mining segment increased by 11.8%, or US\$72.0 million, mainly due to the implementation of updated safety procedures in our mines and the depreciation of the U.S. dollar against the *real* and *sol*. The average exchange rate of *reais* to U.S. dollars increased 14.5%, from 3.19 *reais* per U.S. dollar in 2017 to 3.66 *reais* per U.S. dollar in 2018. The average exchange rate of *soles* to U.S. dollars increased 0.8%, from 3.26 *soles* per U.S. dollar in 2017 to 3.29 *soles* per U.S. dollar in 2018.

Smelting

Net revenues

In 2018, our net revenues in the smelting segment increased 4.0%, or US\$78.5 million, mainly due to higher sales volumes in our Cajamarquilla and Três Marias smelters. In 2017, our net revenues in the smelting segment increased 30.8%, or US\$460.0 million, mainly due to an increase in zinc prices.

In 2018, our sales volumes of metallic zinc (mainly SHG, CGG and alloys produced in our smelting facilities) increased by 4.2% to 578.8 thousand tonnes, mainly due to higher production. In 2017, our sales volumes of metallic zinc decreased by 3.1%, to 555.4 thousand tonnes. This decrease was mainly due to unusually severe rains in Peru during the first quarter of 2017.

In 2018, our sales volumes of zinc oxide decreased by 0.8% to 38.2 thousand tonnes. In 2017, our sales volumes of zinc oxide increased by 2.9%, to 38.5 thousand tonnes.

Cost of sales

In 2018, our cost of sales in our smelting segment increased by 7.4%, or US\$129.2 million, primarily due to higher metal sales volume and slightly higher zinc prices. In 2017, our cost of sales in our smelting segment increased by 33.6%, or US\$439.4 million, primarily due to an increase in zinc prices and a decrease in treatment charges.

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LIQUIDITY AND CAPITAL RESOURCES

Overview

In the ordinary course of business, our principal funding requirements are for working capital requirements, capital expenditures relating to maintenance and expansion investments, servicing our indebtedness and distributions to our shareholders. We typically meet these requirements through operational cash flow, long-term borrowings from private banks, the Brazilian Economic and Social Development Bank (*Banco Nacional de Desenvolvimento Econômico e Social*), or BNDES, international export credit agencies, and the issuance of debt securities in the international capital markets.

For 2019, we have budgeted capital expenditures of US\$420.0 million, including: (i) US\$140.0 million for construction of the Aripuanã greenfield project; (ii) US\$24.0 million for the life of mine extension at Vazante; and (iii) US\$24.0 million for the conversion from the Goethite conversion process to the Jarosite conversion process at our Cajamarquilla smelter. US\$32.5 million of our debt matures in 2019. During 2018, we paid US\$80 million in distributions to shareholders and repurchased US\$1.4 million of our common shares.

Our financing strategy is to fund our necessary capital expenditures and to preserve our liquidity while meeting our debt payment obligations. We believe that our cash and cash equivalents on hand, cash from operations and available borrowings will be adequate to meet our capital expenditure requirements and liquidity needs for our current requirements. We may require additional capital to meet our longer-term liquidity and future growth requirements. Although we believe that our sources of liquidity are adequate, weaker economic conditions in Brazil, Peru or globally could materially adversely affect our business and liquidity.

Sources of funds

Our principal sources of funds are cash flows from operations, long-term borrowings from banks and the BNDES and issuance of debt securities in the international capital markets. The availability of cash flows from operations is affected by our working capital requirements, share premium reimbursements, dividends and investment activities, as well as a need to service our indebtedness. In 2018, our operating activities generated cash flows of US\$347.6 million, compared to US\$378.9 million in 2017, primarily due to an increase in our adjusted working capital, offset by a decline in gross profits.

Uses of funds

During 2018, we used cash flow generated by our operations primarily for capital expenditures requirements, share premium reimbursements and a final payment related to the 2017 transaction regarding our Brazilian energy assets. At December 31, 2018, our consolidated cash, cash equivalents and financial investments totaled US\$1,125.1 million, and our consolidated adjusted working capital totaled US\$109.0 million.

Cash flows

The table below sets forth our cash flows from operating activities, investing activities and financing activities for the years ended December 31, 2018 and 2017.

	For the Year Ended December 31,			Variation 2018/2017 (percentage)	
	2018	2017	2018/2017 (in millions of US\$)		
Consolidated Statement of Cash Flows Information					
Net cash flows provided by (used in):					
Operating activities	347.6	378.9	(31.3)	(8.3)	
Investing activities	(158.1)	(328.4)	170.3	(51.9)	
Financing activities	(177.4)	52.9	(230.2)	(435.3)	

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Liquidity and Capital Resources

	For the Year Ended December 31,			Variation 2018/2017 (percentage)
	2018	2017 (in millions of US\$)	2018/2017	
Effects of exchange rates on cash and cash equivalents	1.8	0.1	1.7	1700
Increase (decrease) in cash and cash equivalents	13.9	103.5	(89.5)	(86.6)
Cash and cash equivalents at the beginning of the year	1,019.0	915.6	103.4	11.3
Cash and cash equivalents at the end of the year	1,032.9	1,019.0	13.9	1.4

In 2018, our net cash flow provided by operating activities decreased by 8.3%, or US\$31.3 million, primarily due to an increase in our adjusted working capital, offset by a decline in gross profits.

At December 31, 2018, our adjusted working capital was US\$109.0 million. At December 31, 2017, our adjusted working capital was US\$85.3 million. This difference was mainly due to an increase in other taxes recoverable and a decrease in confirming payable and taxes payable.

In 2018, our net cash flow used in investing activities increased by 51.9%, or US\$170.3 million, to US\$158.1 million, mainly due to (i) an increase in investments in property, plant and equipment, (ii) an increase in our financial investments, and (iii) a final payment related to the 2017 transaction regarding our Brazilian energy assets.

In 2018, our net cash flow used in financing activities decreased by US\$230.3 million, to US\$177.4 million, primarily due to (i) a capital reduction related to the Brazilian energy assets transaction, and (ii) our March 2018 distribution of share premium reimbursements to our shareholders.

At December 31, 2018, our cash and cash equivalents was US\$1,032.9 million, which is stable compared to our cash and cash equivalents at December 31, 2017.

Capital expenditures

Our capital expenditures in 2018 totaled US\$299.7 million, mainly due to the following projects: the Vazante life of mine extension, the implementation of dry stacking tailing at Vazante, the start of construction at Aripuanã and the change from a Goethite conversion process to a Jarosite conversion process at Cajamarquilla.

For 2019, our estimated capital expenditures total US\$420.0 million to invest in projects that are currently underway. Our main projects include: (i) US\$140.0 million for construction of the Aripuanã greenfield project; (ii) US\$24.0 million for the life of mine extension at Vazante; and (iii) US\$24.0 million for the change from the Goethite to the Jarosite conversion process at the Cajamarquilla smelter.

Expenses related to project development and exploration

We expect our expenses to increase in 2019 as we continue to advance our exploration and drilling campaigns and develop our pipeline of projects. This increase impacts our margins because early-stage projects are accounted for as other expenses. In 2019, we expect to spend US\$128.0 million on expenses for early-stage projects, including US\$75.0 million for mineral exploration and US\$53.0 million for project development.

Distributions and repurchases

During 2018, we made distributions to our shareholders through share premium reimbursements. The share premium is a reserve account of the net equity of a Luxembourg company and can be distributed to the shareholders. On February 15, 2018, the board of directors approved the distribution of a US\$80.0 million share premium reimbursement, corresponding to US\$0.60 per share paid to the shareholders on March 28, 2018.

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Liquidity and Capital Resources

On February 15, 2019, the board of directors approved a cash dividend of up to US\$70.0 million, corresponding to US\$0.53 per share paid to the shareholders on March 28, 2019.

Any future payment of dividends or other distributions pursuant to our dividend policy will be subject to the approval of our board of directors or our shareholders, as applicable, based on a number of factors, including but not limited to, our cash balance, cash flow, earnings, capital investment plans, other potential cash disbursements, expected future cash flows from operations and strategic plans, as well as legal requirements and other factors we may deem relevant at the time. See “Share ownership and trading—Distributions.”

We repurchased US\$1.35 million of our common shares during 2018, excluding fees. For more information, see “Share ownership and trading—Purchases of equity securities by the issuer and affiliated purchasers.”

Debt

As of December 31, 2018, our total outstanding consolidated indebtedness (current and non-current loans and financings, including accrued interest as of December 31, 2018) is US\$1,424.9 million, consisting of US\$32.5 million of short-term indebtedness, including the current portion of long-term indebtedness (or 2% of the total indebtedness), and US\$1,392.5 million of long-term indebtedness (or 98% of the total indebtedness). As of December 31, 2018, none of our outstanding consolidated indebtedness was guaranteed by sureties.

Our U.S.-dollar denominated indebtedness as of December 31, 2018 was US\$1,301.4 million (or 91.3% of our total indebtedness) and our Brazilian *real*-denominated indebtedness was US\$123.5 million (or 8.7% of our total indebtedness).

As of December 31, 2018, US\$381.1 million, or 26.7% of our total consolidated indebtedness, bears interest at floating rates, including US\$94.1 million of *real*-denominated indebtedness that bore interest at rates based on the SELIC rate or TJLP (*Taxa de Juros de Longo Prazo*) and TLP (*Taxa de Longo Prazo*) rates (the long-term interest rates set by the Brazilian National Monetary Council and the basic costs of financing of the BNDES), and US\$255.3 million of foreign currency-denominated indebtedness that bore interest at rates based on LIBOR or the BNDES Monetary Unit (*Unidade Monetária BNDES*), or UMBNDES, rate.

The following table sets forth selected information with respect to our total outstanding consolidated indebtedness as of December 31, 2018.

Indebtedness	Average Annual Interest Rate	As of December 31, 2018		
		Current Portion(1)	Long-term Portion (in millions of US\$)	Total
Eurobonds	Fixed plus 5.13%	9.9	1,032.7	1,042.6
Debt with banks	LIBOR plus 1.27%	0.7	196.5	197.3
BNDES	TJLP plus 2.82% / SELIC plus 3.10% / TLP plus 5.23%	6.1	83.8	89.9
Debentures	110.5% CDI	7.4	20.8	28.2
Other		8.3	58.6	66.9
Total		32.5	1,392.4	1,424.9

(1) Includes principal and interest.

As of December 31, 2018, US\$83.3 million remains outstanding under our loan agreements with BNDES, with Nexa Brazil as borrower and Nexa Resources as guarantor.

Many of our debt instruments also contain other covenants that restrict, among other things, our ability and the ability of certain of our subsidiaries to incur liens and merge or consolidate with any other person or sell or otherwise dispose of all or substantially all of its assets. These instruments also contained covenants requiring that we comply with certain financial ratios, including:

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Liquidity and Capital Resources

- a debt service coverage ratio of 1.0:1.0;
- a net debt to EBITDA ratio of 4.0:1.0; and
- a total debt to total capitalization ratio of 0.7:1.0.

As of December 31, 2018, we were in compliance with these ratios.

Short-term indebtedness and revolving credit lines

Our consolidated short-term indebtedness, including the current portion of our long-term debt, was US\$32.5 million, including principal and interest, as of December 31, 2018.

We believe that we will continue to be able to obtain sufficient credit to finance our working capital needs based on current market conditions and our liquidity position.

Long-term indebtedness

The following discussion briefly describes our principal financing agreements as of December 31, 2018.

Export credit notes. In the first quarter of 2017, Nexa Brazil issued a R\$100.0 million (US\$31.2 million as of December 31, 2017) export credit note to Banco ABN Amro S.A. due February 2020 and bearing interest at 118.0% of the CDI rate. In the second quarter of 2017, Nexa Brazil issued a US\$31.4 million export credit note to Banco Citibank S.A. due April 2020 and bearing interest at three-month LIBOR plus 1.85%. Each export credit note is guaranteed by Nexa Resources. Both export credit notes were repaid in full on March 2018.

Nexa Resources Bond. On May 4, 2017, we issued an aggregate principal amount of US\$700.0 million in bonds maturing in 2027 and bearing interest at 5.375% per year, receiving net proceeds of US\$691.2 million. These securities are guaranteed by our subsidiaries Nexa Brazil, Nexa Peru and Nexa CJM. As of December 31, 2018, the outstanding amount under these bonds was US\$696.8 million, which is related to a principal amount of US\$700.0 plus an accrual of US\$2.7 million related to interest, net of borrowing costs of US\$9.1 million. See Note 15 to our consolidated financial statements.

Export prepayment facilities. In May 2018, we renegotiated our export prepayment facility with ABN Amro Bank N.V., in an amount of US\$100.0 million, bearing interest at a rate of six-month LIBOR plus 1.27%. The proceeds for this loan were originally used to repay a portion of existing 2014 export prepayment facilities. In the same month, we entered into a new export prepayment facility with Scotiabank & Trust (Cayman) Ltd., in an amount of US\$100.0 million and interest rate of six-month LIBOR plus 1.27%. The proceeds for this transaction were used to repay our existing export prepayment facility with Natixis New York Branch, in the amount of US\$100.0 million and bearing interest at a rate of three-month LIBOR plus 2.55%. The export prepayment facility with ABN Amro Bank N.V. is guaranteed by Nexa Brazil and Nexa CJM, and the export prepayment facility with Scotiabank & Trust (Cayman) Ltd. is guaranteed by Nexa Brazil and Nexa CJM. These export prepayment facilities are secured by liens on certain collection accounts associated with these facilities. As of December 31, 2018, the outstanding principal amount under these loan agreements was US\$200.0 million: US\$100.0 million with Scotiabank & Trust (Cayman) Ltd., and US\$100.0 million with ABN Amro Bank N.V.

ECA facility: On June 27, 2018, we entered into an export credit agency, or ECA, facility, with BBVA as lender, the Italian agency SACE S.p.A as insurer and Nexa Brazil as guarantor. This facility amounts to US\$62.5 million and bears interest at six-month LIBOR plus 1.10%. The proceeds were used to finance several capital expenditures in Brazil. Principal and interest repayments are semi-annual, commencing on December 27, 2018 and maturing in June 2026. As of December 31, 2018, the outstanding principal under this loan agreement was US\$58.6 million.

Nexa Peru Bond. On March 28, 2013, Nexa Peru issued 4.625% senior notes due 2023, or the 2023 Notes, in an aggregate principal amount of US\$350.0 million, maturing on March 28, 2023. The 2023 Notes bear interest at a rate of 4.625% per annum, payable on a semi-annual basis on March 28 and September 28 of each year. As of December 31, 2018, the outstanding amount under these notes was US\$343.0 million.

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Liquidity and Capital Resources

BNDES and FINEP. BNDES has been an important source of debt financing for our capital expenditures in Brazil. We, through our Brazilian subsidiaries, have entered into several loan agreements with BNDES for the expansion and modernization of certain fixed assets, studies and engineering projects, environmental investments and the acquisition of machinery and equipment. As of December 31, 2018, our aggregate outstanding amount under BNDES loan agreements was US\$83.3 million. For further details on our long-term financings with BNDES, please see the table below.

On December 27, 2018, we renegotiated a portion of our BNDES debt, in the principal amount of US\$59.5 million. Nexa Brazil extended the payment term to 120 installments, ending on December 15, 2028. As a result of our renegotiations, the debt now bears interest at the TLP rate plus 2.18% per annum. It previously bore interest at the TJLP rate plus 2.68% per annum. The renegotiation also changed the index of the debt to TLP. As of December 31, 2018, the outstanding amount of this portion of our BNDES debt was US\$65.5 million.

In December 2014, Nexa Brazil entered into a loan agreement with the Brazilian Financing Agency for Studies and Projects (*Financiadora de Estudos e Projetos*), or FINEP, to finance the research and development of various projects. As of December 31, 2018, our outstanding amount under this loan agreement was US\$4.2 million.

The following table sets forth selected information with respect Nexa Brazil's principal long-term financings with BNDES and our outstanding amount under these financings as of December 31, 2018.

Indebtedness	Borrower	Guarantor(s)	Interest Rate	Principal Payment Dates	Maturity Date	Principal Amount Outstanding As of December 31, 2018 (in millions of US\$)
R\$1,000.0 million BNDES Revolving Credit Agreement	Nexa Brazil	Nexa Resources	TLP plus 2.09% per annum	120 monthly installments commencing on January 15, 2019	December 15, 2028	18.1 18.1
R\$1,200.0 million BNDES Revolving Credit Agreement ⁽¹⁾	Nexa Brazil Nexa Brazil	Nexa Resources Nexa Resources	SELIC plus 3.10% per annum TJLP plus 2.82% per annum	60 monthly installments commencing on October 15, 2021 60 monthly installments commencing on September 15, 2017	September 15, 2026 September 15, 2026	12.4 11.9
Total		Nexa Resources	TLP plus 1.89% per annum	120 monthly installments commencing on January 15, 2019	December 15, 2028	41.4 65.7
Total BNDES Long-Term Indebtedness						83.8

(1) Consists of three tranches.

CONTRACTUAL OBLIGATIONS

The following table sets forth certain of our contractual obligations as of December 31, 2018.

	Payments Due by Period				
	Total	Less than 1 year	1 - 3 years (in millions of US\$)	3 - 5 years	More than 5 years
Loans and financings ⁽¹⁾	1,870.7	91.9	261.2	620.0	897.7
Derivative financial instruments ⁽²⁾	14.2	8.7	5.0	0.6	—
Trade payables	387.2	387.2	—	—	—
Confirming payable ⁽³⁾	70.4	70.4	—	—	—
Salaries and payroll charges	58.2	58.2	—	—	—
Related parties	1.6	0.1	1.5	—	—
Provisions - Asset retirement obligation ⁽⁴⁾	287.1	12.3	40.2	36.6	198.1
Use of public assets ⁽⁵⁾	41.6	1.4	3.1	3.5	33.7
Long-term commitments ⁽⁶⁾	49.3	12.1	16.3	8.3	12.6
Total	2,780.3	642.3	327.3	669.0	1,142.1

(1) Reflects projected undiscounted cash flow of principal and interest as of December 31, 2018.

(2) See Note 6 to our consolidated financial statements.

(3) Certain of our subsidiaries have entered into agreements extending payment terms from 90 to 180 days with several suppliers. These suppliers have discounted their receivables with banks.

(4) Represents the undiscounted cash flows to settle the provision for asset retirement, including interest to be incurred.

(5) Represents the amounts established in the concession contracts regarding the rights to hydroelectric power generation (onerous concession) under use of public assets agreements. The amounts are accounted in “Other liabilities” in our consolidated balance sheet.

(6) Represents capital expenditures commitments related to our Aripuanã project and forward purchase commitments for process input materials used in our operations. For additional information, see Note 27 to our consolidated financial statements.

OFF-BALANCE SHEET ARRANGEMENTS

As of December 31, 2018, we did not have off-balance sheet arrangements of the type that we are required to disclose under Item 5.E of Form 20-F.

RISK MANAGEMENT

We consider market risk to be the potential loss arising from adverse changes in market rates and prices. We are exposed to several market risks arising from our normal business activities. These market risks, which are beyond our control, principally involve the possibility that changes in commodity prices, interest rates or exchange rates will adversely affect the value of our inventory, financial assets and liabilities or future cash flows and earnings. For information on our risk management policies, see Note 5 to our consolidated financial statements.

Financial risk

Our financial risk management policy seeks to preserve our liquidity and protect our cash flow and its operating components (revenues and costs), as well as financial components (financial assets and liabilities) against adverse credit and market events such as fluctuations in currency and interest rates.

A significant portion of the products we sell are commodities, with prices based on international indices and denominated in U.S. dollars. A portion of our costs, however, are denominated in *reais* and *soles*, and therefore leads to a mismatch of currencies between our revenues and costs. Additionally, our indebtedness is based on different indices and currencies, which may impact our cash flows.

Our current financial risk management policy includes:

- Foreign Exchange Exposure Management. Foreign exchange exposure is our exposure to fluctuations in the currencies that make up our commercial, operational and financial relations (the *real* and *sol*), and that may impact our U.S. dollar cash flow. All actions in the financial risk management process are intended to hedge our cash flow in U.S. dollars, to maintain our ability to pay our financial obligations and to comply with liquidity and indebtedness levels defined by our management team. Our foreign exchange hedge mechanisms are based on the foreign exchange exposure that is projected at least for 12 months after a reference date.
- Interest Rate Exposure Management. Exposure to the interest rate is our exposure to fluctuations in each of the indices of interest rates (mainly CDI, LIBOR and TJLP) from loans and financing transactions and financial investment that may impact our cash flow. Interest rate fluctuations would also result in gains or losses in the market value of our fixed rate debt portfolio due to differences in market interest rates and the rates at the execution of the debt agreements.
- Commodity Exposure Management. Exposure to commodity prices is our exposure to income and operating costs fluctuations due to changes in the reference prices for commodities (*e.g.*, zinc, copper, silver) based on demand, production capacity, producers' inventory levels and commercial strategies and the availability of substitutes in the global market. We calculate our exposure at least for 12 months after a reference date, considering any derivative financial instrument that has a certain commodity as the underlying asset.
- Counterparties' and Issuers' Risk Management. This policy establishes exposure limits for financial and non-financial institutions that are counterparties of financial transactions and/or issuers of debt securities. The purpose of our counterparties' and issuers' risk management is to mitigate the occurrence of negative impacts on our cash flows from the non-fulfillment of financial obligations by these issuers and counterparties. In the case of financial investments (cash allocation), we measure exposure to credit risk of issuers by the sum of gross balances of financial investments. In the case of derivative transactions, the credit risk exposure of a certain counterparty and transaction is measured by the pre-settlement risk using statistical models. Exposure limits are determined based on ratings assigned by rating agencies and the equity of the relevant financial institution.

- Liquidity and Financial Indebtedness Management. This policy establishes guidelines for managing our liquidity and financial indebtedness. The main instrument for measuring and monitoring liquidity is a cash flow projection, considering a minimum projection period of 12 months from the reference date. Liquidity and debt management considers as an objective the comparable metrics provided by global credit rating agencies for investment grade entities. With respect to indebtedness, metrics considered compatible with the relevant objective are considered.

All proposals must comply with the guidelines and rules set forth in our Financial Risk Management Policy and subsequently submitted for review by our finance committee and then for our board of directors' approval, under the governance structure set forth in our Financial Risk Management Policy.

Foreign exchange risk

We are subject to foreign exchange risks resulting from the fluctuation of the *real* and the *sol* against the U.S. dollar, our functional currency. All actions in the market risk management process related to our foreign exchange exposure are intended to hedge our cash flow in U.S. dollars, to maintain our ability to pay our financial obligations and to comply with liquidity and indebtedness levels defined by our management. In 2018, we recorded losses in translation of balances in foreign currency of US\$148.5 million. In 2017, we recorded losses in translation of balances in foreign currency of US\$53.9 million. In 2016, we recorded gains in translation of balances in foreign currency of US\$124.5 million.

Assuming an exchange rate appreciation (devaluation) of 10.0% of the *real* against the U.S. dollar as of December 31, 2018, we estimate that our profit for the year would have increased (decreased) by US\$35 million for 2018.

We are also exposed to market risk associated with changes in foreign currency exchange rates as certain costs incurred are in currencies other than our functional currency.

Interest rate risk

A portion of our outstanding debt bears interest at variable rates and, accordingly, is sensitive to changes in interest rates. Based upon our indebtedness as of December 31, 2018, an increase (decrease) in LIBOR of 25.0% would impact our profit and cash flows by US\$0.5 million. We calculate our exposure to fluctuations in interest rates at least for 12 months after a reference date, considering any derivative financial instrument that has certain index as the underlying asset. Based on these exposures, we prepare financial protection proposals, which are submitted for our finance committee's approval. The hedges of interest rates, in general, seek to exchange fixed interest rate to floating interest rate or vice versa.

Metal price sensitivity

We are subject to market risks arising from the volatility of prices of zinc, copper, lead and silver, and to a lesser extent gold. Assuming that expected metal production and sales are achieved, that tax rates are unchanged, and giving no effect to potential hedging programs, metal price sensitivity factors would indicate the following change in our 2018 profit attributable to us resulting from metal price changes.

	Zinc	Copper	Silver
Change in metal price (in percentage)	10.0%	10.0%	10.0%
Annual change in profit attributable to us (in millions of US\$)	87	18	8
Change in EBITDA (in millions of US\$)	125	26	11

Derivative instruments

To hedge against market risk, we enter into derivative transactions under our Financial Risk Management Policy. Those transactions are carried out in the over-the-counter market under master agreements such as International Swaps and Derivative Association and Brazilian CGD (*Contrato Geral de Derivativos*) Agreements.

None of the derivative transactions we are party to as of December 31, 2018 have corporate guarantees or require margin calls or any kind of collateral. None of the derivatives we were party to as of December 31, 2018 was entered into for speculative or arbitrage purposes.

We have the following recurring hedge programs in place:

- Fixed price commercial transactions (customer hedge): Hedging transactions that convert sales at fixed prices to floating prices in commercial transactions with customers interested in purchasing products at fixed prices. The purpose of this strategy is to maintain the revenue flow of the business unit with prices linked to the LME prices. These operations usually relate to purchases of zinc for future settlement on the over-the-counter market.
- Hedges for mismatches of “quotation periods” (book hedge): Hedges that set prices for the different “quotation periods” between the purchases of certain inputs (metal concentrate) and the sale of products arising from the processing of these inputs, or different “quotation periods” between the purchase and the sale of the same product. These operations usually relate to purchases and sales of zinc and silver for future trading on the over-the-counter market.
- Hedges for “operating margin” (strategic hedge): Derivatives contracted to reduce the volatility of the cash flow from its zinc, copper and silver operations. With a view to ensuring a fixed operating margin in *reais* for a portion of the Brazilian production of metals, the mitigation of risks is carried out through the sale of zinc forward contracts with the sale of U.S. dollar forward contracts.

To execute our hedge programs, as well as any sporadic hedging demands, we and our subsidiaries mainly enter into average-rate (Asian) forwards, collars and swaps and standard interest rate swaps. These are the types of derivatives applicable for the hedge of our exposures, according to our Financial Risk Management Policy.

We initially recognize derivative instruments at fair value on the date a derivative contract is entered into and subsequently re-measure at their fair value. The method of recognizing the resulting gain or loss depends on whether we designate the derivative as a hedging instrument, in the case of adoption of hedge accounting, and if so, the nature of the item being hedged. We adopt the hedge accounting procedure and designate certain derivatives as either:

- hedges of the fair value of recognized assets or liabilities or a firm commitment (fair value hedge); or
- hedges of a particular risk associated with a recognized asset or liability or a highly probable forecast transaction (cash flow hedge).

We document the relationship between hedging instruments and hedged items at the inception of the hedging transaction, as well as the risk management objective and strategy for the undertaking of the various hedge transactions. We also document our assessment, both at the inception of the hedge and on an ongoing basis, of whether the derivatives that are used in hedging transactions have been and will continue to be highly effective in offsetting changes in fair values or cash flows or fair values of hedged items.

III. SHARE OWNERSHIP AND TRADING**MAJOR SHAREHOLDERS**

As of March 25, 2019, Nexa Resources has 133,320,513 common shares, with par value of US\$1.00 per share. The table below sets forth the list of our shareholders and their participation in our capital stock.

Votorantim S.A., or VSA, is Nexa Resources' controlling shareholder. VSA does not have any different voting rights, but as long as it holds a majority of our voting stock, it can influence or control matters requiring approval by our shareholders, including the election of directors. The address for VSA is Rua Amauri, 255, 14^o andar, Room A, in the city of São Paulo, state of São Paulo, Brazil. VSA acquired all its shares in Nexa Resources on February 26, 2014.

Shareholder	Number	Share Capital (%)
VSA	85,655,128	64.25%
Directors and executive officers as a group	7,334,129	5.50%
Treasury	466,231	0.35%
Public	39,865,025	29.90%
Total	133,320,513	100.00%

VSA

As of March 25, 2019, Hejoassu Administração S.A., or Hejoassu, is the sole shareholder of VSA's capital stock, which consists of 18,278,788,894 common shares. Hejoassu is indirectly wholly-owned by Ermírio Pereira de Moraes, Maria Helena Moraes Scripilliti, José Ermírio de Moraes Neto, José Roberto Ermírio de Moraes, Neide Helena de Moraes and the descendants of Antonio Ermírio de Moraes through controlled companies. The business address of Hejoassu is Rua Amauri, 255, 12^o andar, in the city of São Paulo, State of São Paulo, Brazil.

RELATED PARTY TRANSACTIONS

We enter into transactions with our shareholders and companies that are owned or controlled, directly or indirectly, by VSA in our ordinary course of business. These transactions in the ordinary course of business are conducted on an arms' length basis and in accordance with applicable laws and our corporate governance policies.

In accordance with article 441-7 of the Luxembourg law of August 10, 1915 concerning commercial companies, as amended (or 1915 Law), any member of our board of directors having a direct or indirect financial interest conflicting with that of Nexa Resources in a transaction put before the board for consideration must advise the board thereof and cause a record of such member's statement to be included in the minutes of the meeting. The director may not take part in these deliberations and at the next following general meeting of shareholders of Nexa Resources, before any other resolution is put to vote, a special report shall be made on any such conflicted transactions. This shall not apply where the decision of the board relates to ordinary business entered into under normal market conditions.

The table below sets forth the balances of our principal related party transactions as of the dates and periods indicated.

	As of December 31, 2018 (in millions of US\$)
Related Party Transaction Balances	
Current assets	
Trade Accounts Receivable	
Companhia Brasileira de Alumínio	0.2
Votorantim Cimentos S.A.	0.6
Other	0.2
Total	1.0
Non-current assets	
Votorantim Cimentos S.A.	0.7
Total	0.7
Trade payables	
Votorantim S.A.	0.5
Votorantim Comercializadora de Energia Ltda.	2.0
Other	0.9
Total	3.4
Dividends payable	
Other	0.6
Total	0.6
Current and non-current liabilities	
Other	1.6
Total	1.6

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Related Party Transactions

	<u>For the Year Ended December 31, 2018</u> (in millions of US\$)
Related Party Transaction Revenues and Expenses	
Sales	
Companhia Brasileira de Alumínio	0.2
Votorantim Cimentos S.A.	2.1
Total	2.3
Purchases	
Votorantim S.A.	3.6
Companhia Brasileira de Alumínio	1.6
Votorantim Comercializadora de Energia Ltda.	10.1
Votorantim Cimentos S.A.	0.4
Other	4.9
Total	20.6

Certain transactions with our shareholders and their affiliates

Beginning in April 2016, when a group of investors acquired a minority stake in Nexa Resources, we had in place a mechanism pursuant to which certain benefits derived from the Brazilian energy generation assets held by our subsidiary Nexa Brazil were transferred to our controlling shareholder VSA. This mechanism required us to pay annual compensation to VSA in an amount equivalent to the economic benefits we derived from the energy generation assets, which was calculated based on the difference between a predetermined comparable market rate and the cost of producing the energy consumed by our Brazilian subsidiaries. In 2016, this mechanism resulted in a total compensation of US\$52.8 million, paid to VSA during the first quarter of 2017, that we recognized directly in equity.

During 2017, our shareholders agreed to replace the mechanism described above with a new arrangement intended to ensure access to energy supply at market rates while allowing us to continue to obtain some benefits associated with holding the energy generation assets, such as discounts on the charges applicable on the transportation and delivery of energy to end users. Pursuant to this arrangement, each of the energy generation assets were transferred to a holding company called Polarix, which became our consolidated subsidiary, and Nexa Brazil entered into power purchase agreements at market prices with each of the energy generation assets owned by Polarix. We hold 33.33% of Polarix's total share capital (represented by ordinary shares) and VSA and/or its affiliates hold the remaining 66.67% of Polarix's total share capital (represented by preferred shares with limited voting rights). Under the terms of the preferred shares, VSA is entitled to dividends per share equal to 1.25 times the dividends per share payable on the common shares. See "Information on the Company—Other operations—Power and energy supply."

Because this arrangement has been formally approved at the general meeting of our shareholders and the Brazilian energy generation assets are under common control with VSA, we have reflected the changes associated with the new arrangement retroactively in our consolidated financial statements to improve the comparability of the results for the periods presented.

In September 2018, ANEEL consented to the transfer of the energy assets. The transaction concluded in December 2018. See Note 12 to our consolidated financial statements.

Cost-sharing agreement with VSA

We entered into an agreement with VSA on September 4, 2008, for services provided by the Center of Excellence (*Centro de Excelência*) of VSA related to administrative activities, human resources, back office services, accounting, taxes, technical assistance, and training, among other activities. Under a cost sharing

agreement, the Company reimburses VSA for the expenses related to these activities that pertain to Nexa. We do not expect to negotiate any material changes in the terms and conditions of our cost-sharing agreement with VSA.

Purchases of electricity from Votener

We purchased electricity from Votener, a subsidiary of VSA, in an aggregate amount of US\$11.3 million in 2017. The price of electricity we purchased was based on market prices. Upon concluding the current structure related to our Brazilian energy assets, we do not expect to negotiate additional purchases of electricity in the near future. See “Operating and financial review and prospects—Overview—Key factors affecting our business and results of operations—Operating costs and expenses—Energy costs” and “Other operations—Power and energy supply.”

DISTRIBUTIONS

We intend to make annual distributions on our common shares. The amount of distributions will be subject to the requirements of Luxembourg law and the approval of our board of directors or our shareholders, as applicable, and will depend on a number of factors, including, but not limited to, our cash balance, cash flow, earnings, capital investment plans, expected future cash flows from operations, our strategic plans and cash dividend distributions from our subsidiaries, as well as legal requirements and other factors we may deem relevant at the time. As of December 31, 2018, there are no contractual restrictions on our ability to make distributions to our shareholders. Subject to these considerations, we intend to distribute each year amounts equal to at least 2.0% of our average market capitalization for the previous fiscal year. For this purpose, our average market capitalization for a fiscal year is the sum of the daily market capitalization for each NYSE trading date in such fiscal year divided by the number of NYSE trading days in such fiscal year, where the daily market capitalization for any trading day is the product of the NYSE closing price per share in U.S. dollars of our common shares on such trading day and the number of common shares outstanding on such trading day.

Each common share entitles the holder to participate equally in distributions, unless the right to distributions has been suspended in accordance with our articles of association or applicable law.

We intend to declare and make distributions in our common shares in the form of either dividends or reimbursements of share premium. Under Luxembourg law, dividends are determined by a simple majority vote at a general shareholders' meeting based on the recommendation of our board of directors. Furthermore, pursuant to our articles of association, the board of directors has the power to declare interim dividends and/or proceed with reimbursements of share premium in accordance with the 1915 Law.

We and our subsidiaries are subject to certain legal requirements that may affect our ability to pay dividends or other distributions. Distributions to shareholders (including in the form of dividends or reimbursement of share premium) may only be made from amounts available for distribution in accordance with Luxembourg law, determined based on our standalone statutory accounts prepared under Luxembourg GAAP. Under Luxembourg law, the amount of a distribution paid to shareholders (including in the form of dividends or reimbursement of share premium) may not exceed the amount of the profits at the end of the last financial year plus any profits carried forward and any amounts drawn from reserves that are available for that purpose, less any losses carried forward and sums to be placed in reserve in accordance with Luxembourg law or our articles of association. Furthermore, no distributions (including in the form of dividends or reimbursement of share premium) may be made if at the end of the last financial year the net assets as set out in the standalone statutory accounts prepared under Luxembourg GAAP are, or following such a distribution would become, less than the amount of the subscribed share capital plus the non-distributable reserves. Distributions in the form of dividends may only be made from net profits and profits carried forward, whereas distributions in the form of share premium reimbursements may only be made from available share premium.

Luxembourg law also requires at least 5.0% of our net profits per year to be allocated to the creation of a legal reserve until such reserve has reached an amount equal to 10.0% of our issued share capital. If the legal reserve subsequently falls below the 10.0% threshold, at least 5.0% of net profits again must be allocated toward the reserve. The legal reserve is not available for distribution. As of December 31, 2018, the legal reserve is zero. See "Additional information—Articles of association—Distributions."

We can provide Nexa Resources with the capacity to pay dividends by causing our subsidiaries to pay dividends to Nexa Resources, subject to any conditions under the corporate law applicable to each subsidiary. This would result, after any related costs, in profits at Nexa Resources, which would contribute to creating amounts that, after mandatory allocations of profits, are available for distribution as dividends in accordance with Luxembourg law as described above.

The balance of the share premium account as of December 31, 2018 was US\$1,043.7 million. This amount was calculated based on the share premium reserve, plus any profits made since the end of last financial year, less losses carried forward, as set forth in our standalone statutory accounts as of December 31, 2018 prepared under Luxembourg GAAP.

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Distributions

The table below describes the distributions paid to our shareholders in the form of share premium reimbursements for the periods indicated.

For the Year Ended December 31,				
2018	2017 ⁽¹⁾	2016 (in millions of US\$)	2015	2014
80.0	430.0	69.9	—	—

(1) Amount paid in 2017 represents amounts distributed prior to the completion of the Company's initial public offering.

On February 15, 2019, the board of directors approved a cash dividend of up to US\$70.0 million, corresponding to US\$0.525 per share paid to the shareholders on March 28, 2019.

We are a holding company and have no material assets other than our ownership of shares in our subsidiaries. When we pay a dividend or other distribution on our common shares in the future, we generally cause our operating subsidiaries to make distributions to us in an amount sufficient to cover any such dividends or distributions. Our subsidiaries' ability to make distributions to us is subject to their capacity to generate sufficient earnings and cash flow and may also be affected by statutory accounting and tax rules in Brazil and Peru. As of December 31, 2018, there are no material contractual restrictions on our subsidiaries' ability to make distributions to us.

A Luxembourg withholding tax of 15.0% is generally due on dividends and similar distributions made by us to our shareholders. However, distributions on our common shares that are sourced from a reduction of share capital or share premium are not subject to Luxembourg withholding tax if we do not have distributable reserves or profits in our standalone statutory accounts prepared under Luxembourg GAAP. See "Additional information—Taxation—Luxembourg tax considerations—Shareholders."

There is no law, governmental decree or regulation in Luxembourg that would affect the remittance of dividends or other distributions by us to nonresident holders of our common shares, other than withholding tax requirements. In certain limited circumstances, the implementation and administration of international financial sanctions may affect the remittance of dividends or other distributions. There are no specified procedures for nonresident holders to claim dividends or other distributions.

Computershare Trust Company, N.A. is the paying agent for shareholders who hold common shares listed on the NYSE and on the TSX. Dividends and other distributions on our common shares will be declared and paid in U.S. dollars. Dividends and other distributions on common shares listed on the NYSE will be the same as for common shares listed on the TSX.

TRADING MARKETS

Our publicly traded share capital consists of common shares with a par value of US\$1.00 per share. Our common shares are publicly traded in the United States on the New York Stock Exchange (or NYSE), under the ticker symbol NEXA. Our common shares also trade on the Toronto Stock Exchange (or TSX), under the ticker symbol NEXA. On March 25, 2019, there were 133,320,513 common shares issued.

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Purchases of Equity Securities by the Issuer and Affiliated Purchasers

PURCHASES OF EQUITY SECURITIES BY THE ISSUER AND AFFILIATED PURCHASERS

On September 13, 2018, the general meeting of shareholders of Nexa Resources approved a general authorization to the board of directors to establish, from time to time, share buyback programs pursuant to which we, directly or indirectly through our subsidiaries, may purchase, acquire, receive or hold and sell shares of Nexa Resources listed on the New York Stock Exchange or Toronto Stock Exchange.

On September 20, 2018, our board of directors approved a share buyback program, under which we, directly or indirectly through our subsidiaries, may repurchase, from time to time, up to US\$30.0 million of our outstanding common shares listed on the New York Stock Exchange over a 12-month period beginning on November 6, 2018 and ending on November 6, 2019. Under this share buyback program, we may repurchase our common shares for cash in accordance with all applicable securities laws and regulations and within the limits of the authorization approved in the general meeting of shareholders of Nexa Resources held on September 13, 2018. The repurchased shares will be held in treasury.

During 2018, we repurchased 112,388 common shares, at an average price of US\$12.00 per share, for an aggregate purchase price of US\$1.350 million. The common shares repurchased in 2018 represent 0.24% of the free float of common shares outstanding before the launch of the program. As of March 25, 2019, we have repurchased 466,231 common shares, at an average price of US\$10.63 per share, for an aggregate purchase price of US\$4.96 million, corresponding to 0.35% of the free float of common shares outstanding before the launch of the program.

The results of our share repurchase program as of March 25, 2019 are set forth below.

Period	Total number of shares (or units) purchased ⁽¹⁾	Average price paid per share (or units) (in US\$)	Total number of shares (or units) purchased as part of publicly announced plans or programs	Maximum number (or approximate US\$ value) of shares (or units) that may yet be purchased under the program ⁽²⁾
<i>Common shares</i>				
November 6-30, 2018	24,600	12.40	24,600	6,475,400
December 1-31, 2018	87,788	11.89	87,788	6,387,612
January 1-31, 2019	161,735	10.04	161,735	6,225,877
February 1-28, 2019	141,334	9.75	141,334	6,084,543
March 1-25, 2019	50,774	11.90	50,774	6,033,769
Total	466,231	10.63	466,231	6,033,769

(1) All shares purchased through the program publicly announced on September 20, 2018.

(2) The board of directors authorized Nexa Resources to purchase up to US\$30 million of its outstanding common shares listed on the New York Stock Exchange. The program expires on November 6, 2019.

IV. CORPORATE GOVERNANCE, MANAGEMENT AND EMPLOYEES

CORPORATE GOVERNANCE

Our corporate governance model is aimed at facilitating the flow of information between our executives and other key decision-makers on our management team, specifically, our board of directors, advisory committees and management committee. Our corporate governance model also provides a framework for the duties of our management team, including oversight of the Company's performance and decision-making. Our main corporate governance activities include support for board of directors, board advisory committees and executive board meetings; contribution to the process of preparing the annual report on governance practices; elaboration of governance documents and updating of best practices; and participation in the development of corporate governance communication material.

Our corporate governance model is designed to ensure that the proper corporate governance principles are consistently applied within our organization. The Canadian Securities Administrators have issued corporate governance guidelines pursuant to National Policy 58-201—*Corporate Governance Guidelines* (the “Canadian Corporate Governance Guidelines”), together with certain related disclosure requirements pursuant to National Instrument 58-101—*Disclosure of Corporate Governance Practices*, or NI 58-101. The Canadian Corporate Governance Guidelines are recommended as “best practices” for issuers to follow. We recognize that good corporate governance plays an important role in our overall success and in enhancing shareholder value and, accordingly, we have adopted certain corporate governance policies and practices which reflect our consideration of the recommended Canadian Corporate Governance Guidelines. These include adopting internal rules for the board of directors, being equivalent to a board mandate and appointing key committees that have independent representation and leadership, including an audit committee comprised of all independent directors, and a compensation, nominating and governance committee, of which one of the two committee members is independent. The internal rules, equivalent to a committee charter, for the compensation, nominating and governance committee includes responsibility for reviewing and assessing the size, composition and operation of the board of directors to ensure effective decision making, advising on potential conflicts of interest situations and developing corporate governance guidelines and principles. These include ensuring that appropriate processes and structures are implemented to facilitate the exercise of independent judgment by the members of the board. The disclosure set out below describes in further detail our approach to corporate governance in relation to the Canadian Corporate Governance Guidelines.

Meetings of the board of directors and attendance

The board of directors ordinarily meets in person or by other means of communication as may be required. The frequency of and agenda items for board meetings will vary depending on the state of affairs, requirements for approvals and opportunities available to the Company and the risks and issues which the Company faces. The agenda for meetings places priority and focuses on key issues for the Company, which are identified by the chairman of our board. Routine business is dealt with after substantive discussions on the key issues.

Under the board of directors' internal rules and our articles of incorporation, the board can validly consider any matters and make decisions provided at least a majority of the members are in attendance in person or by representation. The internal rules of the board of directors further provide that each member is entitled to one vote either in person or where duly represented as required by the board's internal rules. In fiscal year 2018, our board of directors held nine meetings, in which the rate of attendance in person or by representation was 100% of the directors.

Director	Board Meetings	Meetings Attended	Overall % Attendance
Luís Ermírio de Moraes	9 of 9	9	100%
Daniella Dimitrov	9 of 9	9	100%
João Henrique Batista de Souza Schmidt	9 of 9	9	100%
Eduardo Borges de Andrade Filho	9 of 9	9	100%
Diego Hernandez	9 of 9	9	100%
Jean Simon	9 of 9	9	100%
Edward Ruiz	9 of 9	9	100%
Ivo Ucovich	9 of 9	9	100%
Jane Sadowsky	9 of 9	9	100%

As set forth in the internal rules for the board of directors, the independent directors may hold meetings in which members of the management team and the non-independent directors are not present. In 2018, our directors held in-camera sessions without members of the management team prior or the conclusion of each board meeting.

Committees of our board of directors

Our board of directors has an audit committee, a finance committee and a compensation, nominating and governance committee. Our board of directors may have other committees as it may determine from time to time. Each of the standing committees of our board of directors has the composition and responsibilities assigned to them by the meeting of the board of directors that created such committee and as set forth in their respective internal rules, being an equivalent to a committee charter. As set forth in the respective internal rules of the committees, each of the committees may meet with or without the management, as the case may be, at the discretion of the committee. The charter for each of the committees of our board of directors is available on our website.

Audit committee

Our audit committee is a standing committee established by our board of directors on March 28, 2017 to assist the board of directors in fulfilling certain of its oversight responsibilities. The audit committee may be composed of three to five members, each appointed by our board of directors for a term of one year. Daniella Dimitrov, Edward Ruiz and Jane Sadowsky currently serve as its members. These individuals are independent under Canadian securities regulators' National Instrument 52-110 Audit Committees, as well as under Rule 10A-3 and applicable NYSE standards. In addition, each of them satisfies the financial literacy requirement under applicable rules. Our board of directors has determined that Mr. Edward Ruiz qualifies as an "audit committee financial expert."

Our audit committee's primary responsibilities are to assist the board of directors' oversight of: (1) quality and integrity of our financial reporting and related financial disclosure; (2) the effectiveness of our internal control over financial reporting and disclosure controls and procedures; (3) our compliance with legal and statutory requirements as they relate to financial statements and related financial disclosures; (4) risk management and monitoring processes; and (5) the qualifications, performance and independence of our independent auditors and performance of the internal audit function.

Nexa has established policies and procedures that require any engagement of our independent auditor for audit or non-audit services to be submitted to and pre-approved by the audit committee. In addition, our audit committee may delegate the authority to pre-approve non-audit services to one or more of its members. All non-audit services that are pre-approved pursuant to such delegated authority must be presented to the full audit committee at its first scheduled meeting following such pre-approval. Our audit committee shall pre-approve all audit and non-audit services to be provided to us by our independent auditor and also has the authority to recommend pre-approval policies and procedures to our board of directors and for the engagement of our independent auditor's services.

Finance committee

Our finance committee is a standing committee established by our board of directors on March 28, 2017 to assist the board of directors in fulfilling certain of its oversight responsibilities. The finance committee may be composed of three to five members, each appointed by our board of directors for a term of one year. Diego Cristóbal Hernandez Cabrera, Edward Ruiz and João Henrique Batista de Souza Schmidt currently serve as its members.

Our finance committee is responsible for: (1) assisting the board in analyzing the potential effects of the Brazilian and global economic situation on our financial position, as well as in the discussion of scenarios and trends and in the definition of strategies to be adopted by us within the scope of our financial policy; (2) referring, submitting and monitoring the approved financial risk management policies; (3) evaluating the policy regarding entry into insurance contracts and the scope of their coverage; (4) evaluating and monitoring the Company's

investment plan; (5) proposing cash and liquidity management guidelines for the Company; and (6) evaluating and validating the mechanisms for setting variable and long-term executive compensation and advising the compensation, nominating and governance committee in respect thereof.

Compensation, nominating and governance committee

Our compensation, nominating and governance committee (the “compensation committee”) is a standing committee established by our board of directors on March 28, 2017 to assist the board of directors in fulfilling certain of its oversight responsibilities. The compensation committee may be composed of two to five members, each appointed by our board of directors for a term of one year. Luís Ermírio de Moraes and Eduardo Borges de Andrade Filho currently serve as its members. One of the two members of the compensation committee is an independent director. External advisors with broad experience in the area have been retained to assist our compensation committee in carrying out its mandate.

Previously, our compensation committee was mainly responsible for determining the corporate standards and guidelines for compensation of our board members, officers and committee members. Following our initial public offering, we modified the structure of the compensation committee in order to include aspects related to corporate governance and the nomination of board members, officers and committee members. Therefore, our compensation, nominating and governance committee is now responsible for: (1) new compensation models and changes to compensation models currently used by us, in order to guide and influence our actions; (2) the compensation of the executive board, of the members of the board of directors and of the members of the committees of the board of directors; (3) the proposal of candidates to the chair of chief executive officer, when applicable, or any serious restrictions on the candidates proposed by the chief executive officer to the other chairs of the executive board; (4) development of corporate governance guidelines and principles; (5) identification of individuals qualified to be nominated as members of the board of directors and suggesting nominees to fill any vacancies on the board of directors; (6) the structure and composition of board committees; (7) evaluation of the performance and effectiveness of the board of directors, the chief executive officer and each of the board’s standing committees; and (8) any related matters required by applicable laws and stock exchange rules.

Appointment of members of our board of directors

In accordance with our articles of association and the Luxembourg law of August 10, 1915 on commercial companies, as amended (the “1915 Law”), the members of our board of directors are elected by a resolution of a general meeting of shareholders adopted with a simple majority of the votes validly cast, regardless of the portion of capital represented at such general meeting. Votes are cast for or against each nominee proposed for election to the board and cast votes shall not include votes attaching to shares for which the shareholder has not participated in the vote, has abstained or has returned a blank or invalid vote.

Under Luxembourg law, in the case of a vacancy of the office of a director appointed by the general meeting of shareholders, the remaining directors may, unless the articles of association provide differently, fill the vacancy on a provisional basis. In these circumstances, the following general meeting of shareholders shall make the final appointment of the director.

Internal rules for the board of directors

Our board of directors is responsible for supervising and directing the management of our business and affairs, including providing guidance and strategic oversight to our executives and other members of our management team. Our board of directors adopted internal rules for the board, an equivalent to a formal board mandate, which includes the following, among other things:

- establish the general guidance of our business, defining its mission, its strategic goals and its guidelines;
- adopt a strategic planning process, and approving, on at least an annual basis, a strategic plan which takes into account, among other things, the opportunities and risks of the business;

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Corporate Governance

- approve and recommend the shareholders to approve, subject to any thresholds and pursuant to our articles of association and the 1915 Law, any transactions relating to capital expenditure investments, loans or derivative contracts, mergers, spin-offs, divestitures, incorporation or joint venture operations;
- deliberate and decide on the annual programs of expenditure and investments;
- protect and create value for us;
- promote and comply with our corporate objectives and those of our subsidiaries;
- ensure our continuity in a long-term perspective and sustainability including the economic, social, environmental considerations and good corporate governance, in the definition of business and operations;
- approve the apportionment of directors' compensation, prepared with the support of the compensation, nominating and governance committee;
- develop our approach to corporate governance, including developing a set of corporate governance principles and guidelines that are specifically applicable to us;
- adopt a responsive management structure, composed of qualified professionals and spotless reputation, including satisfying itself as to the integrity of the chief executive officer and other executives and that the chief executive officer and other executives create a culture of integrity throughout the organization;
- ensure that strategies and guidelines are implemented by the management team;
- oversee the implementation of appropriate: capital structure, risk management, evaluation and compensation of our executives, internal controls system, compliance program, people management policy and internal rules, and corporate communications;
- evaluate the performance and effectiveness of our chief executive officer, based on the recommendation of the compensation, nominating and governance committee;
- maintain an updated succession plan for the chief executive officer and all of our other key personnel; and
- other matters required by applicable law and our articles of association.

The internal rules of our board of directors are available on our website.

Four of the nine directors on our board are independent directors. The board has at its disposal a set of provisions and practices that promotes independence in the decision-making process of the board. In accordance with the internal rules of the board, the independent members of the board may hold separate meetings and each director has a duty to declare, prior to any board meeting, the existence of a particular reason or conflict of interest with the Company with respect to a subject matter being discussed or considered by the board. Accordingly, such board member would be refrained from discussing and voting on a matter that could present a conflict of interest. Additionally, our board members are prohibited from holding executive positions with the Company and/or serving on more than four boards of directors of companies that do not belong to the same conglomerate. As discussed above, our audit committee is comprised entirely of independent directors and we also have independent representation on our compensation committee.

Chairman

The chairman of our board of directors is not an independent director of the Company, as he is also the Vice-Chairman of VSA. The board of directors has carefully considered governance issues relating to chairman

independence and believes that the chairman carries out separate responsibilities diligently and that, with the compensating practices in place, the board of directors operates effectively and in the Company's best interest.

Position descriptions

Our board of directors has developed a written position description for the chairman of the board of directors. The chairman of the board has the following responsibilities, subject to any other matters that may be set forth in our articles of association or provided for under applicable law:

- ensure the efficiency and proper performance of the board of directors;
- ensure the efficacy of the evaluation system applicable to the board of directors, the management team and the members of each of these bodies;
- streamline the activities of the board of directors with our interests, our shareholders and other stakeholders;
- organize and coordinate the agenda for meetings of the board of directors in cooperation with the secretary to the board, chief executive officer and other board members, as applicable;
- coordinate the activities of other board members;
- ensure that board members receive timely and comprehensive information about the items included on the agenda for each meeting;
- propose to the board of directors, on an annual basis, the appointment of a secretary;
- propose to the board of directors, in consultation with the board's committees, the annual budget of the board of directors;
- preside over the board meetings and general shareholders' meetings;
- coordinate with the chief executive officer and propose the annual corporate calendar to the board of directors, setting forth the dates of corporate events;
- organize, together with the chief executive officer, an integration and training program for each newly elected board member, and providing continuing education opportunities for all board members; and
- arrange for continuing education opportunities for all directors, to ensure that they enhance their relevant skills as directors and maintain updated knowledge and understanding of our business.

Our board of directors adopted internal rules, an equivalent to a committee charter, for each of its committees. These internal rules set out, among other things, the roles and responsibilities of the coordinator (chairman) of each of the committee.

Orientation and continuing education

We implemented an orientation program for new directors under which each new director meets with the chairman of our board of directors and our executives. New directors are provided with comprehensive orientation and education as to our business, operations and corporate governance (including the role and responsibilities of the board of directors and each committee).

The chairman of our board of directors is responsible for overseeing directors' continuing education and ensure that it is designed to maintain or enhance the skills and abilities of our directors and to ensure that their knowledge and understanding of our business remains current. The coordinator of each committee is responsible for coordinating orientation and continuing director development programs relating to the committee's mandate.

Our ongoing director education programs entails, as a matter of routine each year, site visits, presentations from outside experts and consultants, discussions on ongoing governance trends and guidelines for public companies, briefings from staff and management, and reports on issues relating to our projects and operations, sustainability and social matters, competitive factors, reserves, legal issues, economic, accounting and financial disclosure, mineral and hydrocarbon education and other initiatives intended to keep the board abreast of new developments and challenges that we may face.

Evaluation of directors

Our compensation, nominating and governance committee established a framework for the implementation and administration of processes to assess the effectiveness of the board and each of its members. This includes peer reviews of each director's performance and self-assessments, as well as full board and committee review of the board and the respective committees, by way of questionnaires, interviews and sessions with the chairman. In addition to hiring external advisors to develop and undertake this assessment, the compensation, nominating and governance committee is also responsible for overseeing the process and evaluating the results, with the objective of improving the performance of each director and the board of directors as a whole.

Considerations in evaluating director nominees

Our board of directors is responsible for nominating members for election to the board and for filling vacancies on the board that may occur between annual meetings of shareholders. The process for nominating a new director initiates with our compensation, nominating and governance committee which evaluates the Company's current circumstances and establishes a profile for a director candidate. Such profile is then shared with a specialized external executive search firm, who assists the compensation, nominating and governance committee in selecting candidates for interviews. Prior to the interview, the specialized external firm is responsible for a background check with former employers and colleagues of the respective candidates.

Following the interview(s), our compensation, nominating and governance committee recommends the nomination of the director candidate to our board of directors based upon an assessment of the independence, skills, qualifications and experience of such candidate. Specifically, the board seeks members from diverse professional and personal backgrounds who combine a broad spectrum of experience and expertise with a reputation for integrity.

Director term limits and other mechanisms of board renewal

Our articles of association provide that members of the board of directors are appointed for a period not exceeding one year by the general meeting of shareholders, with the possibility of renewal. In the event that a director appointed by the general meeting ceases to be a director for any reason, the remaining directors, by a simple majority vote of the directors present or represented, shall fill such vacancy by replacing such director with a new director nominated for appointment in place thereof. This director will be in office until the next general meeting of shareholders.

Diversity

We value diversity of abilities, experience, perspective, education, gender, background, race and national origin. We believe that having a diverse board of directors can offer a breadth and depth of perspectives that enhance our performance. Recommendations concerning director nominees are based on merit and past performance as well as expected contribution to the board's performance and, accordingly, diversity is taken into consideration. We believe that having a diverse and inclusive organization overall is beneficial to our success, and we are committed to diversity and inclusion at all levels of our organization to ensure that we attract, retain and promote the brightest and most talented individuals. We have recruited and selected executives that represent a diversity of business understanding, personal attributes, abilities and experience.

The compensation, nominating and governance committee and our board of directors have the responsibility to review and assess the composition of the board and each of its committees, and to identify, evaluate and recommend potential new directors. With respect to our executive officers, the compensation, nominating and governance committee reviews candidates recommended by the chief executive officer and makes the final

recommendation to the board of directors. In new director and executive officer appointments and ongoing evaluations of the effectiveness of our board and management team, each of the board's committees and each director, the board will take into consideration diversity as one of the factors in order to maintain an appropriate mix and balance of diversity, attributes, skills, experience and background on our board of directors and each of its committees and the management team. Ultimately, appointments to our board of directors and management team are based on merit against objective criteria and with due regard to the benefits of diversity in board and management team composition and the desire to maximize the effectiveness of corporate decision-making, having regard to the best interests of the Company and its strategies and objectives, including the interests of its shareholders and other stakeholders. During our selection process for board appointments, we seek to ensure that women candidates are always considered on the shortlist for nominations. Currently, two (or 22%) of our nine members of the board are women and one (or 11%) of our nine executives is a woman, and on a general basis, 11.5% of our overall employees are women.

Further, we established a diversity committee composed of three levels: strategic diversity committee, corporate diversity committee and local diversity committees representing each of our corporate offices and production plants. Pursuant to these committees' guidelines, "diversity" discussions include attributes such as gender, disability, ethnicity, age and other factors. In connection with this diversity initiative, we have adopted targets for gender at companywide levels and expect to adopt targets for other diversity representation. In 2018, our gender target was to have 12% of women represented companywide, and we achieved 11.5% representation of women in total. In 2018, the diversity committee's initiatives were honored with a second place award in the "Equal opportunities between women and men" category, promoted by the Peruvian Labor Ministry. For 2019, our gender target is to reach 14.5%, while for 2025 we intend to increase such target to 20% of women companywide. These targets are frequently monitored, global and locally, and action plans are implemented to achieve the proposed targets.

Compensation-setting process

Our compensation, nominating and governance committee is responsible for assisting our board of directors in fulfilling its governance and supervisory responsibilities, and advising our board of directors with respect to evaluation and monitoring of compensation models and policies performed every two years, which takes into account peer companies and the challenges and opportunities we face. The committee's responsibilities also include administering and determining our compensation objectives and programs, reviewing and making recommendations to our board of directors concerning the level and type of the compensation payable, evaluating performance, implementing evaluation and improvement processes, and ensuring that policies and processes are consistent with our philosophy and the objectives of our compensation program.

Code of conduct

We work with all of our employees, as well as third parties who interact with them, to ensure they behave in a manner consistent with our values, code of conduct and the key principles of its compliance program, particularly as these relate to the environment, human rights and labor related issues, health and safety, and anti-bribery and corruption. In 2018, we updated our compliance program based on the anti-corruption, anti-money laundering, anti-terrorist financing and antitrust laws in effect in the countries where we operate. As a result of this, the code of conduct was revised and is supported by compliance-related policies and procedures that are in the process of dissemination and implementation throughout the Company. Our directors and executives have certified that they have read and that they will comply with our code of conduct. A newly-created conduct committee is in charge of promoting the implementation of the code and supervising the application of disciplinary measures.

We have introduced several anti-corruption, anti-money laundering and antitrust initiatives, including, among other things, ethics and compliance training and an ethics hotline which enables employees and third parties to report misconduct. Information reported through our ethics hotline is investigated and following the investigation, disciplinary action may be taken, if necessary. We have not granted any implicit or explicit waivers from any provision of our code of conduct since its adoption.

Our code of conduct and main compliance-related policies are publicly available on our website at <https://www.nexaresources.com>. We will disclose future amendments to, or waivers of, our code of conduct on the

same page of our corporate website. Information contained on our website is not incorporated by reference into this report, and you should not consider information contained on our website to be part of this report.

Foreign private issuer and controlled company exemptions

Because we are a foreign private issuer, the NYSE rules applicable to us are considerably different from those applied to U.S. companies. Accordingly, we intend to take advantage of certain exemptions from NYSE governance requirements provided in the NYSE rules for foreign private issuers. Subject to the items listed below, as a foreign private issuer we are permitted to follow home country practice in lieu of the NYSE's corporate governance standards. Luxembourg law does not require that a majority of our board consist of independent directors or the implementation of a compensation committee or nominating and corporate governance committee. As a foreign private issuer, we must comply with four principal NYSE corporate governance rules: (1) we must satisfy the requirements of Exchange Act Rule 10A-3 relating to audit committees; (2) our chief executive officer must promptly notify the NYSE in writing after any executive officer becomes aware of any non-compliance with the applicable NYSE corporate governance rules; (3) we must provide the NYSE with annual and interim written affirmations as required under the NYSE corporate governance rules; and (4) we must provide a brief description of any significant differences between our corporate governance practices and those followed by U.S. companies under NYSE listing standards.

In addition, for purposes of the NYSE rules, as VSA beneficially owns a majority of our outstanding common shares, we are a "controlled company." "Controlled companies" under those rules are companies of which more than 50.0% of the voting power is held by an individual, a group or another company. Accordingly, we are eligible to take advantage of certain exemptions from NYSE governance requirements provided in the NYSE rules. Specifically, as a controlled company under NYSE rules, we are not required to have a majority of independent directors or a compensation, nominating and corporate governance committee composed entirely of independent directors.

As described further above, we recognize that good corporate governance plays an important role in our overall success and in enhancing shareholder value and, accordingly, we have adopted certain corporate governance policies and practices which reflect our consideration of the recommended Canadian Corporate Governance Guidelines. The following table briefly describes the significant differences between our practices and the practices of U.S. domestic issuers under NYSE corporate governance rules.

Section	NYSE corporate governance rule for U.S. domestic issuers	Our approach
303A.01	A listed company must have a majority of independent directors. "Controlled companies" and "foreign private issuers" are not required to comply with this requirement.	We are a controlled company because more than a majority of our voting power for the appointment of directors is controlled by VSA. We are a foreign private issuer because we are incorporated in Luxembourg. As a controlled company and foreign private issuer, we are not required to comply with the majority of independent director requirements. Four of our nine directors are independent. Our board of directors has adopted internal rules equivalent to a charter. See "Corporate Governance, management and employees — Management—Board of directors" for a description of our board and processes our board has implemented to promote the exercise of independent judgment.

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Section	NYSE corporate governance rule for U.S. domestic issuers	Our approach
303A.03	The non-management directors of a listed company must meet at regularly scheduled executive sessions without management.	We do not have any management directors.
303A.04	<p>A listed company must have a nominating/corporate governance committee composed entirely of independent directors, with a written charter that covers certain minimum specified duties.</p> <p>“Controlled companies” and “foreign private issuers” are not required to comply with this requirement.</p>	<p>As a controlled company and foreign private issuer, we are not required to comply with the nominating/corporate governance committee requirements. However, we do have a compensation, nominating and governance committee composed of one independent director and one non-independent director which has adopted internal rules, an equivalent to a committee charter.</p> <p>As set forth in the committee’s internal rules, this committee is responsible for, among other matters:</p> <ul style="list-style-type: none">• identifying individuals qualified to be nominated as members of the board of directors;• recommending nominees to fill any vacancies on the board of directors;• developing corporate governance guidelines and principles; and• evaluating the performance and effectiveness of the board of directors. <p>See “Corporate Governance, management and employees—Corporate governance—Committees of our board of directors.”</p>
303A.05	<p>A listed company must have a compensation committee composed entirely of independent directors, with a written charter that covers certain minimum specified duties.</p> <p>“Controlled companies” and “foreign private issuers” are not required to comply with this requirement.</p>	<p>As a controlled company and foreign private issuer, we are not required to comply with the compensation committee requirements. However, we do have a compensation, nominating and governance committee composed of one independent director and one non-independent director which has adopted internal rules for the committee, an equivalent to a committee charter.</p> <p>As set forth in the committee’s charter, this committee is responsible for, among other matters:</p> <ul style="list-style-type: none">• reviewing and proposing new compensation models and changes to current compensation models; and• determining compensation of executives, directors and committee members. <p>See “Corporate governance, management and employees—Corporate governance—Committees of our board of directors.”</p>

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Corporate Governance

Section	NYSE corporate governance rule for U.S. domestic issuers	Our approach
303A.06	A listed company must have an audit committee with a minimum of three independent directors who satisfy the independence requirements of Rule 10A-3 under the Exchange Act, with a written charter that covers certain minimum specified duties.	We have an audit committee composed of three members, all of whom qualify as independent under Rule 10A-3 and applicable NYSE standards. Each member of the audit committee also satisfies the financial literacy requirement under applicable standards. The audit committee has adopted internal rules for the committee, an equivalent to a committee charter, which was duly approved by the Company's board of directors.
303A.07		As set forth in the committee's internal rules, the committee shall assist the board of directors in fulfilling its oversight responsibilities with respect to: <ul style="list-style-type: none"> • quality and integrity of the Company's financial reporting and related financial disclosure; • the effectiveness of the Company's internal control over financial reporting and disclosure controls and procedures; • the Company's compliance with legal and statutory requirements as they relate to financial statements and related financial disclosures; • the Company's risk management and monitoring processes; and • the qualifications, performance and independence of the Company's independent auditors and performance of the internal audit function.
303A.08	Shareholders must be given the opportunity to vote on all equity-compensation plans and material revisions thereto, with limited exemptions set forth in the NYSE rules.	See "Corporate governance, management and employees—Corporate governance—Committees of our board of directors."
303A.09	A listed company must adopt and disclose corporate governance guidelines that cover certain minimum specified subjects.	Nexa's articles of association requires the approval of the shareholders on any equity-compensation plans.
303A.10	A listed company must adopt and disclose a code of business conduct and ethics for directors, officers and employees, and promptly disclose any waivers of the code for directors or executive officers.	We have published formal corporate governance guidelines.

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Section	NYSE corporate governance rule for U.S. domestic issuers	Our approach
303A.12	<p>(a) Each listed company CEO must certify to the NYSE each year that he or she is not aware of any violation by the company of NYSE corporate governance listing standards.</p> <p>(b) Each listed company CEO must promptly notify the NYSE in writing after any executive officer of the listed company becomes aware of any non-compliance with any applicable provisions of this Section 303A.</p> <p>(c) Each listed company must submit an executed Written Affirmation annually to the NYSE. In addition, each listed company must submit an interim Written Affirmation as and when required by the interim Written Affirmation form specified by the NYSE.</p>	As a foreign private issuer, we are subject to (b) and (c) of these requirements, but not (a).

MANAGEMENT

Board of directors

Our board of directors is responsible for the general guidance of our business and ensuring that we meet our objectives, as well as for monitoring our performance and ensuring business continuity. The board of directors is vested with broad powers to act on behalf of the Company and to perform or authorize all acts of administrative or ancillary nature necessary or useful to accomplish our corporate purpose. All powers not expressly reserved by law to the shareholders fall within the competence of our board of directors.

Our board of directors is comprised of a minimum of five and a maximum of eleven members and currently has nine members, of which four are independent directors and five are non-independent, as set out below. The non-independent directors are non-independent on the account of such directors either also being executive officers of the Company, its subsidiaries or its controlling shareholder, as applicable, or having been retained to provide consulting services to the Company. Our directors are appointed at the general meeting of our shareholders for a mandate of a one-year term and may be reelected. Members of our board of directors may be removed at any time, with or without cause, by a resolution adopted at a general meeting of our shareholders.

The following table sets forth our current directors, their respective board positions and their respective date of election to the board. Most of our current directors were elected when our articles of association provided for two-year terms for directors. Our articles of association provide that directors are appointed for terms not to exceed one year. The term of each and all of our directors expires at the next annual general meeting of shareholders in 2019.

Name	Age	Principal Residence	Position	Date of Election
Luís Ermírio de Moraes*	59	São Paulo, Brazil	Chairman of the Board	June 28, 2018
Daniella Dimitrov ^{(1)**}	49	Toronto, Canada	Director	June 28, 2018
João Henrique Batista de Souza Schmidt***	40	São Paulo, Brazil	Director	June 28, 2018
Eduardo Borges de Andrade Filho ^{(1)*}	52	São Paulo, Brazil	Director	June 28, 2018
Diego Hernandez C***	71	Vitacura, Chile	Director	June 28, 2018
Jean Simon	63	Quebec, Canada	Director	June 28, 2018
Edward Ruiz ⁽¹⁾⁽²⁾	69	São Paulo, Brazil	Director	June 28, 2018
Ivo Ucovich	75	Panamá Province, Panama	Director	June 28, 2018
Jane Sadowsky ^{(1)**}	57	New York City, USA	Director	June 28, 2018

(1) Independent pursuant to Rule 10A-3 under the Exchange Act (Rule 10A-3) and applicable NYSE standards, as well as National Instrument 52-110 and Section 311 of the TSX Company Manual.

(2) Edward Ruiz is a member of both the audit and finance committees.

* Member of the compensation, nomination and governance committee.

** Member of the audit committee.

*** Member of the finance committee.

The business address of each member of our board of directors is Nexa's corporate office, which is 37A, Avenue J.F. Kennedy, L-1855 Luxembourg, Grand Duchy of Luxembourg.

We present below a brief biographical description of each member of our board of directors:

Luís Ermírio de Moraes. Mr. Moraes has been a member and the Chairman of our board of directors since 2016. He has also been a member and the Chairman of the board of directors of Nexa Brazil since 2014. Mr. Moraes has over 35 years of experience working in mining and metallurgical operations. He is currently Vice President and a member of the board of directors of VSA, which is the Portfolio Manager Board of the Votorantim Group. Mr. Moraes is Chairman of CBA, the largest integrated aluminum producer in Brazil. He is a board member of Hejoassu, which is the ownership board of Votorantim. Mr. Moraes previous roles include director of VSA since 2000. Mr. Moraes also worked as an engineer in various processes in the areas of alumina refinery, smelter and aluminum

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smelting, pyrometallurgical and hydrometallurgical mineral processing of nickel laterites, developing novel projects for the separation and refining of cobalt. In the early 2000s, Mr. Moraes was the shareholder responsible for the creation and development of a new Votorantim business area with investments in IT and biotechnology. Mr. Moraes received a bachelor's degree in mineral and chemistry engineering from the Colorado School of Mines, in the state of Colorado, United States, in 1982.

Daniella Dimitrov. Ms. Dimitrov has been a member of our board of directors since January 2018. Ms. Dimitrov has over 20 years of leadership experience in building, leading and operating businesses in mining and financial services, including as CEO, COO and CFO. She is currently a partner at Sprott Capital Partners, a division of Sprott Capital Partners LP, a merchant bank with a focus on natural resources. Ms. Dimitrov is also a director of International Petroleum Corp. and Excellon Resources Inc. Ms. Dimitrov's previous roles include President and CEO and CFO of a multi-mine gold/copper producer; Executive Vice-Chair of an iron ore developer through its acquisition following a hostile take-over bid; COO of a Canadian national wealth management and capital markets firm; and various corporate development roles in mining and financial services. Ms. Dimitrov has been a director of various mining companies and has served as a member and chair of various board committees, including audit, technical, health and safety, compensation and governance. Ms. Dimitrov has a Global EMBA from Kellogg School of Management and Schulich School of Business and a law degree from University of Windsor. She was chosen as one of the top 100 Global Inspirational Women in Mining in 2016.

João Henrique Batista de Souza Schmidt. Mr. Schmidt has been a member of our board of directors since 2016. He is currently the Executive Director for Corporate Development at VSA, a position he has held since August 2014. He is the President of the Board of Directors of Votorantim Geração de Energia S.A., a position he has held since 2014 and was recently elected as President of the Board of Directors of CESP — Companhia Energética de São Paulo. He also serves as member of the Board of Directors of Citrosuco S.A. since 2014 and Nexa Brazil since 2016. Mr. Schmidt was previously a member of the board of directors of Fibria Celulose S.A. from 2014 to 2019. Prior to joining VSA, Mr. Schmidt had 15 years of experience in the financial sector. Mr. Schmidt was a Managing Director of Goldman Sachs do Brasil Banco Múltiplo S.A., where he worked from April 2010 to August 2014, and prior to that worked at Citigroup and Goldman Sachs in different capacities. Mr. Schmidt received a bachelor's degree in Business Administration from Fundação Getulio Vargas in 2001.

Eduardo Borges de Andrade Filho. Mr. Andrade has been a member of our board of directors since 2016. He has also been a member of the board of directors of Nexa Brazil and CBA since 2014 and 2017, respectively. Mr. Andrade has over 20 years of experience working with large industrial conglomerates and international consulting firms on relevant issues related to strategy, corporate development, corporate finance, governance and organization. He is founder and managing director of Otinga Investimentos, a private equity firm focusing on mid-size companies in Brazil. Between 2011 and 2014, he was corporate planning officer at VSA and served as board member of four other companies of the Votorantim Group. From 2010 to 2011, he was vice president for corporate development at Usiminas, a steel company, where he was responsible for mining and capital goods businesses, as well as strategy, business development and M&A. Prior to that, between 1997 to 2010, he was a Partner at McKinsey & Company, a consulting firm, where he took various leadership roles such as the Basic Materials Practice and the Knowledge Committee in Latin America. He started his professional career as an entrepreneur and engineer in his home state of Minas Gerais. Mr. Andrade received a bachelor's degree in civil engineering from Fundação Mineira de Educação e Cultura in 1991 and holds a MBA from the University of Chicago in 1995.

Diego Hernandez C. Mr. Hernández has been a member of our board of directors since 2016. He has also been a member of the board of directors of Nexa Brazil since 2014. Mr. Hernández has over 44 years of experience in the mining industry. He is currently the President of the Sociedad Nacional de Minería in Chile, Director of the Chilean Institute of Engineers and Advisor to the Chairman of BAL Group. He also integrates the Executive Committee of the Confederación de la Producción y del Comercio de Chile. He served as CEO of Antofagasta Minerals from August 2012, and in September 2014 was appointed CEO of Antofagasta plc, a position he held until April 2016. He was CEO of CODELCO in 2010/2012 and President of Base Metals in BHP Billiton and Chairman of Minera Escondida during 2004/2010, based in Santiago. He served as Executive Director, Non-Ferrous Metals in Vale in 2001/2004, CEO of Compañía Minera Doña Inés de Collahuasi in 1996/2001 and has held other senior positions in Anglo American and Rio Tinto. Mr. Hernandez received a civil mining engineer degree from the University of Chile and from the École Nationale Supérieure des Mines de Paris. In 2010, he received an award

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granted by the Copper Club of New York, and in 2013 the Chilean Institute of Engineers awarded him the “Gold Medal” for his distinguished career and important contribution to the development of engineering in Chile.

Jean Simon. Mr. Simon has been a member of our board of directors since 2016. He has also been a member of the board of directors of Nexa Brazil since 2014. He has over 33 years of professional experience in aluminum primary metals, bauxite and alumina and in strategy, business management, operations and R&D, labor negotiations and stakeholder management. Mr. Simon served as general manager of several facilities and as regional vice president and president of Primary Metal North America; then president for Rio Tinto Alcan Primary Metal, with operations in North America, Europe, Middle East and Africa. He is currently a board member of the Bank of Canada and a board member of Aluquebec, an aluminum cluster, which coordinates working groups within the Québec aluminum processing industry. Mr. Simon received a bachelor’s degree in physics engineering from Laval University in 1978 and a degree in Business Administration from the Université du Québec in 1982. He also graduated from the Directors Education Program in partnership with the Institute of Corporate Directors, the Mc Gill Executive Institute and the Rotman School of Management, University of Toronto in 2013.

Edward Ruiz. Mr. Ruiz has been a member of our board of directors since January 2018. Mr. Ruiz brings over 46 years of experience in public and private accounting. Mr. Ruiz currently serves on the audit committee of several publicly traded companies in Brazil, including Iochpe-Maxion SA and Arezzo & Co. He is a Certified Public Accountant since 1972 and has been responsible for audits of companies in the mining and energy sectors in Brazil and the United States. Mr. Ruiz retired from Deloitte in 2012, where he was employed since 1997 and most recently served as an audit partner and member of Deloitte’s IFRS specialist group. As head of the Capital Markets group for Deloitte, Mr. Ruiz advised companies on financial and regulatory reporting matters related to initial public offerings and secondary offerings in the Brazilian, United States and European capital markets. Prior to Deloitte, he held executive positions in internal audit at JP Morgan and PepsiCo in the United States. He started his career in public accounting with Arthur Young in 1971. Mr. Ruiz obtained his bachelor’s degree from Pace University, New York City in 1971.

Ivo Ucovich. Mr. Ucovich has been a member of our board of directors since 2016. Mr. Ucovich brings over 50 years of experience in mining and administration. Mr. Ucovich has been the Chairman of Nexa Peru’s board since 2002. He has served as Chairman of Nexa Resources Atacocha since 2008. He is also Director of Sociedad de Minería Petróleo y Energía and Comex Perú. He served as Director of Química Suiza until 2017. He received a bachelor’s degree in Metallurgical Engineering from Lafayette College in 1965.

Jane Sadowsky. Ms. Sadowsky has been a member of our board of directors since January 2018. Ms. Sadowsky has a broad and diverse range of finance and deal-related expertise and also has sector expertise in power and utilities and the related fields of commodities, renewables, power technology, infrastructure, and energy. She has a depth of knowledge and experience in mergers and acquisitions, public and private debt and equity, corporate restructurings and cross border transactions. Ms. Sadowsky retired from Evercore Partners, after more than 22 years as an investment banker. Prior to Evercore Partners, she worked in Citigroup’s Investment Bank and began her investment-banking career at Donaldson, Lufkin & Jenrette. Currently, Ms. Sadowsky serves on the board and the audit committee of Yamana Gold, a publicly traded gold mining company based in Toronto, Canada, and chairs Yamana’s governance committee. She also serves as a senior advisor with responsibility for diversity and inclusion at Moelis & Company, a U.S. publicly-traded company. Ms. Sadowsky earned her MBA from the Wharton School in 1989 and her bachelor’s degree in Political Science and International Relations from the University of Pennsylvania in 1983. She is a National Association of Corporate Directors Governance Fellow and a frequent speaker at board governance conferences throughout the United States.

Share ownership

Luis Ermírio de Moraes, the chairman of our board of directors, indirectly owns 2,379,071, or 1.78%, of our common shares. Ivo Ucovich, a member of our board of directors, indirectly owns 4,955,058, or 3.72%, of our common shares. Mr. Ucovich was appointed by our shareholders to our board of directors pursuant to a shareholders’ agreement among Nexa Resources and its existing shareholders. This shareholders agreement ceased to be in effect prior to consummation of our initial public offering. As of December 31, 2018, none of our executives own, beneficially or of record, any of our common shares.

EXECUTIVE OFFICERS AND MANAGEMENT COMMITTEE**Executive officers**

We have global executives and management teams for our main subsidiaries. Each subsidiary team has a management structure that adheres to our corporate governance rules. Our executives currently are as follows:

Name	Age	Principal Residence	Position
Tito Botelho Martins Junior	56	São Paulo, Brazil	President and Chief Executive Officer
Rodrigo Nazareth Menck	44	São Paulo, Brazil	Senior Vice President Finance and Group Chief Financial Officer
Mauro Davi Boletta	58	São Paulo, Brazil	Senior Vice President Smelting
Leonardo Nunes Coelho	41	Lima, Peru	Senior Vice President Mining
Valdecir Aparecido Botassini	58	São Paulo, Brazil	Senior Vice President Project Development & Execution
Jones Aparecido Belther	51	São Paulo, Brazil	Senior Vice President Mineral Exploration & Technology
Felipe Baldassari Guardiano	56	São Paulo, Brazil	Vice President Sustainability & Strategic Planning
Arlene Heiderich Domingues	55	São Paulo, Brazil	Vice President Human Resources & Corporate Affairs
Ricardo Moraes Galvão Porto	45	Lima, Peru	Senior Vice President Commercial & Supply Chain

The business address of our executives is 37A, Avenue J. F. Kennedy, L-1855 Luxembourg, Grand Duchy of Luxembourg.

A brief biographical description of each of our executives is presented below:

Tito Botelho Martins Junior. Mr. Martins has been our Chief Executive Officer since 2012. Mr. Martins has more than 30 years of experience in the metals and mining industry, and extensive board experience in different countries. Currently he serves on the board of CBA, as well as Nexa Peru and Nexa Resources Atacocha S.A.A., which are both listed in the Peruvian Stock Exchange. In 2014 and 2015, he was Chairman of the Board of the Brazilian Aluminum Association (ABAL). Prior to joining Nexa Resources, Mr. Martins was Executive Director for Base Metals at Vale S.A., a leading Brazilian mining company, from 2006 to 2012. During this period, he also served as board member of Norsk Hydro, an aluminum producer listed in Norway. He was also a member of the Brazilian Mining Institute. From 2003 to 2006, Mr. Martins was the CEO of Caemi S.A., a Brazilian diversified mining company listed on the São Paulo Stock Exchange. Earlier in his career, he worked for Vale S.A., from 1985 to 2003, where he held several positions in the finance and corporate areas. He graduated with a degree in Economics in 1984 from Universidade Federal de Minas Gerais in Brazil and has an MBA in 1984 from the Instituto de Pesquisa Económica e Administrativa of Universidade Federal do Rio de Janeiro, Brazil. In May 2017, the newspaper Valor Econômico recognized Mr. Martins as the Valor Executive of the mining and metallurgy sector.

Rodrigo Nazareth Menck. Mr. Menck has been our Senior Vice President Finance and Group Chief Financial Officer since March 2019. Mr. Menck has more than 20 years of experience in treasury, structured finance and capital markets. He joined Nexa Resources in 2016 as Head of Treasury & Investor Relations. He was also directly involved in Nexa Resources' initial public offering in 2017 as well as Nexa Resources' first debt issuance in May 2017. Prior to joining Nexa Resources, Mr. Menck held positions at BankBoston Corp., Itau Unibanco Holding S.A., WestLB A.G., Citibank and BNP Paribas S.A. He also worked at Braskem S.A. as a Structured Finance Manager and Finance and Shared Services Director and at Construtora Norberto Odebrecht S.A., as Head of Risk, Investments & Structured Finance (Latin America). Mr. Menck holds a degree in Business Administration and an MBA from the University of São Paulo, Brazil.

Mauro Davi Boletta. Mr. Boletta has been our Senior Vice President Smelting since 2016. Mr. Boletta has over 30 years of experience with operations. He joined Votorantim Metais S.A. in 1986, having served in several

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Executive Officers and Management Committee

production areas. Between 2010 and 2011, he was responsible for the design review of an aluminum smelter in Trinidad and Tobago. Mr. Boletta graduated with a degree in electrical engineering from the Federal University of Itajubá, UNIFEI in 1985 and holds an MBA from FGV.

Leonardo Nunes Coelho. Mr. Coelho has been our Senior Vice President Mining since 2017. Mr. Coelho has over 17 years of experience managing mining operations with focus at gold and zinc. Prior to joining us, Mr. Coelho worked for Anglo Gold Ashanti Ltd. for 15 years, where he initiated his career as a Trainee. In Anglo Gold Ashanti Ltd., Mr. Coelho has led mining operations and the expansion of mining projects and served as General Manager of the Cuiabá and Lamego complexes as his last position at this company. Mr. Coelho graduated with a degree in Mine Engineering in 2001 from the Federal University of the State of Minas Gerais (UFMG), and has obtained graduate degrees from the Kellogg Graduate School of Management in 2015 in the United States, the Dom Cabral Foundation in 2009 in Brazil and the University of Cape Town in 2005 in South Africa as well as a qualification at INSEAD in digital transformation in 2018.

Valdecir Aparecido Botassini. Mr. Botassini has been our Senior Vice President Project Development & Execution since 2016. He joined Votorantim Metais S.A. in 1985. Mr. Botassini held several leadership positions between 1985 and 2016, serving as General Manager of Mining and Metallurgy Operations, Nickel Business Director, Zinc Business Director and Polymetallic Operations Director. Mr. Botassini graduated with a degree in mechanical engineering from Universidade Presbiteriana Mackenzie in Brazil and holds a specialization certificate in Process Engineering from the Escola Politécnica of the University of São Paulo, USP. He also attended the STC program at the Dom Cabral Foundation in Brazil, in partnership with the Kellogg School of Management in the United States.

Jones Aparecido Belther. Mr. Belther has been our Senior Vice President Mineral Exploration & Technology since 2014. He has over 28 years of experience in the area. He held the same position at Votorantim Metais S.A. between 2004 and 2014. Prior to joining us, he was country manager at Vale in Peru between 2002 and 2004. He has worked in Brazil and abroad in companies such as Rio Tinto Brasil, Golden Star Resources, in Suriname, Phelps Dodge in Brazil and Chile, Vale in Brazil and Peru, and other companies. Mr. Belther graduated with a degree in Geology in 1991 from the São Paulo State University, UNESP, in Brazil, where he also obtained a Master's degree in 2000 in Mineral Exploration.

Felipe Baldassari Guardiano. Mr. Guardiano has been our Vice President Sustainability & Strategic Planning since 2014. Prior to that, he served as Director of Performance Management at Votorantim Metais S.A. between 2012 and 2014. He is responsible for developing and implementing company policies for sustainability and coordinating the elaboration and implementation of the company strategic plan. In addition, he is responsible for establishing targets for performance improvement at all operations and corporate divisions through the development and implementation of the Votorantim Performance Management System. In 2012, before joining Votorantim Metais S.A., he worked at Vale for seven years as Director of Performance Management and, later, as a Director of Pellet Plants. Prior to Vale, he worked as a consultant, serving as an engagement manager associate at McKinsey & Co. for approximately five years. Prior to 1999, he lived in the United States for 12 years, where he worked as a Geostatistician and Reserve Specialist for Mineral Resources Development Inc., or MRDI. While at MRDI, he provided advisory expertise on mines in the United States, Canada, Africa, Brazil, Australia, Chile and other countries. Mr. Guardiano graduated in Mining Engineering from the Ouro Preto School of Mines (Minas Gerais, Brazil), and holds a Master's degree in Mining Engineering from the Montana College of Mineral Sciences and Technology (Butte, Montana, United States), as well as executive education program certificates from the Massachusetts Institute of Technology (Boston, Massachusetts, United States), and the IMD (Lausanne, Switzerland).

Arlene Heiderich Domingues. Ms. Domingues has been our Vice President Human Resources & Communications since 2013. Since 2017, she has also been in charge of Corporate Affairs at Nexa Resources. She held the same position at Votorantim Metais S.A. between 2013 and 2016. Prior to that, she built her 22 year career at Bosch, where she had the opportunity to work at Bosch, in Stuttgart, Germany for two years, acting in a global function, as executive and organizational development. Ms. Domingues graduated with a degree in business administration in 1990 from FIIB in Brazil and completed a controlling specialization course in 1998 from FGV.

Ricardo Moraes Galvão Porto. Mr. Porto has been our Senior Vice President Commercial and Supply Chain since July 2018. His previous position was as Vice President Commercial and Supply Chain at Nexa, a

position he held since 2014. Mr. Porto has also been Chief Executive Officer at Nexa Peru since November 2017. Mr. Porto held a management position at Votorantim Metais S.A. between 2013 and 2014. Mr. Porto began its career as commercial manager at Esso do Brasil, an Exxon Mobil affiliate. Prior to joining Votorantim Metais S.A., from 2004 until 2012, Mr. Porto worked in several senior management positions as supply chain executive at Vale S.A., reaching the position of officer Procurement Director. After, served as Executive Officer at the Bravante Group, an oil & gas company. Mr. Porto graduated with a degree in chemical engineering from the Federal University of Rio de Janeiro, UFRJ, and holds an Executive MBA from Fundação Dom Cabral. He has also obtained executive education program certificates from the Massachusetts Institute of Technology, and Kellogg Graduate School of Management in the United States and the IMD in Switzerland.

Evaluation of executive officers

On an annual basis, the performance of our executive officers is evaluated by the chief executive officer, the compensation, nomination and governance committee and ultimately, the board of directors. We strive to create a strong ethical and high performance culture, as well work to ensure an appropriate succession plan that ensures the continuity of our business. In addition to future business needs, we consider the core skills, experience and diversity necessary to carry out our strategy.

Each year, our chief executive officer presents to the board of directors a report on potential successors to his position, which considers the ability of succession candidates to succeed the chief executive officer in an emergency, on an interim or permanent basis, as well as critical experiences and other attributes required in order for each candidate to enhance his or her readiness for succession. Our board of directors discusses potential successors with the chief executive officers, as well as potential successors to each member of the management team.

Position descriptions

Our board of directors has developed position descriptions for each of the chief executive officer and chief financial officer, which are discussed below.

Chief executive officer

Our board of directors believes that our chief executive officer must have experience in, among other things: leading businesses of a similar complexity and scale; carrying out growth and value creation mandates; participating in mergers and acquisitions; articulating and executing long-term corporate strategies; and facilitating development within high-achieving organizations. In addition, our board of directors expects our chief executive officer to have knowledge of the mining and metals industry, international experience and an extensive global network. According to our board of directors, our chief executive officer should possess the following attributes, among others: a hands-on approach to the business; an alignment with our values; resiliency and credibility; a good reputation within the market; and the ability to communicate with and influence stakeholders.

Chief financial officer

Our board of directors believes that our chief financial officer must have experience in, among other things: leading accounting, controllership, financial planning and analysis, investor relations, treasury matters, mergers and acquisitions and risk management activities; formulating a company's plan and direction for the future; developing financial, operational and tax-related strategies; managing transactions; overseeing internal controls in compliance with applicable laws and regulations; and implementing all financial-related activities within a company. In addition, our board of directors expects our chief financial officer to have public company experience, strong analytical and business valuation skills, knowledge of national securities exchanges, such as the NYSE and TSX, international experience and an extensive global network. According to our board of directors, our chief financial officer should possess the following attributes, among others: a hands-on approach to the business; an alignment with our values; resiliency and credibility; a good reputation in the market; and the ability to communicate with and influence stakeholders.

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Executive Officers and Management Committee

Management committee

In accordance with our articles of association, the board of directors may delegate its powers to conduct our management and affairs, as well as its representation of us with respect to such matters, to a management committee. The management committee consists of at least three, and a maximum of seven, members. The members are not required to be shareholders or directors of the Company. The board of directors may not delegate its powers related to general guidance of our business or acts reserved to the board of directors pursuant to the 1915 Law.

The following table sets forth the members of our management committee, and their respective positions as of December 31, 2018. The term of the members of our management committee expires on August 17, 2019.

Name	Age	Principal Residence	Position
Tito Botelho Martins Junior	56	São Paulo, Brazil	Chief Executive Officer
Rodrigo Nazareth Menck	44	São Paulo, Brazil	Senior Vice President Finance and Group Chief Financial Officer
Mauro Davi Boletta	58	São Paulo, Brazil	Senior Vice President Smelting
Leonardo Nunes Coelho	41	Lima, Peru	Senior Vice President Mining
Valdecir Aparecido Botassini	58	São Paulo, Brazil	Senior Vice President Project Development & Execution
Jones Aparecido Belther	51	São Paulo, Brazil	Senior Vice President Mineral Exploration & Technology
Ricardo Moraes Galvão Porto	45	Lima, Peru	Senior Vice President Commercial & Supply Chain

Family relationships among executives

Our executives do not have any family relationships among themselves or with any other of our employees.

EXECUTIVE AND DIRECTOR COMPENSATION

The following discussion describes the significant elements of the compensation of our executive officers and directors for the year ending December 31, 2018.

In 2018 our executive compensation program includes cash compensation in the form of base salary, short-term incentives and long-term incentives. We provide base salary to compensate executives for their day-to-day responsibilities, which is aligned to a market reference based on industry analysis. We evaluate our total compensation practices on an annual basis to ensure that our compensation remains competitive in light of market and industry trends.

Our compensation, nominating and governance committee is responsible for assisting our board of directors in fulfilling its governance and supervisory responsibilities, and advising our board of directors with respect to evaluation and monitoring of compensation models and policies and other related matters. The committee's responsibilities also include administering and determining our compensation objectives and programs, reviewing and making recommendations to our board of directors concerning the level and type of the compensation payable, evaluating performance, implementing evaluation and improvement processes, and ensuring that policies and processes are consistent with our philosophy and the objectives of our compensation program.

Compensation framework

Our compensation is comprised of three principal components: (i) base salary, (ii) short-term incentive and (iii) long-term incentive.

Principal elements of compensation

Base salary

Base salaries for executive officers are established based on the scope of their responsibilities and competencies, and taking into consideration the median market reference. Adjustments to base salaries are expected to be determined annually and may be increased based on performance, as well as to maintain market competitiveness. Additionally, base salaries may be adjusted as warranted throughout the year to reflect promotions or other changes in the scope or breadth of roles or responsibilities.

Short-term incentive program / bonuses

The annual bonus or short-term incentive program aims to align short-term priorities with the Company's strategic planning by rewarding achievement of our goals and targeted annual results, resulting in an alignment with the interests of the Company. Each named executive officer has a panel of individual goals, with scales of minimum performance, target and surpass results. Measurement in these panels is based on financial and non-financial indicators. These indicators represent the specific goals and challenges attributable to the position in alignment with the Company's performance and strategic planning.

Financial indicators are based on internal metrics and represent up to 60.0% of the individual panel. In 2018 the metrics used were EBITDA and free cash flow.

Strategic goals represent up to 40.0% of the individual panel and are comprised of qualitative and quantitative factors. In 2018, the metrics used in this assessment included performance targets related to cash cost, production volume, cost, safety and reserves and resources.

Long-term incentive program

Our long-term incentive (or LTI) program is designed to provide strong incentives for making decisions with a view to creating value for shareholders by linking cash compensation to the Company's long-term performance, and by guiding executive actions towards the achievement of our strategic goals and growth plans.

The LTI program aligns interests among our executives and shareholders to ensure continued value creation. This incentive system is also intended to engage management in developing and delivering a consistent strategic plan, as well to attract and retain executive officers.

The LTI program is based on a five-year vesting period and comprised of two parts, base grant and supplementary grant. The base grant is a defined amount approved by the board of directors to be paid out at the end of the five-year vesting period. This amount appreciates according to the total shareholder return (TSR) over the vesting period. The supplementary grant is also a defined amount to be paid out at the end of the five-year vesting period. The payment of the supplementary grant is based on a targeted Company TSR combined with a performance curve, both approved by our board of directors at each granting period. The performance curve determines the amount to be paid in case of a performance equal or lower than expected in the targeted TSR. If the targeted TSR is achieved, the payment is fully due. If the performance of the TSR is greater than expected, the supplementary grant to be paid will be adjusted accordingly.

The methodology is referenced to the market value of the Company's shares at the end of the vesting period, calculated based on the weighted average price of the common shares during the months of October, November and December in the year immediately prior to the year in which the respective settlement date for the award occurs, together with dividends paid during the respective grant cycle.

Short selling

According to our insider trading policy, directors and officers must refrain from active or speculative trading involving the Company's securities based on short-term fluctuations in the price of the Company's securities or other market conditions. This includes, but is not limited to, short sales, trading in puts, calls or options or similar rights or obligations to buy or sell the Company's securities or derivative securities relating to the Company's securities, and the purchase of the Company's securities with the intention of quickly reselling them. In addition, directors and officers may not purchase financial instruments, such as prepaid variable forward contracts, equity swaps or collars, designed to hedge or offset a decrease in the market value of the Company's securities.

2018 executive compensation

During fiscal year 2018, our executive officers received cash compensation in an aggregate amount of approximately US\$6,352,450. The following table summarizes compensation we paid to our executive officers during the fiscal year 2018, including base salary, short-term incentive programs or bonuses, long-term incentive programs and pension value.

Name and Title	Non-equity Incentive Plan Compensation				Total Compensation (US\$)
	Base Salary (US\$)	Short-term incentive programs / bonuses (US\$)	Long-term incentive programs (US\$)	Pension Value (US\$)	
Tito Botelho <i>Chief Executive Officer</i>	756,784	572,425	462,321	45,163	1,836,693
Mario Bertoncini(1) <i>Senior Vice President Finance & Group Chief Financial Officer</i>	340,011	387,491	148,017	2,072	877,592
Mauro Davi Boletta <i>Senior Vice President Smelting</i>	209,339	65,806	—	11,432	286,577
Leonardo Nunes Coelho <i>Senior Vice President Mining</i>	258,557	127,628	—	14,303	400,488
Valdecir Botassini <i>Senior Vice President Project Development & Execution</i>	292,978	248,274	120,917	15,947	678,116
Jones Aparecido Belther <i>Senior Vice President Mineral Exploration and Technology</i>	229,390	379,911	82,976	12,486	704,762
Arlene Heiderich Domingues <i>Vice President Human Resources & Corporate Affairs</i>	223,700	76,655	80,844	12,068	393,268
Ricardo Porto <i>Senior Vice President Commercial & Supply Chain</i>	376,513	190,261	65,547	12,661	644,981
Felipe Guardiano <i>Vice President Sustainability & Strategic Planning</i>	219,415	220,544	78,191	11,825	529,974

(1) Mario Bertoncini was succeeded by Rodrigo Nazareth Menck as Senior Vice President Finance and Group Chief Financial Officer on March 1, 2019.

In 2018, the investment program was discontinued. Some of the compensation previously associated with this program has been incorporated into the short-term incentive program, while a portion will be valued annually as part of the long-term incentive grant.

2018 director compensation

During fiscal year 2018, our directors received total compensation in an aggregate amount of US\$1,911,000 for their services as members of our board of directors. The chairman of our board of directors received US\$240,000 in annual fees, while each board member received US\$200,000. In addition, each director is entitled to reimbursement for reasonable travel and other expenses incurred in connection with attending board meetings and meetings for any committee on which he or she serves.

We have no service contracts with members of our board of directors providing for benefits upon termination of employment.

Annual compensation levels for the directors are as set out below:

Name	Fees earned (US\$)	Total Compensation
Luís Ermírio de Moraes	240,000	240,000
Daniella Dimitrov ⁽¹⁾	222,000	222,000
Diego Hernandez	200,000	200,000
Eduardo Andrade	200,000	200,000
Edward Ruiz ⁽¹⁾	227,000	227,000
Jean Simon	200,000	200,000
João Schmidt	200,000	200,000
Jane Sadowsky ⁽¹⁾	222,000	222,000
Ivo Ucovich	200,000	200,000

(1) The audit committee members are entitled to additional compensation of US\$10,000.00 per year. The chair of the audit committee is entitled to additional compensation of US\$15,000.00 per year. All members also receive an extra fee of US\$1,500.00 per meeting attended.

Compensation consultants

The Company retained Korn Ferry as compensation advisors in 2018 to provide competitive market analysis to assist in determining the appropriate level of compensation for executives. Korn Ferry has over 40 years of experience and deep knowledge in the Brazilian market. Korn Ferry was asked to provide comprehensive competitive market clearing information on incentives, policies and benefits for each executive position. The Company paid Korn Ferry US\$23,676.93 in consulting services fees in 2018.

Nexa used survey reports compiled by the Bedford Consulting Group to assist in considerations related to board compensation. The Bedford Consulting Group's mining industry reports offer in-depth analysis to support

mining companies in benchmarking executive and director compensation practices relative to peer group competitors.

Retirement benefit plans

All executive officers participate in the Fundação Senador José Ermírio de Moraes, or FUNSEJEM, pension fund, a private, closed and not-for-profit pension fund responsible for the management of the pension plans for the employees of the companies that are linked with the Votorantim group.

The pension plan is a defined contribution plan. Participation is voluntary and thus supplemental to the Brazilian government's mandatory social security system. The plan is offered to employees through a specific fund that is maintained separately from the funds of each of the sponsoring organizations.

The plan's assets correspond to 100% of the value of the liabilities. Annually, an actuarial assessment is made in compliance with the current legislation. However, there is no risk of deficit, since it is a defined contribution plan, whose formation of the reserve results from the capitalization of the respective contributions to the plan.

An employee may choose to contribute between 0.5% and 6% of his or her base wage. Nexa also matches the contribution made by the participant depending on such participant's salary.

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Employees

EMPLOYEES

As of December 31, 2018, we had 5,591 employees and 6,755 independent contractors. The following tables show the number of employees and contractors as of December 31, 2018, 2017 and 2016.

Number of Employees

	As of December 31,		
	2018	2017	2016
Brazil	3,198	3,163	3,110
Peru	2,367	2,254	2,241
United States, Austria and Luxembourg	26	29	36
Total	5,591	5,446	5,387

Number of Independent Contractors

	As of December 31,		
	2018	2017	2016
Brazil	1,181	1,026	912
Peru	5,574	5,856	6,029
Total	6,755	6,882	6,941

Most of our employees are represented by labor unions. We negotiate collective bargaining agreements, relating to salaries, working conditions and welfare, with the various unions that represent our employees. Although we believe our present labor relations are good, there can be no assurance that a work slowdown, stoppage or strike will not occur prior to or upon the expiration of the current collective bargaining agreements, and we are unable to estimate the effect of any such work slowdown, stoppage or strike on our production levels, in spite of an established contingency plan. In November 2018, we experienced a five-day labor strike in Cerro Lindo, which ended after reaching an agreement with the workers. The strike involved less than 10% of Cerro Lindo's work force and did not affect our production. Interactions between the Company and the labor unions are carried out by members of our human resources area, consistent with market practice.

We regularly invest in programs that ensure employee development and meet our specific business needs while continuously enhancing the qualifications of our staff so as to maintain and reinforce our competitiveness and our know-how as we continue to grow. The training programs include Technical/Operative Trainings, Mentoring Program, Leadership Development Program, Young Professional Training and an Individual Development Plan that, among other things, indicates the training that a given employee requires in order to continue to grow within Nexa Resources. In addition, we have a Trainee Program and the Academy of Excellence, a program created by Votorantim for leaders within Votorantim.

V. ADDITIONAL INFORMATION**LEGAL PROCEEDINGS**

As of December 31, 2018, we were party to various legal and administrative proceedings relating to labor, civil, environmental and tax matters in which the disputed amount for probable and possible claims was an aggregate of approximately US\$343.8 million. It is our policy to make provisions for legal contingencies when, based upon our judgment and the advice of our legal counsel, the risk of loss is probable. As of December 31, 2018, we had established a net provision in the amount of US\$30.6 million to cover contingencies for proceedings for which the risk of loss was deemed probable.

The following tables summarize judicial and administrative proceedings to which we are a party, the amounts in dispute in these proceedings in which a loss is considered probable or possible and the aggregate amount of the net provision established for losses that may arise from these proceedings.

	As of December 31, 2018	
	Total Proceedings ⁽¹⁾	Total Net Provisions ⁽²⁾
	(in millions of US\$)	
Civil and other proceedings ⁽³⁾	147.0	6.4
Tax judicial and administrative proceedings	151.3	12.1
Labor judicial and administrative proceedings	45.5	12.1
Total	343.8	30.6

(1) Does not include claims with expectation of loss classified as remote.

(2) Net of judicial deposits.

(3) Includes environmental legal and administrative proceedings.

Civil and environmental liabilities and contingencies

As of December 31, 2018, we were party to civil and environmental judicial and administrative proceedings, with a probable or possible chance of loss in the aggregate amount of US\$147.0 million, for which we have recorded a net provision in the amount of US\$6.4 million for proceedings with probable losses. The civil and environmental judicial claims filed against us primarily relate to pollution and collection lawsuits, repossession actions and indemnity actions related to contract disputes.

Tax liabilities and contingencies

As of December 31, 2018, we were party to tax-related judicial and administrative proceedings, with a probable or possible chance of loss in the aggregate amount of US\$151.3 million, for which we have recorded a net provision in the amount of US\$12.1 million for proceedings with probable losses.

The tax-related judicial and administrative claims filed against us primarily relate to (1) value added tax on sales and on transportation and telecommunication services (2) corporate income tax and social contribution on net profit, (3) CFEM, (4) PIS (*Programa de Ingração Social*) and (5) COFINS (*Contribuição para o Financiamento da Seguridade Social*).

Labor liabilities and contingencies

As of December 31, 2018, we were party to labor-related judicial and administrative proceedings, with a probable or possible chance of loss in the aggregate amount of US\$45.5 million, for which we have recorded a net provision in the amount of US\$12.1 million for proceedings with probable losses. The labor-related judicial and administrative claims filed against us primarily relate to (1) overtime payments, (2) health and safety conditions and (3) outsourcing and subcontracting certain activities.

ARTICLES OF ASSOCIATION

Company objectives and purposes

We were incorporated in Luxembourg as a public limited liability company (*société anonyme*) on February 26, 2014. Our articles of association provide that our corporate purpose is to, among others, (i) take participations and interests, in any form whatsoever, in any commercial, industrial, financial or other, Luxembourg or foreign companies or enterprises; (ii) acquire through participations, contributions, underwriting, purchases or options, negotiation or in any other way any securities, rights, patents and licenses and other property, rights and interest in property as we shall deem fit; (iii) generally to hold, manage, develop, sell or dispose of the same, in whole or in part, for such consideration as Nexa Resources may deem fit, and in particular for shares or securities of any company purchasing the same; (iv) enter into, assist or participate in financial, commercial and other transactions; (v) grant to any holding company, subsidiary or sister company, or any other company that belong to the same group as Nexa Resources, any assistance, loans, advances or guarantees (in the latter case, even in favor of a third-party lender of any affiliates); (vi) borrow and raise money in any manner and to secure the repayment of any money borrowed; (vii) to carry out any trade, business or commercial activities whatsoever, including, but not limited to, the purchase, exchange and the sale of goods and/or services to third parties; and (viii) generally to do all such other things as may appear to Nexa Resources to be incidental or conducive to the attainment of the above objects or any of them. We can perform all commercial, technical and financial operations, connected directly or indirectly in all areas as described above, in order to facilitate the accomplishment of its purpose, provided always that Nexa Resources will not enter into any transaction that would constitute a regulated activity of the financial sector without due authorization under Luxembourg law.

Our common shares are governed by Luxembourg law and our articles of association. The following is a summary of the material terms of our common shares based on our articles of association and Luxembourg law. These rights may differ from those typically provided to shareholders of U.S. companies under the corporation laws of some states of the United States. We encourage you to read the complete form of our articles of association.

Common shares

On July 1, 2014, our shareholders approved the issuance of 998,503,863 new common shares fully paid through contributions in cash, increasing our capital from €998,503,863 to €998,534,863. VSA contributed 99.93% and minority shareholders contributed 0.06%.

On July 27, 2015, our shareholders approved the issuance of 84,000 new common shares fully paid via contributions in cash by VSA, increasing our capital by US\$84,000, from US\$1,280,421,254 to US\$1,280,505,254.

On April 11, 2016, our shareholders approved the reduction of our share capital through the cancellation of 350,000,000 common shares, decreasing our share capital from US\$1,280,505,254 to US\$930,505,254.

On April 19, 2016, our shareholders approved the issuance of 110,910,811 new common shares fully paid via cash contributions by certain shareholders, increasing our capital from US\$930,505,254 to US\$1,041,416,065.

On June 28, 2017, our shareholders approved the reduction of our share capital through the cancellation of 200,000,000 common shares, decreasing our share capital from US\$1,041,416,065 to US\$841,416,065.

On September 18, 2017, our shareholders approved the reduction of our share capital through the cancellation of 300,000,000 common shares, decreasing our share capital from US\$841,416,065 to US\$541,416,065.

On October 6, 2017, our shareholders approved the reduction of our share capital through the cancellation of 428,595,552 common shares, decreasing our share capital from US\$541,416,065 to US\$112,820,513.

On October 31, 2017, our shareholders approved the issuance of 20,500,000 new common shares fully paid via cash contributions by certain shareholders, increasing our share capital from US\$112,820,513 to US\$133,320,513.

On September 13, 2018, our shareholders approved a general authorization to the board of directors to establish share buyback programs. On September 20, 2018, our board of directors approved a share buyback program under which we, directly or indirectly through our subsidiaries, may repurchase, from time to time, up to US\$30.0 million of our outstanding common shares listed on the New York Stock Exchange over a 12-month period beginning on November 6, 2018 and ending on November 6, 2019. As of March 25, 2019, we have repurchased 466,231 common shares, at an average price of US\$10.63 per share, for an aggregate purchase price of US\$4.96 million. All of the repurchased common shares have not been cancelled and are held in treasury.

As of December 31, 2018, our issued share capital was US\$133,320,513 represented by 133,320,513 common shares fully paid, with par value of US\$1.00 per share. In addition to our issued share capital, we have an authorized share capital of US\$231,924,819, represented by 231,924,819 common shares.

Distributions

Pursuant to our articles of association, the general meeting of shareholders may approve dividends and the board of directors may declare interim dividends, in each case to the extent permitted by Luxembourg law. Pursuant to our articles of association, the board of directors may also declare distributions to our shareholders in the form of reimbursement of share premium to the extent permitted by Luxembourg law. Under Luxembourg law, distributions (including in the form of dividends or share premium reimbursement) may be lawfully declared and paid if our net profits and/or distributable reserves, as set forth in our standalone statutory accounts prepared under Luxembourg GAAP, are sufficient under Luxembourg law.

The amount of a distribution to shareholders (including in the form of dividends or reimbursement of share premium) may not exceed the amount of profits at the end of the last financial year plus any profits carried forward and any amounts drawn from reserves available for that purpose, less any losses carried forward and sums to be allocated to non-distributable reserves in accordance with Luxembourg law or the articles of association. Furthermore, no distributions (including in the form of dividends or reimbursement of share premium) may be made if at the end of the last financial year the net assets as set out in the standalone statutory accounts prepared under Luxembourg GAAP are, or following such a distribution would become, less than the amount of the subscribed share capital plus the non-distributable reserves. Distributions in the form of dividends may only be made out of net profits and profits carried forward, whereas distributions in the form of share premium reimbursements may only be made out of available share premium.

Each common share entitles the holder to participate equally in any distributions, if and when declared by the general meeting of shareholders or, in the case of interim dividends or reimbursements of share premium, the board of directors, out of funds legally available for such purposes.

In accordance with Luxembourg law, each year at least 5.0% of the net profits must be allocated to the creation of a legal reserve that is not available for distribution. This allocation ceases to be compulsory when the reserve has reached an amount equal to 10.0% of the share capital, but is again compulsory if the reserve falls below such 10.0%. As of December 31, 2018 the legal reserve is zero.

Declared and unpaid distributions held by us for the account of the shareholders shall not bear interest. Under Luxembourg law, claims for unpaid distributions will lapse in our favor five years after the date such distribution has been declared.

For additional information regarding our policy on distributions, see "Share ownership and trading—Distributions."

Voting rights

There are no restrictions on the rights of Luxembourg or non-Luxembourg residents to vote our shares. All of our shareholders, including our public shareholders, hold common shares with identical voting rights, preferences and privileges. Each common share entitles the shareholder to attend a general meeting of shareholders in person or by proxy, to address the general meeting of shareholders and to vote. Each common share entitles the holder to one vote at the general meeting of shareholders.

The board of directors may also decide to allow shareholders to vote by correspondence by means of a proxy form providing for a positive or negative vote or an abstention on each agenda item. The conditions for voting by correspondence are set out in the articles of association and in the convening notice.

The board of directors may decide to arrange for shareholders to be able to participate in the general meeting by conference call, video conference or similar means of communication, whereby (i) the shareholders attending the meeting can be identified, (ii) all persons participating in the meeting can hear and speak to each other, (iii) the transmission of the meeting is performed on an ongoing basis and (iv) the shareholders can properly deliberate without the need for them to appoint a proxyholder who would be physically present at the meeting.

General meeting of shareholders

In accordance with Luxembourg law and our articles of association, any regularly constituted general meeting of our shareholders has the power to order, carry out or ratify acts relating to the operations of the Company to the extent that such decisions are the domain of the shareholders and not the board of directors.

Our annual general meeting of shareholders shall be held at our registered office, or at such other place in Luxembourg as may be specified in the notice of the meeting, within six months after the end of the relevant financial year. Except as otherwise specified in our articles of association, resolutions at a general meeting of shareholders are adopted by a simple majority of shares present or represented and voting at such meeting.

A shareholder entitled to vote may act at any general meeting of shareholders by appointing another person (who need not be a shareholder) as his proxy, which proxy shall be in writing and comply with such requirements as determined by our board with respect to the attendance to the general meeting, and proxy forms in order to enable shareholders to exercise their right to vote. All proxies must be received by us (or our agents) no later than the day determined by our board of directors.

If we decide to issue new shares in the future and do not exclude the preferential subscription rights of existing shareholders, we will publish the decision by placing an announcement in the Luxembourg official journal *Recueil Electronique des Sociétés et Associations* and in a newspaper published in Luxembourg. The announcement will specify the period in which the preferential subscription rights may be exercised and such period may not be shorter than 14 days from the publication of the offer. The announcement will also specify details regarding the procedure for exercise of the preferential subscription rights. Under Luxembourg law preferential subscription rights are transferable and tradable property rights.

Issuance of shares and preferential subscription rights

Our shares may be issued pursuant to a resolution of the general meeting of shareholders. The general meeting of shareholders may also delegate the authority to issue shares to the board of directors for a renewable period of five years. The board of directors has been authorized to issue up to 231,924,819 common shares. Such authorization will expire five years after the date of the general meeting of shareholders held on August 11, 2017 (unless amended or extended by the general meeting of shareholders).

Each holder of shares has preferential subscription rights to subscribe for any issue of shares pro rata to the aggregate amount of such holder's existing holding of the shares. Each shareholder shall, however, have no preferential subscription right on shares issued for a contribution in kind.

Preferential subscription rights may be restricted or excluded by a resolution of the general meeting of shareholders, or by the board of directors if the shareholders so delegate. The general meeting of shareholders has delegated to the board of directors the power to cancel or limit the preferential subscription rights of the shareholders when issuing new shares, so long as the issuance of new shares is carried out through a public offering.

If we decide to issue new shares in the future and do not exclude the preferential subscription rights of existing shareholders, we will publish the decision by placing an announcement in the Luxembourg official journal *Recueil Electronique des Sociétés et Associations* and in a newspaper published in Luxembourg. The announcement will specify the period in which the preferential subscription rights may be exercised. Such period may not be shorter than 14 days from the publication of the offer. The announcement will also specify details regarding the

procedure for exercise of the preferential subscription rights. Under Luxembourg law preferential subscription rights are transferable and tradable property rights.

Repurchase of shares

Nexa Resources is prohibited by the 1915 Law from subscribing for its own shares. Nexa Resources may, however, repurchase its own shares or have another person repurchase shares on its behalf, subject to certain conditions, including:

- prior authorization of the general meeting of shareholders setting out the terms and conditions of the proposed repurchase, including the maximum number of shares to be repurchased, the duration of the period for which the authorization is given (which may not exceed five years) and the minimum and maximum consideration per share;
- the repurchase may not reduce the net assets of Nexa Resources on a non-consolidated basis to a level below the aggregate of the issued share capital and the reserves that Nexa Resources must maintain pursuant to the 1915 Law or our articles of association;
- only fully paid-up shares may be repurchased; and
- the acquisition offer is made on the same terms and conditions to all the shareholders who are in the same position; however, listed companies may repurchase their own shares on the stock exchange without making an acquisition offer to the shareholders.

On September 13, 2018, our shareholders authorized the Company to purchase, acquire, receive or hold and sell shares of the Company in accordance with the 1915 Law and any other applicable laws and regulations. The authorization is effective immediately after the general meeting and valid for a period of three years. Off-market transactions are not authorized. The maximum number of shares purchased or acquired shall not in any event exceed 6.5 million shares of the Company, and shall not have the effect of reducing its net assets below the amount set forth in the 1915 Law. For more information, see “Share ownership and trading—Purchases of equity securities by the issuer and affiliated purchasers.”

Form and transfer of shares

Our shares are issued in registered form only and are freely transferable. Luxembourg law does not impose any limitations on the rights of Luxembourg or non-Luxembourg residents to hold or vote our shares.

Under Luxembourg law, the ownership of registered shares is generally evidenced by the inscription of the name of the shareholder, the number of shares held by him or her in the shareholders’ register, which is maintained at our registered office. Each transfer of shares is made by a written declaration of transfer recorded in our shareholders’ register, dated and signed by the transferor and the transferee or by their duly appointed agent. We may accept and enter into its shareholders’ register any transfer based on an agreement between the transferor and the transferee provided a true and complete copy of the agreement is provided to us.

Our articles of association provide that, in case our shares are recorded in the register of shareholders on behalf of one or more persons in the name of a securities settlement system or the operator of such a system, or in the name of a professional depositary of securities or any other depositary or of a sub-depositary designated by one or more depositaries, the Company—subject to a confirmation in proper form received from the depositary—will permit those persons to exercise the rights attaching to those shares, including admission to and voting at general meetings of shareholders. The board of directors may determine the requirements with which such confirmations must comply. Shares held in such manner generally have the same rights and obligations as any other shares recorded in our shareholder register(s).

TAXATION

Luxembourg tax considerations

Scope of Discussion

This summary is based on the laws of Luxembourg, including the Income Tax Law of December 4, 1967, as amended, the Municipal Business Tax Act of December 1, 1936, as amended and the Net Wealth Tax Act of October 16, 1934, as amended, to which we jointly refer as the “Luxembourg tax law”, existing and proposed regulations promulgated thereunder, and published judicial decisions and administrative pronouncements, each as in effect on the date of this report or with a known future effective date. This discussion does not generally address any aspects of Luxembourg taxation other than income tax, corporate income tax, municipal business tax, withholding tax and net wealth tax. This discussion, while not being a complete analysis or listing of all of the possible tax consequences of holding and disposing of shares, addresses the material tax issues. Also, there can be no assurance that the Luxembourg tax authorities will not challenge any of the Luxembourg tax consequences described below; in particular, changes in law and/or administrative practice, as well as changes in relevant facts and circumstances, may alter the tax considerations described below.

For purposes of this discussion, a “Luxembourg shareholder” is any beneficial owner of shares that for Luxembourg income tax purposes is:

- an individual resident of Luxembourg under article 2 of the Luxembourg Income Tax Law, as amended; or
- a corporation or other entity taxable as a corporation that is organized under the laws of Luxembourg or effectively managed from Luxembourg under article 159 of the Income Tax Law, as amended.

This discussion does not constitute tax advice and is intended only as a general guide. Shareholders should also consult their own tax advisors as to the Luxembourg tax consequences of the ownership and disposition of our common shares. The summary applies only to shareholders who will own our common shares as capital assets and does not apply to other categories of shareholders, such as dealers in securities, trustees, insurance companies, collective investment schemes and shareholders who have, or who are deemed to have, acquired their shares in the capital of Nexa Resources by virtue of an office or employment.

Shareholders

Luxembourg income tax on dividends and similar distributions

A non-Luxembourg shareholder will not be subject to Luxembourg income taxes on dividend income and similar distributions in respect of our common shares, other than a potential Luxembourg withholding tax as described below, unless the shares are attributable to a permanent establishment or a fixed place of business maintained in Luxembourg by such non-Luxembourg shareholder.

An individual Luxembourg shareholder will be subject to Luxembourg income tax on dividend income and similar distributions in respect of its shares in Nexa Resources at the applicable progressive rates. Such payments may benefit from a 50.0% exemption set forth in Article 115 15a of the Luxembourg Income Tax Law (LITL), subject to the conditions set out therein (the “50.0% exemption”). If the 50.0% exemption applies, the applicable income tax will be levied on 50% of the gross amount of the dividends at the applicable progressive rates. Taxable dividends are also subject to dependence insurance contribution levied at a rate of 1.4% on the net income where certain Luxembourg shareholders are affiliated to the Luxembourg social security administration.

A corporate Luxembourg shareholder was subject to Luxembourg corporate income tax (CIT) and municipal business tax (MBT) at the aggregate rate of 27.08% in 2017 (i.e. Luxembourg CIT is 20.33% including the surcharge for the unemployment and MBT is 6.75% for having its statutory seat in Luxembourg City). The rate was decreased to 26.01% as of 2018. The taxable basis of a corporate Luxembourg shareholder will, in principle, correspond to its accounting results, unless a specific treatment is provided for by the LITL. A corporate Luxembourg shareholder may benefit from the Luxembourg participation exemption (the “participation exemption”)

with respect to dividends received if the following two conditions are met: (a) the shareholder holds or commits itself to hold at least 10.0% of the share capital of Nexa Resources or a participation with an acquisition price of at least €1.2 million for an uninterrupted period of at least twelve months and (b) the shareholder is a Luxembourg fully taxable corporation. If these cumulative conditions are met, dividends received by the corporate Luxembourg shareholder would be fully exempt from CIT and MBT at the level of the corporate Luxembourg shareholder.

If the conditions with respect to the Luxembourg participation exemption are not met, the corporate Luxembourg shareholders can still benefit from the aforementioned 50.0% exemption, subject to the conditions set out therein.

Luxembourg withholding tax—Share capital reductions or share premium reimbursements

Share capital reductions or share premium reimbursements made by Nexa Resources to the Luxembourg and non-Luxembourg shareholders are in principle subject to a 15% Luxembourg withholding tax, unless they have been motivated by genuine economic reasons. Although genuine economic reasons are not defined by law, Luxembourg tax authorities may examine the given reasons. We do not intend to make capital reductions in the near future. Nexa Resources discloses distributable reserves, retained earnings and profits in its chart of accounts according to Decree dated June 10, 2009. As of December 31, 2018, we have the ability to pay dividends and not share premiums, to the extent we have received cash dividend distributions from our subsidiaries. See “Share ownership and trading—Distributions”.

Luxembourg withholding tax—Distributions to shareholders

A Luxembourg withholding tax of 15.0% is due on dividends and similar distributions made by Nexa Resources to its Luxembourg and non-Luxembourg shareholders unless a Luxembourg domestic dividend withholding tax exemption or a double tax treaty reduction is applicable, as described below. The tax will be withheld by Nexa Resources and remitted to the Luxembourg tax authorities within 8 days as of the date the income is made available to the Luxembourg and non-Luxembourg shareholders.

Exemption from Luxembourg withholding tax—Distributions to shareholders

Dividends paid by Nexa Resources will be exempt from Luxembourg withholding tax provided that the following cumulative conditions are met (the “domestic exemption”):

- at the date of the distribution, the shareholder holds at least 10% of the share capital of Nexa Resources or a participation with an acquisition price of at least €1.2 million for an uninterrupted period of at least twelve months; and
- the dividend is paid to a (i) fully taxable company resident in Luxembourg, (ii) a company resident in a EU Member State fulfilling the conditions of Article 2 of the Parent Subsidiary Directive and listed in the appendix to this directive, (iii) a company resident in a country with which Luxembourg has concluded a double tax treaty and which is fully subject to income tax comparable to the Luxembourg corporate income tax as well as a Luxembourg permanent establishment of such a company, (iv) a company resident of Switzerland and subject to tax without being exempt, (v) a company or a cooperative company resident in a Member State of the European Economic Area, other than a Member State of the EU, and that is fully subject to tax equivalent to the Luxembourg corporate income tax, or (vi) a Luxembourg permanent establishment of a company under (ii) or (v).

Shareholders that are companies resident in countries that have entered into a double tax treaty with Luxembourg may qualify for the domestic exemption described above.

For a shareholder to benefit from such exemption upon a distribution date, Nexa Resources must file a properly completed form 900 with the Luxembourg tax authorities within 8 days following the earlier of (a) the distribution decision date in case no payment date is fixed, and (b) the effective date of payment of the dividend. Luxembourg tax authorities may request all relevant documentation showing fulfillment of the above-mentioned conditions (e.g., including a tax residency certificate). The Company makes no representation that this exemption

procedure will be practicable with respect to shares held through a clearing system such as DTC (in the United States) or CDS (in Canada).

Alternatively, a shareholder may file a refund request (form 901bis, stamped and validated by the tax authorities of the State of residency of the shareholder) with the Luxembourg tax authorities before December 31 of the year following the taxable event (*i.e.*, the distribution). The Company makes no representation that this refund procedure will be practicable for a shareholder residing in the United States, Canada or any other specific jurisdiction.

A shareholder that does not meet the twelve-month holding period described in the first bullet above can request a refund when the twelve-month period has elapsed. The refund request (form 901bis, stamped and validated by the tax authorities of the State of residency of the shareholder) has to be filed with the Luxembourg tax authorities before December 31 of the year following the taxable event.

Forms 900 and 901bis are generally made available on the website of the Luxembourg tax authorities (*Administration des contributions directes*).

The application of the dividend withholding tax exemption to taxable companies resident in other EU member states or to their EU permanent establishments is not granted if the income allocated is part of a tax avoidance scheme.

Reduction of Luxembourg withholding tax—Distributions to shareholders

As mentioned above, pursuant to the provisions of certain bilateral treaties for the avoidance of double taxation concluded between Luxembourg and other countries, and if certain conditions are met, the aforementioned Luxembourg dividend withholding tax may be reduced. Many such treaties, including the double tax treaty with the United States, provide for a tax rate lower than 15 percent only for a shareholder that holds a substantial (generally, 10 percent or 25 percent) portion of a Luxembourg company's shares. Shareholders that hold such shares should consult their tax advisors to determine how to benefit from the reduction in withholding tax rates.

A shareholder that is a company resident in a country that has entered into a double tax treaty with Luxembourg may qualify for the domestic exemption even if the treaty would not reduce the withholding tax rate applicable to dividends paid to that shareholder.

Luxembourg NWT

A non-Luxembourg shareholder will not be subject to Luxembourg net wealth tax (NWT) unless the shares are attributable to a permanent establishment or a fixed place of business maintained in Luxembourg by such non Luxembourg shareholder.

Luxembourg individual shareholders are not subject to Luxembourg NWT. A Luxembourg corporate shareholder will be subject to Luxembourg NWT in respect of the shares held in the capital of Nexa Resources unless it holds more than 10% or €1.2 million of our common shares.

Luxembourg capital gains tax upon disposal of shares

Capital gains derived by a non-Luxembourg shareholder on the sale of our common shares will not be subject to taxation in Luxembourg, unless one of the following conditions applies:

- the shareholder does not benefit from a double tax treaty and (i) holds shares in Nexa Resources representing more than 10% of the share capital of Nexa Resources and such shares were held for less than six months prior to their sale or (ii) has been a resident taxpayer in Luxembourg for at least fifteen years and had acquired nonresident status less than five years prior to the disposal; or
- Our common shares are attributable to a permanent establishment or a fixed place of business maintained in Luxembourg by such non-Luxembourg shareholder. In such case, the non-Luxembourg shareholder is required to recognize capital gains or losses on the sale of such shares, which will be subject to CIT and MBT, unless the participation exemption applies.

Capital gains realized upon the sale of our common shares by a Luxembourg resident individual will be subject to Luxembourg income tax at the level of the Luxembourg resident individual only in case of (i) speculation gains or (ii) gains realized on a substantial participation.

Speculation gains

Capital gains realized upon the sale of our common shares within a shareholding period not exceeding six months will be subject to personal income taxation (unless such capital gain does not exceed €500) in the hands of a Luxembourg resident individual.

Substantial participation

In case where the Luxembourg resident individual has held the shares for at least six months and had a substantial participation, the capital gains realized will be subject to income tax at a rate equal to half the normal progressive rate applicable. A participation is considered as a substantial participation when a Luxembourg resident individual, jointly with his/her spouse and children under the age of 18, holds or has held, directly or indirectly, at any time during the five years prior to the date of the sale, 10.0% or more of the share capital of Nexa Resources.

Capital gains realized by the Luxembourg corporate shareholder (*société de capitaux*) should be exempt from capital gains tax in Luxembourg if at the date of the disposal, the Luxembourg shareholder has held or undertakes to hold, for an uninterrupted period of at least 12 months, a direct participation which represents at least 10.0% of the share capital of Nexa Resources, or which acquisition price was at least €6.0 million. If these conditions are not met, the Luxembourg corporate shareholder would be fully taxed on the capital gains realized upon the sale of the common share. The exempt amount of the capital gains realized will be, however, reduced by the amount of any expenses related to the participation, including decreases in the acquisition cost, that could have previously reduced the company's Luxembourg taxable income.

ATAD rules

On December 21, 2018, the Luxembourg law implementing the European Union (EU) Anti-Tax Avoidance Directive, or ATAD, was published. Among other changes, the law introduced controlled foreign company rules and rules countering hybrid mismatches within the EU, as well as a limitation on interest deductibility. It also amended the general anti-abuse rule and the existing exit taxation regime (including provisions relating to inbound transfers). In addition, the law amended the definition of permanent establishments, and existing domestic provisions regarding the tax-neutral conversion of debt into equity.

Peruvian tax considerations

The following is a general summary of material Peruvian tax matters, as in effect on the date of this report, and describes our understanding of the principal tax consequences of an investment in our common shares by a person or entity who is not considered a resident of Peru for tax purposes. This summary is not intended to be a comprehensive description of all the tax considerations that may be relevant to a decision to make an investment in the offered shares.

This summary is based on provisions of the Peruvian income tax law and its regulations in force as of the date hereof. No rulings from the Peruvian tax authorities or judicial rulings address the tax treatment of instruments similar to the shares of Nexa Resources. Accordingly, no assurance can be given that the Peruvian tax authorities will agree with the conclusions described below. If the Peruvian tax authorities were to take a position different from the conclusions described below, the Peruvian income tax consequences of investing in Nexa Resources may differ from those summarized below.

Sale, exchange or disposition of the shares or a beneficial interest therein

Investors who decide to invest in the shares of Nexa Resources hold the shares in book-entry form, in the name of a nominee holding such shares for the investors' benefit. Any future trading of such shares will be effected through a conveyance of the beneficial interest held by the investors thereupon through the designated clearing mechanism. Because the conveyance of such beneficial interest does not imply the actual transfer of shares, any

capital gains resulting from the conveyance of the beneficial interest in such shares, obtained by a person or entity who is not considered a resident of Peru for Peruvian tax purposes, should not be subject to taxation in Peru.

If, contrary to the conclusion stated above, the sale of our common shares were to qualify as an “indirect transfer of Peruvian shares” (and the transfer of the beneficial interest in the shares were to be considered as an actual transfer of such shares), different rules would apply.

According to Peruvian income tax law, an “indirect transfer of Peruvian shares” is deemed to occur when there is a transfer of shares issued by a non-resident company which, in turn, owns—directly or through one or more companies—shares issued by a Peruvian company, and the following two conditions are concurrently met:

- (i) during any of the 12 months preceding the transfer, the fair market value (FMV) of the shares issued by the Peruvian company held directly or indirectly by the nonresident company which shares are being sold, is equivalent to 50% or more of the FMV of all the shares issued by said non-resident company; and
- (ii) during any 12-month period, the shares transferred by a party, including those transferred by its related parties, represent at least 10% of the shares issued by such non-resident company.

Due to recent modifications to Peruvian income tax law, as of January 1, 2019, even if the abovementioned conditions are not met, an indirect transfer of Peruvian shares will also be deemed to exist if the “total value” of shares of the Peruvian company indirectly transferred within any 12 month period is equivalent to or higher than 40,000 Peruvian tax units (S/168 million or US\$49. million approximately). Said “total value” is determined by multiplying: i) the “percentage” that the FMV of the shares issued by the Peruvian company held (directly or indirectly) by the non-resident company which shares are being transferred, represents with regard to the FMV of all the shares issued by said non-resident company; and, ii) the price agreed for the shares issued by the non-resident company directly transferred. To determine the “total value” threshold, transfers made by those parties which qualify as related to the transferor should also be considered. Nonetheless, the “taxable base” shall be determined, in any case, per party, considering the transfers made by the latter within the abovementioned 12 month period, but excluding those transfers previously taxed.

In case the sale of the shares were to qualify as an “indirect transfer of Peruvian shares” (and the transfer of the beneficial interest on the shares were to be considered as an actual transfer of such shares), any capital gain resulting therefrom will be subject to a 30% tax rate in Peru.

In case the corporate investor that makes the indirect transfer of Peruvian shares has a branch or a permanent establishment with assigned assets in Peru, said corporation will be jointly and severally liable for any income tax that resulted from the transfer of Peruvian shares; it will also be obligated to present to the Peruvian tax authority all the information related to the Peruvian shares of the non-resident investor that are being sold, particularly the information referred to the FMV; participation percentages; capital increase or reduction; issuance and placement of shares or participations; reorganization processes; patrimonial values and balance sheets; etc. **Investors should consult their own tax advisors about the consequences of the acquisition, ownership, and disposition of their investment in the offered shares or any beneficial interest therein, including the possibility that the tax consequences of investing in the offered shares may differ from the description above.**

United States federal income tax considerations

The following is a summary of certain U.S. federal income tax considerations that are likely to be relevant to the purchase, ownership and disposition of our common shares by a U.S. Holder (as defined below).

This summary is based on provisions of the Internal Revenue Code of 1986, as amended (the Code), and U.S. Treasury regulations (Regulations), rulings and judicial interpretations thereof, in force as of the date hereof, and the U.S.-Luxembourg Treaty dated December 20, 2000 (as amended by any subsequent protocols). Those authorities may be changed at any time, perhaps retroactively, so as to result in U.S. federal income tax consequences different from those summarized below.

This summary is not a comprehensive discussion of all of the tax considerations that may be relevant to a particular investor's decision to purchase, hold, or dispose of our common shares. In particular, this summary is directed only to U.S. Holders that hold common shares as capital assets and does not address tax consequences to U.S. Holders who may be subject to special tax rules, such as banks, brokers or dealers in securities or currencies, traders in securities electing to mark to market, financial institutions, life insurance companies, tax exempt entities, entities that are treated as partnerships for U.S. federal income tax purposes (or partners therein), holders that own or are treated as owning 10% or more of our common shares by vote or value, persons holding common shares as part of a hedging or conversion transaction or a straddle, nonresident alien individuals present in the United States for more than 182 days in a taxable year, or persons whose functional currency is not the U.S. dollar. Moreover, this summary does not address state, local or foreign taxes, U.S. federal estate and gift taxes, or the Medicare contribution tax applicable to net investment income of certain non-corporate U.S. Holders, or the alternative minimum tax consequences of acquiring, holding or disposing of common shares.

For purposes of this summary, a "U.S. Holder" is a beneficial owner of common shares that is a citizen or resident of the United States, a U.S. domestic corporation or that otherwise is subject to U.S. federal income taxation on a net income basis in respect of such common shares.

U.S. Holders should consult their tax advisors about the consequences of the acquisition, ownership, and disposition of the common shares, including the relevance to their particular situation of the considerations discussed below and any consequences arising under foreign, state, local or other tax laws.

Taxation of dividends

Subject to the discussion below under "Passive Foreign Investment Company Status" the gross amount of any distribution of cash or property with respect to our common shares that is paid out of our current or accumulated earnings and profits (as determined for U.S. federal income tax purposes) will generally be includable in a U.S. Holder's taxable income as ordinary dividend income on the day on which the U.S. Holder receives the dividend and will not be eligible for the dividends-received deduction allowed to corporations under the Code.

We do not expect to maintain calculations of our earnings and profits in accordance with U.S. federal income tax principles. U.S. Holders therefore should expect that distributions generally will be treated as dividends for U.S. federal income tax purposes.

Subject to certain exceptions for short-term positions, dividends received by an individual with respect to the common shares will be subject to taxation at a preferential rate if the dividends are "qualified dividends." Dividends paid on the common shares will be treated as qualified dividends if:

- the common shares are readily tradable on an established securities market in the United States; and
- we were not, in the year prior to the year in which the dividend was paid, and are not, in the year in which the dividend is paid, a passive foreign investment company (PFIC).

The common shares are listed on the NYSE and will qualify as readily tradable on an established securities market in the United States so long as they are so listed. Based on our consolidated financial statements and relevant market and shareholder data, we believe that we were not classified as a PFIC with respect to our prior taxable year. In addition, based on our consolidated financial statements and our current expectations regarding the value and nature of our assets, the sources and nature of our income and relevant market and shareholder data, we do not anticipate becoming a PFIC for our current taxable year or in the foreseeable future. Accordingly, we expect that dividends paid on the common shares will be treated as qualified dividends. U.S. Holders should consult their tax advisors regarding the availability of the reduced dividend tax rate in light of their own particular circumstances.

Dividend distributions with respect to our common shares generally will be treated as "passive category" income from sources outside the United States for purposes of determining a U.S. Holder's U.S. foreign tax credit limitation. Subject to the limitations and conditions provided in the Code and the applicable Regulations, a U.S. Holder may be able to claim a foreign tax credit against its U.S. federal income tax liability in respect of any Luxembourg income taxes withheld at the appropriate rate applicable to the U.S. Holder from a dividend paid to such U.S. Holder. Alternatively, the U.S. Holder may deduct such Luxembourg income taxes from its U.S. federal

taxable income, provided that the U.S. Holder elects to deduct rather than credit all foreign income taxes for the relevant taxable year. The rules with respect to foreign tax credits are complex and involve the application of rules that depend on a U.S. Holder's particular circumstances. Accordingly, U.S. Holders are urged to consult their tax advisors regarding the availability of the foreign tax credit under their particular circumstances.

U.S. Holders that receive distributions of additional common shares or rights to subscribe for common shares as part of a pro rata distribution to all our shareholders generally will not be subject to U.S. federal income tax in respect of the distributions.

Taxation of dispositions of common shares

Subject to the discussion below under “—Passive Foreign Investment Company Status,” a U.S. Holder generally will recognize gain or loss on the sale, exchange or other disposition of common shares in an amount equal to the difference, if any, between the amount realized upon the sale, exchange or other disposition and the U.S. Holder’s adjusted tax basis in the common shares. A U.S. Holder’s adjusted tax basis in its common shares generally will equal the purchase price for the common shares. Any gain or loss will be capital gain or loss and generally will be long-term capital gain or loss if the common shares have been held for more than one year. Long-term capital gain realized by a U.S. Holder that is an individual generally is subject to taxation at a preferential rate. The deductibility of capital losses is subject to limitations. Gain, if any, realized by a U.S. Holder on the sale or other disposition of the common shares generally will be treated as U.S. source income for U.S. foreign tax credit purposes.

Passive foreign investment company status

Special U.S. tax rules apply to companies that are considered to be PFICs. We will be classified as a PFIC in a particular taxable year if either:

- 75 percent or more of our gross income for the taxable year is passive income; or
- the average percentage of the value of our assets that produce or are held for the production of passive income is at least 50 percent.

Passive income generally includes dividends, interest, royalties, rents, annuities, net gains from the sale or exchange of property producing such income, net foreign currency gains and gains from commodities transactions, other than gains derived from “qualified active sales” of commodities and “qualified hedging transactions” involving commodities, within the meaning of the applicable Regulations (Commodity Exception).

Based on certain estimates of our gross income and gross assets and relying on the Commodity Exception, we do not believe that we currently are a PFIC, and do not anticipate becoming a PFIC in the foreseeable future. However, since PFIC status will be determined by us on an annual basis and since such status depends upon the composition of our income and assets, and the nature of our activities (including our ability to qualify for the Commodity Exception or any similar exceptions), from time to time, there can be no assurance that we will not be considered a PFIC for any taxable year. In the event that, contrary to our expectation, we are classified as a PFIC in any year, and a U.S. Holder does not make a mark-to-market election, as described in the following paragraph, the U.S. Holder will be subject to a special tax at ordinary income tax rates on “excess distributions,” including certain distributions by us and gain that the U.S. Holder recognizes on the sale of the common shares. The amount of income tax on any excess distributions will be increased by an interest charge to compensate for tax deferral, calculated as if the excess distributions were earned ratably over the period that the U.S. Holder holds the common shares. Classification as a PFIC may also have other adverse tax consequences.

A U.S. Holder can avoid the unfavorable rules described in the preceding paragraph by electing to mark the common shares to market. If a U.S. Holder makes this mark-to-market election, the U.S. Holder will be required in any year in which we are a PFIC to include as ordinary income the excess of the fair market value of the U.S. Holder’s common shares at year-end over the U.S. Holder’s basis in those shares. The U.S. Holder’s basis in the shares will be adjusted to reflect the gain or loss. In addition, any gain that the U.S. Holder recognizes upon the sale of the common shares will be taxed as ordinary income in the year of sale.

A U.S. Holder that owns an equity interest in a PFIC must annually file IRS Form 8621, and may be required to file other IRS forms. A failure to file one or more of these forms as required may toll the running of the statute of limitations in respect of each of the U.S. Holder's taxable years for which such form is required to be filed. As a result, the taxable years with respect to which the U.S. Holder fails to file the form may remain open to assessment by the IRS indefinitely, until the form is filed.

U.S. Holders should consult their tax advisors regarding the U.S. federal income tax considerations discussed above and the desirability of making a mark-to-market election if we were to be classified as a PFIC.

Foreign financial asset reporting

Certain U.S. Holders that own "specified foreign financial assets" with an aggregate value in excess of US\$50,000 are generally required to file an information statement along with their tax returns, currently on Form 8938, with respect to such assets. "Specified foreign financial assets" include any financial accounts held at a non-U.S. financial institution, as well as securities issued by a non-U.S. issuer that are not held in accounts maintained by financial institutions. The understatement of income attributable to "specified foreign financial assets" in excess of US\$5,000 extends the statute of limitations with respect to the tax return to six years after the return was filed. U.S. Holders who fail to report the required information could be subject to substantial penalties. Prospective investors are encouraged to consult with their tax advisors regarding the possible application of these rules, including the application of the rules to their particular circumstances.

Backup withholding and information reporting

Dividends paid on, and proceeds from the sale or other disposition of, the common shares to a U.S. Holder generally may be subject to the information reporting requirements of the Code and may be subject to backup withholding unless the U.S. Holder provides an accurate taxpayer identification number and makes any other required certification or otherwise establishes an exemption. Backup withholding is not an additional tax. The amount of any backup withholding from a payment to a U.S. Holder will be allowed as a refund or credit against the U.S. Holder's U.S. federal income tax liability, provided the required information is furnished to the U.S. Internal Revenue Service in a timely manner.

A holder that is a foreign corporation or a non-resident alien individual may be required to comply with certification and identification procedures in order to establish its exemption from information reporting and backup withholding.

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Exchange Controls and Other Limitations Affecting Security Holders

EXCHANGE CONTROLS AND OTHER LIMITATIONS AFFECTING SECURITY HOLDERS

We are not aware of any governmental laws, decrees, regulations or other legislation in Luxembourg that restrict the export or import of capital, including the availability of cash and cash equivalents for use by our affiliated companies, or that affect the remittance of dividends, interest or other payments to non-resident holders of our securities.

EVALUATION OF DISCLOSURE CONTROLS AND PROCEDURES

Our management, with the participation of our chief executive officer and chief financial officer, has evaluated the effectiveness of our disclosure controls and procedures as of December 31, 2018. There are inherent limitations to the effectiveness of any system of disclosure controls and procedures, including the possibility of human error and the circumvention or overriding of the controls and procedures. Accordingly, even effective disclosure controls and procedures can only provide reasonable assurance of achieving their control objectives.

We have evaluated, with the participation of our chief executive officer and chief financial officer, the effectiveness of our disclosure controls and procedures as of December 31, 2018. Based on our evaluation, our chief executive officer and chief financial officer concluded that our disclosure controls and procedures were effective as of December 31, 2018.

INTERNAL CONTROL OVER FINANCIAL REPORTING

Management report on internal control over financial reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting and for assessing the effectiveness of internal control over financial reporting.

Our internal control over financial reporting is a process designed by, or under the supervision of, our chief executive officer and our chief financial officer, and effected by our board of directors, management and other employees, and is designed to provide reasonable assurance regarding the reliability of financial reporting and of the preparation of our consolidated financial statements, in accordance with IFRS as issued by the IASB.

Due to its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness of internal control over financial reporting to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with our policies or procedures may deteriorate.

Our management has assessed the effectiveness of our internal control over financial reporting as of December 31, 2018, based upon the criteria established in Internal Controls—Integrated Framework (2013), issued by the Committee of Sponsoring Organizations of Treadway Commission (COSO). Based on this assessment and criteria, our management has concluded that our internal control over financial reporting was effective as of December 31, 2018.

Remediation activities addressing material weaknesses in internal control over financial reporting in 2017

As reported in our annual report on Form 20-F for the fiscal year 2017, during the preparation for our initial public offering, we identified material weaknesses in our internal control over financial reporting related to the effectiveness of controls intended to ensure the accuracy of the designation of a hedging instrument as net investment hedge and the calculation of earnings per share. The controls were ineffective due to failures in the process applied to consider the impact of legal entity reorganizations on hedging instruments designation and the process applied to consider the retroactive effects of reverse stock splits in the earnings per share calculations.

Subsequently, we identified an error in the calculation of earnings per share in our previously issued financial statements for the year ended December 31, 2017. We incorrectly calculated earnings per share using net income for the year instead of net income attributable to Nexa's shareholders. The error revealed a material weakness in our internal control over financial reporting related to the effectiveness of controls associated with the review of our consolidated financial statements and related disclosures for the year ended December 31, 2017 in accordance with IFRS.

In response to the material weaknesses identified in 2017, our management adopted measures to remedy the deficiencies in the design and operation of internal control over financial reporting. The remediation activities included the following:

- Implementation of additional review procedures for specific non-routine transactions, including involvement of external specialists, when necessary;
- Creation of an internal accounting commission to review non-recurring events, and complex or unusual transactions and their accounting effects on our consolidated financial statements and related disclosures;
- Improvement of internal controls over the preparation and review of our consolidated financial statements and enhancement of the documentation of disclosure through the use of checklists in accordance with IFRS;
- Improvement in the qualifications of our accounting and financial reporting personnel through periodic and IFRS-related training programs, as well as through the hiring of additional employees; and

- Enhancement of our internal policies and reporting procedures to improve our period-end financial reporting process, including the identification of the accounting impacts of non-routine transactions.

As a result, our management's assessment of internal control over financial reporting as of December 31, 2018 did not identify any material weaknesses.

Audit of the effectiveness of internal control over financial reporting

Our independent registered public accounting firm, PricewaterhouseCoopers Auditores Independentes, has audited the effectiveness of our internal control over financial reporting, as stated in their report as of December 31, 2018, which is included herein.

Changes in internal control over financial reporting

Except for the remediation activities described above, there were no changes in our internal control over financial reporting during the fiscal year 2018, which have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

[Table of Contents](#)*Principal Accountant Fees and Services***PRINCIPAL ACCOUNTANT FEES AND SERVICES**

The following table summarizes the fees billed to us by our independent auditors PricewaterhouseCoopers Auditores Independentes for professional services in 2018 and 2017:

	Year ended December 31,	
	2018	2017
	(US\$ thousand)	
Audit fees	1,998.5	2,052.9
Audit-related fees	—	1,264.1
Tax fees	94.6	—
Other fees	—	—
Total fees	2,093.1	3,317.0

“Audit fees” are the aggregate fees billed by PricewaterhouseCoopers Auditores Independentes for the audit of our annual financial statements, the audit of the statutory financial statements of our subsidiaries, and reviews of interim financial statements and attestation services that are provided in connection with statutory and regulatory filings or engagements. They also include fees for services that only the independent auditor reasonably can provide, including the provision of comfort letters and consents in connection with statutory and regulatory filings and the review of documents filed with the SEC and other capital markets or local financial reporting regulatory bodies. “Audit-related fees” are fees charged by PricewaterhouseCoopers Auditores Independentes for assurance and related services that are reasonably related to the performance of the audit or review of our consolidated financial statements and are not reported under “Audit fees.” “Tax fees” are the aggregate fees billed by PriceWaterhouseCoopers Auditores Independentes for services rendered for tax compliance, tax advice and tax planning.

Nexa has established policies and procedures that require any engagement of our independent auditor for audit or non-audit services to be submitted to and pre-approved by the audit committee. In addition, our audit committee may delegate the authority to pre-approve non-audit services to one or more of its members. All non-audit services that are pre-approved pursuant to such delegated authority must be presented to the full audit committee at its first scheduled meeting following such pre-approval. Our audit committee also has the authority to recommend pre-approval policies and procedures to our board of directors and for the engagement of our independent auditor’s services.

INFORMATION FILED WITH SECURITIES REGULATORS

We are subject to various information and disclosure requirements in those countries in which our securities are traded, and we file financial statements and other periodic reports with the SEC and Canadian securities regulatory authorities.

- *United States.* We are subject to the information requirements of the Securities Exchange Act of 1934, as amended, and accordingly file reports and other information with the SEC. Our SEC filings are available to the public from the SEC at <http://www.sec.gov>. You may also inspect Nexa Resources' reports and other information at the offices of the New York Stock Exchange, 11 Wall Street, New York, New York 10005, on which our common shares are listed. For further information on obtaining copies of Nexa Resources' public filings at the New York Stock Exchange, you should call (212) 656-5060.
- *Canada.* We must comply with certain Canadian periodic and ongoing disclosure rules under applicable Canadian provincial and territorial securities laws and, as applicable, the rules of the Toronto Stock Exchange. However, with respect to the rules under applicable Canadian provincial and territorial securities laws, we are able to rely on certain exemptions from many of the requirements under such laws through our compliance with U.S. disclosures given our status in the U.S as a foreign private issuer. We may also be able to rely on certain exemptions under the rules of the Toronto Stock Exchange. Our Canadian filings are available to the public from the website maintained by the Canadian Securities Administrators at www.sedar.com.

GLOSSARY

Brownfields project: An exploration or development project near or within an existing operation, which can share infrastructure and management.

Concentration: The process by which crushed and ground ore is separated into metal concentrates and reject material through processes such as flotation.

Concentrate plant: A plant where metal concentration occurs.

Development: The process of constructing a mining facility and the infrastructure to support the facility is known as mine development.

Diamond drilling: A method of drilling that uses a diamond bit, which rotates at the end of a drill rod or pipe. The opening at the end of the diamond bit allows a solid column of rock to move up into the drill pipe and be recovered at the surface. This column of rock is named drill core and is used for geological, geotechnical logging and for sampling for chemical analysis to define the metal content of the rock or mineralized material. Standard core sizes/diameters are 63.5 mm (defined as HQ), 46.7 mm (defined as NQ) and 36.5 mm (defined as BQ). Most drill rods are 10 feet long. After the first 10 feet are drilled, a new section of pipe is screwed into the top end, so the combination of pipes can be driven another 10 feet into the ground.

Exploration: Activities associated with ascertaining the existence, location, extent or quality of a mineral deposit.

Greenfields project: An exploration or development projects that is located outside the area of influence of existing mine operations and/or infrastructure and will be independently developed and managed.

km: kilometer.

ktpd: Thousand tonnes per day.

LBMA: The London Bullion Market Association.

LME: London Metal Exchange.

Metal concentrate: The crushed and ground material obtained after concentration, including zinc, lead and copper concentrates. This is the product from our mining operations. Most of the zinc concentrate we produce is used in our smelting operations and the remaining portion, along with our lead and copper concentrates, is sold to our customers.

Metallic zinc: Pure metal (99.995% zinc) obtained from the electrodeposition of a zinc sulfate solution, free of impurities, through the RLE (Roaster-Leaching-Electrolysis) process.

Mineralization: The process or processes by which a mineral or minerals are introduced into a rock, resulting in a potentially valuable or valuable deposit.

Mineralized material: Mineral bearing material that has been physically delineated by one or more methods, including drilling and underground work, and is supported by sampling and chemical analysis. This material has been found to contain a sufficient amount of mineralization of an average grade of metal or metals to have economic potential that warrants further exploration evaluation. While this material is not currently or may never be classified as ore reserves, it is reported as mineralized material only if the potential exists for reclassification into the reserves category. This material cannot be classified in the reserves category until final technical, economic and legal factors have been determined. Under the SEC's standards, a mineral deposit does not qualify as a reserve unless it can be economically and legally extracted at the time of reserve determination and it constitutes a proven or probable reserve (as defined below).

Mine site: An economic unit comprised of an underground and/or open pit mine, a treatment plant and equipment and other facilities necessary to produce metals concentrates, in existence at a certain location.

Open pit: Surface mining in which the ore is extracted from a pit. The geometry of the pit may vary with the characteristics of the ore body.

Ore: A mineral or aggregate of minerals from which metal can be economically mined or extracted.

Ore grade: The average amount of metal expressed as a percentage, grams per tonne or in ounces per tonne.

Ounces or oz.: Unit of weight. A troy ounce equals 31.1034 grams. All references to ounces in this report are to troy ounces unless otherwise specified.

Reclamation: The process of stabilizing, contouring, maintaining, conditioning and/or reconstructing the surface of disturbed land (*i.e.*, used or affected by the execution of mining activities) to a state of “equivalent land capability.” Reclamation standards vary widely, but usually address issues of ground and surface water, topsoil, final slope gradients, overburden and revegetation.

Refining: The process of purifying an impure metal; the purification of crude metallic substances.

Secondary feed materials: By-products of industrial processes such as smelting and refining that are then available for further treatment/recycling. It can cover foundry ashes, zinc oxides from brass and bronze production, electric arc furnace (EAF) dust and slags.

SHG: Special High Grade.

Skarn: Metamorphic zone developed in the contact area around igneous rock intrusions when carbonate sedimentary rocks are invaded by large amounts of silicon, aluminum, iron and magnesium. The minerals commonly present in a skarn include iron oxides, calc-silicates, andradite and grossularite garnet, epidote and calcite. Many skarns also include ore minerals. Several productive deposits of copper or other base metals have been found in and adjacent to skarns.

Tailings: Finely ground rock from which valuable minerals have been extracted by concentration.

Tonne: A unit of weight. One metric tonne equals 2,204.6 pounds or 1,000 kilograms. One short tonne equals 2,000 pounds. Unless otherwise specified, all references to “tonnes” in this report refer to metric tonnes.

Zinc equivalent: A metric used to compare mineralization that is comprised of different metals in terms of zinc. Copper, lead, silver and gold contents in our concentrate production have been converted to a zinc equivalent grade at the average benchmark prices for 2018, *i.e.*, US\$2,921.95 per tonne (US\$132.54 per pound) for zinc, US\$6,523.04 per tonne (US\$295.88 per pound) for copper, US\$2,242.43 per tonne (US\$101.71 per pound) for lead, US\$15.71 per ounce for silver and US\$1,268.49 per ounce for gold.

Zinc oxide: A chemical compound that results from the sublimation of zinc (Zn-metal) by oxygen in the atmosphere. Zinc oxide is in the form of powder or fine grains that is insoluble in water but very soluble in acid solutions.

Industry Guide 7 definitions:

Probable (indicated) reserves: Reserves for which quantity and grade and/or quality are computed from information similar to that used for proven (measured) reserves, but the sites for inspection, sampling and measurement are farther apart or are otherwise less adequately spaced. The degree of assurance, although lower than that for proven (measured) reserves, is high enough to assume continuity between points of observation.

Proven (measured) reserves: Reserves for which (a) quantity is computed from dimensions revealed in outcrops, trenches, working or drill holes; grade and/or quality are computed from the results of detailed sampling and (b) the sites for inspection, sampling and measurement are spaced so closely and the geologic character is so well defined that size, shape, depth and mineral content of reserves are well-established.

Reserves: The part of a mineral deposit that could be economically and legally extracted or produced at the time of the reserve determination.

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EXHIBITS

<u>Exhibit Number</u>	
1	Amended Articles of Association of Nexa Resources S.A., dated as of June 28, 2018.
2.1	Indenture with respect to the 5.375% Notes due 2027, dated as of May 4, 2017, among VM Holding S.A., as issuer, Votorantim Metais Zinco S.A., Compañía Minera Milpo S.A.A. and Votorantim Metais Cajamarquilla S.A., as guarantors, and The Bank of New York Mellon, as trustee, registrar, paying agent and transfer agent (incorporated by reference to Exhibit 4.1 to our Registration Statement on Form F-1 (file no. 333-220552) filed with the SEC on September 21, 2017).
2.2	Indenture with respect to the 4.625% Notes due 2023, dated as of March 28, 2013, among Compañía Minera Milpo S.A.A., as issuer, Deutsche Bank Trust Company Americas, as trustee, registrar, paying agent and transfer agent, and Deutsche Bank Luxembourg S.A., as Luxembourg paying agent (incorporated by reference to Exhibit 4.2 to our Registration Statement on Form F-1 (file no. 333-220552) filed with the SEC on September 21, 2017).
8	List of Subsidiaries.
12.1	Certification of Chief Executive Officer of Nexa Resources S.A. pursuant to Rules 13a-14 and 15d-14 under the Securities Exchange Act of 1934, as amended.
12.2	Certification of Chief Financial Officer of Nexa Resources S.A. pursuant to Rules 13a-14 and 15d-14 under the Securities Exchange Act of 1934, as amended.
13.1	Certification of Chief Executive Officer and Chief Financial Officer of Nexa Resources S.A., pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Extension Label Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document

SIGNATURES

The registrant hereby certifies that it meets all of the requirements for filing on Form 20-F and that it has duly caused and authorized the undersigned to sign this annual report on its behalf.

NEXA RESOURCES S.A.

By: /s/ Tito Botelho Martins Junior
Name: Tito Botelho Martins Junior
Title: *Chief Executive Officer*

By: /s/ Rodrigo Nazareth Menck
Name: Rodrigo Nazareth Menck
Title: *Senior Vice President Finance and Group Chief Financial Officer*

Date: April 3, 2019

NEXA RESOURCES S.A. FINANCIAL STATEMENTS

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Nexa Resources S.A.

**Consolidated financial statements
at December 31, 2018 and
independent auditor's report**

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Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Nexa Resources S.A. and its subsidiaries (the “Company”) as of December 31, 2018 and 2017, and the related consolidated income statement, consolidated statement of comprehensive income, consolidated statement of changes in shareholders’ equity and consolidated statement of cash flows for each of the three years in the period ended December 31, 2018, including the related notes (collectively referred to as the “consolidated financial statements”). We also have audited the Company’s internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018 in conformity with International Financial Reporting Standards as issued by the International Accounting Standards Board. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO.

Basis for Opinions

The Company’s management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management’s Report on Internal Control over Financial Reporting. Our responsibility is to express opinions on the Company’s consolidated financial statements and on the Company’s internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (“PCAOB”) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company’s internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company’s internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and

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dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ PricewaterhouseCoopers Auditores Independentes
Curitiba, Brazil
February 15, 2019

We have served as the Company's auditor since 2001.

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Nexa Resources S.A.

Consolidated balance sheet

As at December 31

All amounts in thousands of US dollars

Assets	Note	2018	2017	Liabilities and shareholders' equity	Note	2018	2017
Current assets				Current liabilities			
Cash and cash equivalents	8	1,032,938	1,019,037	Loans and financing	15	32,513	40,841
Financial investments	9	91,878	206,155	Derivative financial instruments	6	8,662	12,588
Derivative financial instruments	6	7,385	7,483	Trade payables		387,225	329,814
Trade accounts receivable	10	173,204	182,713	Confirming payable	16	70,411	111,024
Inventory	11	269,705	324,878	Salaries and payroll charges	17	58,166	79,798
Other assets		122,857	98,641	Dividends payable		663	4,138
		1,697,967	1,838,907	Related parties	12	63	87,686
				Provisions	19	20,357	14,641
				Contractual liabilities	20	31,992	31,296
				Other liabilities		41,798	56,389
						651,850	768,215
Non-current assets				Non-current liabilities			
Financial investments	9	355	392	Loans and financing	15	1,392,354	1,406,458
Derivative financial instruments	6	3,820	4,294	Derivative financial instruments	6	5,560	2,449
Related parties	12	740	738	Related parties	12	1,517	2,238
Deferred taxes	18	201,154	224,513	Provisions	19	280,566	326,520
Other assets		120,175	73,138	Deferred taxes	18	298,598	324,931
Investments in associates		283	309	Contractual liabilities	20	167,645	190,589
Property, plant and equipment	13	1,968,451	1,996,514	Other liabilities		35,515	31,221
Intangible assets	14	1,742,461	1,822,719			2,181,755	2,284,406
		4,037,439	4,122,617	Total liabilities		2,833,605	3,052,621
				Shareholders' equity			
				Capital	21 (a)	133,320	133,320
				Treasury shares	21 (b)	(1,352)	—
				Share premium	21 (c)	1,043,755	1,123,755
				Additional paid in capital	21 (d)	1,318,728	1,318,728
				Retained earnings (cumulative deficit)		61,430	(11,612)
				Accumulated other comprehensive loss	21 (e)	(79,288)	(77,356)

	Total equity attributable to Nexa's shareholders		2,476,593	2,486,835
	Non-controlling interests	21 (g)	425,208	422,068
			2,901,801	2,908,903
Total assets	5,735,406	5,961,524	Total liabilities and shareholders' equity	5,735,406

The accompanying notes are an integral part of these consolidated financial statements.

Nexa Resources S.A.

Consolidated income statement

Years ended December 31

All amounts in thousands of US dollars, unless otherwise stated

	Note	2018	(Revised) 2017	(Revised) 2016
Net revenues	22	2,491,202	2,449,484	1,964,841
Cost of sales	23	(1,888,944)	(1,752,825)	(1,504,229)
Gross profit		602,258	696,659	460,612
Operating expenses				
Selling	23	(18,743)	(17,616)	(25,519)
General and administrative	23	(140,860)	(136,878)	(118,694)
Mineral exploration and project development	24	(126,278)	(92,698)	(46,711)
Other income and expenses, net	25	18,176	(47,887)	(139,719)
		(267,705)	(295,079)	(330,643)
Operating income		334,553	401,580	129,969
Net financial results	26			
Financial income		67,509	29,868	24,955
Financial expenses		(121,662)	(106,169)	(70,374)
Foreign exchange (loss) gain, net		(148,501)	(53,880)	124,500
		(202,654)	(130,181)	79,081
Results of investees				
Share in the results of associates		—	60	(158)
Income before income tax		131,899	271,459	208,892
Income tax	18 (a)			
Current		(71,787)	(125,691)	(75,282)
Deferred		30,864	19,497	(23,101)
Net income for the year		90,976	165,265	110,509
Attributable to NEXA's shareholders		74,860	126,885	93,167
Attributable to non-controlling interests		16,116	38,380	17,342
Net income for the year		90,976	165,265	110,509
Average number of outstanding shares - thousands		133,313	116,527	80,699
Basic and diluted earnings per share - US\$	21 (f)	0.56	1.09	1.15

The accompanying notes are an integral part of these consolidated financial statements.

Nexa Resources S.A.**Consolidated statement of comprehensive income**

Years ended December 31

All amounts in thousands of US dollars

	Note	2018	2017	2016
Net income for the year		90,976	165,265	110,509
Other comprehensive income (loss) net of taxes, all of which can be reclassified to the income statement				
Cash flow hedge accounting	21 (e)	(2,192)	12,556	(16,256)
Translation adjustment of foreign subsidiaries	21 (e)	(9,959)	(10,742)	30,373
		(12,151)	1,814	14,117
Total comprehensive income for the year		78,825	167,079	124,626
Comprehensive income attributable to NEXA's shareholders		72,928	125,941	101,199
Comprehensive income attributable to non-controlling interests		5,897	41,138	23,427
		78,825	167,079	124,626

The accompanying notes are an integral part of these consolidated financial statements.

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Nexa Resources S.A.

Consolidated statement of changes in shareholders' equity

Years ended December 31

All amounts in thousands of US dollars

	Capital	Treasury shares	Share premium	Additional paid in capital	Retained earnings (cumulative deficit)	Accumulated other comprehensive income (loss)	Total	Non-controlling interests	Total shareholders equity
At January 1, 2016	1,280,505	—	—	1,616,158	(230,167)	(81,117)	2,585,379	943,096	3,528,475
Total comprehensive income for the year									
Net income for the year	—	—	—	—	93,167	—	93,167	17,342	110,509
Other comprehensive income for the year	—	—	—	—	—	8,032	8,032	6,085	14,117
Total comprehensive income for the year	—	—	—	—	93,167	8,032	101,199	23,427	124,626
Total contributions by and distributions to shareholders									
Dividends distribution	—	—	—	—	(959)	—	(959)	(9,396)	(10,355)
Disbursements from equity transactions with non-controlling shareholders	—	—	—	(6,819)	—	—	(6,819)	(2,635)	(9,454)
Issuance of new shares	110,911	—	59,159	—	—	—	170,070	—	170,070
Constitution of share premium	(350,000)	—	350,000	—	—	—	—	—	—
Reimbursement of share premium	—	—	(69,931)	—	—	—	(69,931)	—	(69,931)
Put option of shares	—	—	—	(170,070)	—	—	(170,070)	—	(170,070)
Energy Assets compensation	—	—	—	(52,847)	—	—	(52,847)	—	(52,847)
Cancellation of the loan due by NEXA BR to VSA	—	—	—	15,717	—	—	15,717	—	15,717
Acquisition of shares from non-controlling shareholders	—	—	—	276,317	(84)	—	276,233	(478,148)	(201,915)
Total contributions by and distributions to shareholders	(239,089)	—	339,228	62,298	(1,043)	—	161,394	(490,179)	(328,785)
At December 31, 2016	1,041,416	—	339,228	1,678,456	(138,043)	(73,085)	2,847,972	476,344	3,324,316
Total comprehensive income for the year									
Net income for the year	—	—	—	—	126,885	—	126,885	38,380	165,265
Other comprehensive income (loss) for the year	—	—	—	—	3,327	(4,271)	(944)	2,758	1,814
Total comprehensive income (loss) for the year	—	—	—	—	130,212	(4,271)	125,941	41,138	167,079
Total contributions by and distributions to shareholders									
Reversion of Put Option	—	—	—	173,734	—	—	173,734	—	173,734
Capital reduction related to Polarix acquisition	—	—	—	(87,711)	—	—	(87,711)	—	(87,711)
Purchase of Polarix	—	—	—	(81,615)	—	—	(81,615)	—	(81,615)
Constitution of share premium	(928,596)	—	928,596	—	—	—	—	—	—
Reimbursement of share premium	—	—	(430,000)	—	—	—	(430,000)	—	(430,000)
Increase (decrease) in non-controlling interests, net	—	—	—	(366,197)	—	—	(366,197)	(38,280)	(404,477)
Increase in participation in associates	—	—	—	2,061	—	—	2,061	(2,061)	—
Dividends distribution	—	—	—	—	(3,781)	—	(3,781)	(55,073)	(58,854)
Proceed from initial public offering, net of underwriter expenses	20,500	—	285,931	—	—	—	306,431	—	306,431
Total contributions by and distributions to shareholders	(908,096)	—	784,527	(359,728)	(3,781)	—	(487,078)	(95,414)	(582,492)
At December 31, 2017	133,320	—	1,123,755	1,318,728	(11,612)	(77,356)	2,486,835	422,068	2,908,903
Impact of the adoption of IFRS 9	—	—	—	—	(1,818)	—	(1,818)	—	(1,818)
At January 1, 2018 after impacts of IFRS 9 adoption	133,320	—	1,123,755	1,318,728	(13,430)	(77,356)	2,485,017	422,068	2,907,085
Total comprehensive income for the year									
Net income for the year	—	—	—	—	74,860	—	74,860	16,116	90,976
Other comprehensive loss for the year	—	—	—	—	—	(1,932)	(1,932)	(10,219)	(12,151)
Total comprehensive income (loss) for the year	—	—	—	—	74,860	(1,932)	72,928	5,897	78,825

Total contributions by and distributions to shareholders										
Disbursements from equity transactions with non-controlling shareholders	—	—	(80,000)	—	—	—	(80,000)	(2,757)	(2,757)	(2,757)
Reimbursement of share premium	—	(1,352)	—	—	—	—	(1,352)	—	—	(80,000)
Repurchase of the Company's own shares	—	(1,352)	(80,000)	—	—	—	(1,352)	—	—	(1,352)
Total contributions by and distributions to shareholders	<u>—</u>	<u>(1,352)</u>	<u>(80,000)</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>(1,352)</u>	<u>(2,757)</u>	<u>(2,757)</u>	<u>(84,109)</u>
At December 31, 2018	133,320	(1,352)	1,043,755	1,318,728	61,430	(79,288)	2,476,593	425,208	2,901,801	

The accompanying notes are an integral part of these consolidated financial statements.

Nexa Resources S.A.

Consolidated statement of cash flows
Years ended December 31
All amounts in thousands of US dollars

	<u>Note</u>	<u>2018</u>	<u>2017</u>	<u>2016</u>
Cash flow from operating activities				
Income before income tax		131,899	271,459	208,892
Depreciation and amortization	13 and 14	267,189	270,454	275,034
Interest and foreign exchange (gain) or loss		143,199	52,287	(96,766)
Loss on sale of property, plant and equipment and intangible assets	25	8,616	694	552
Impairment (reversal) of property, plant and equipment	25	3,283	—	(979)
Changes in provisions		29,777	32,798	93,701
Tax credits	25 and 26	(63,615)	(53)	—
Gain on sale of investment	25	(348)	(4,588)	(408)
Share in the results of associates		—	(60)	158
Changes in operating assets and liabilities	8 (b)	10,575	(85,152)	181,067
Interest paid		(74,592)	(58,635)	(37,321)
Income taxes paid		(108,385)	(100,265)	(38,869)
Net cash provided by operating activities		<u>347,598</u>	<u>378,939</u>	<u>585,061</u>
Cash flow from investing activities				
Acquisitions of property, plant and equipment and intangible assets	13 and 14	(299,773)	(197,638)	(182,989)
Changes in financial investments		140,402	(65,661)	(47,749)
Loan received from related parties		—	—	10,284
Advance paid for Pollarix acquisition		—	(81,615)	—
Proceed from capital reduction of investees		—	—	6,248
Proceeds from the sale of non-current assets		1,268	16,542	12,787
Net cash used in investing activities		<u>(158,103)</u>	<u>(328,372)</u>	<u>(201,419)</u>
Cash flow from financing activities				
Proceeds from new loans and financing	15	292,901	830,598	550,966
Payments of loans and financing	15	(295,104)	(537,254)	(483,100)
Capital reduction related to Pollarix acquisition	12 (i)	(87,623)	(55,380)	—
Dividends distribution		(3,475)	(61,549)	(59,660)
Reimbursement of share premium		(80,000)	(430,000)	(69,931)
Proceeds from initial public offering, net of underwriter expenses		—	306,431	—
Issuance of new shares		—	—	170,070
Proceeds from transactions with related parties		—	—	3,967
Acquisition of shares from non-controlling shareholders		—	—	(201,915)
Repurchase of the Company's own shares	21 (b)	(1,352)	—	—
Disbursement from equity transactions with non-controlling shareholders		(2,757)	—	(2,635)
Net cash provided by (used in) financing activities		<u>(177,410)</u>	<u>52,846</u>	<u>(92,238)</u>
Effects of foreign exchange rates on cash and cash equivalents		1,816	48	2,757
Increase in cash and cash equivalents		13,901	103,461	294,161
Cash and cash equivalents at the beginning of the year		1,019,037	915,576	621,415
Cash and cash equivalents at the end of the year		1,032,938	1,019,037	915,576

The accompanying notes are an integral part of these consolidated financial statements.

Nexa Resources S.A.
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1 General information

Nexa Resources S.A. (“NEXA”) was incorporated on February 26, 2014 under the laws of Luxembourg as a public limited liability company (société anonyme). Its shares are publicly traded on the New York Stock Exchange (“NYSE”) and the Toronto Stock Exchange (“TSX”). The Company’s registered office is located at 37A, Avenue J. F. Kennedy in the city of Luxembourg in the Grand Duchy of Luxembourg.

NEXA and its subsidiaries (the “Company”) own and operate three polymetallic mines in Peru and two polymetallic mines in Brazil. Its operations are large-scale, mechanized underground and open pit mines. The Company also owns a zinc smelter in Peru and two zinc smelters in Brazil.

The Company’s majority shareholder is Votorantim S.A. (“VSA”), which holds 64.25% of its equity. VSA is a Brazilian privately-owned industrial conglomerate that holds ownership interests in metal, steel, cement and energy companies, among others.

Information by business segment and geographic area

Business segment definition

The Company’s CEO has been identified as the chief operating decision maker (“CODM”), since he has the final authority over resource allocation decisions and performance assessment. The CEO analyzes performance from a product perspective and the Company has identified two reportable segments:

- Mining: consists of five long-life polymetallic mines, three located in the Central Andes of Peru and two located in the state of Minas Gerais in Brazil. In addition to zinc, the Company produces substantial amounts of copper, lead, silver and gold as by-products, which reduce the overall cost to produce mined zinc.
- Smelting: consists of three operating units, one located in Cajamarquilla in Peru and two located in the state of Minas Gerais in Brazil. The facilities recover and produce metallic zinc (SHG zinc and zinc alloys), zinc oxide and by-products, such as sulfuric acid.

Accounting policy

Segment performance is measured based on Adjusted EBITDA, since financial results and income taxes are managed within the corporate level and are not allocated to operating segments. Adjusted EBITDA is defined as net income (loss) for the year, adjusted by (i) share in the results of associates, (ii) depreciation and amortization, (iii) net financial results, (iv) income tax, (v) gain (loss) on sale of investment, (vi) impairment and impairment reversal. In addition, management may exclude non-cash and non-recurring items considered exceptional from the measurement of Adjusted EBITDA.

The internal information used for making decisions is prepared applying accounting measurement basis with managerial reclassifications between income statements lines, which are reconciled to the consolidated financial statements in the column “Adjustments”.

When applicable, the Company uses arm’s length commercial terms for intersegment sales. The Company’s corporate headquarters expenses are allocated to the reportable segments to the extent they are allocated in the measures of performance used by the CODM.

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Segment results

The presentation of segment results and reconciliation to income before income tax in the consolidated income statement is as follows:

	2018				
	Mining	Smelting	Intersegments sales	Adjustments	Consolidated
Net revenues	1,163,741	2,030,568	(704,031)	924	2,491,202
Cost of sales	(694,024)	(1,876,034)	704,031	(22,917)	(1,888,944)
Gross Profit	469,716	154,534	—	(21,993)	602,257
Selling, general and administrative	(44,940)	(79,969)	—	(34,693)	(159,603)
Mineral explorations and project development	(112,713)	(11,067)	—	(2,498)	(126,278)
Other income and expenses, net	(54,042)	16,450	—	55,768	18,176
Operating income	258,021	79,948	—	(3,416)	334,553
Depreciation and amortization	172,357	94,832	—	—	267,189
Exceptional items (i)	—	—	—	3,050	3,050
Adjusted EBITDA	430,378	174,781	—	(366)	604,792
Exceptional items (i)				(3,050)	(3,050)
Depreciation and amortization				(267,189)	(267,189)
Net financial results				(202,654)	(202,654)
Income before income tax					131,899
	2017				
	Mining	Smelting	Intersegments sales	Adjustments	Consolidated
Net revenues	1,213,221	1,952,006	(721,463)	5,719	2,449,483
Cost of sales	(680,811)	(1,746,771)	721,463	(46,706)	(1,752,825)
Gross Profit	532,410	205,235	—	(40,987)	696,658
Selling, general and administrative	(41,054)	(89,128)	—	(24,312)	(154,494)
Mineral explorations and project development	(86,119)	(3,989)	—	(2,590)	(92,698)
Other income and expenses, net	(54,777)	(58,749)	—	65,640	(47,886)
Operating income	350,460	53,369	—	(2,249)	401,580
Depreciation and amortization	171,085	99,370	—	—	270,454
Exceptional items (i)	—	—	—	(4,515)	(4,515)
Adjusted EBITDA	521,545	152,739	—	(6,764)	667,519
Exceptional items (i)				4,515	4,515
Share in the results of associates				60	60
Depreciation and amortization				(270,454)	(270,454)
Net financial results				(130,181)	(130,181)
Income before income tax					271,459
	2016				
	Mining	Smelting	Intersegments sales	Adjustments	Consolidated
Net revenues	907,425	1,491,988	(438,238)	3,666	1,964,841
Cost of sales	(608,825)	(1,307,436)	438,238	(26,206)	(1,504,229)
Gross Profit	298,600	184,552	—	(22,540)	460,612
Selling, general and administrative	(46,829)	(69,950)	—	(27,436)	(144,213)
Mineral explorations and project development	(41,759)	(2,925)	—	(2,026)	(46,711)
Other income and expenses, net	(49,478)	(139,922)	—	49,681	(139,719)
Operating income	160,534	(28,245)	—	(2,321)	129,969
Depreciation and amortization	176,261	98,772	—	—	275,034
Exceptional items (i)	—	—	—	(1,079)	(1,079)
Adjusted EBITDA	336,796	70,528	—	(3,400)	403,924
Exceptional items (i)				1,079	1,079
Share in the results of associates				(158)	(158)
Depreciation and amortization				(275,034)	(275,034)
Net financial results				79,081	79,081
Income before income tax					208,892

(i) Exceptional items are composed of impairment of property, plant and equipment in the amount of USD 3,283 in 2018 and miscellaneous adjustments to reconcile the segments' Adjusted EBITDA to the consolidated Adjusted EBITDA.

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2 Basis of preparation of the consolidated financial statements

The consolidated financial statements of the Company have been prepared in accordance with International Financial Reporting Standards (“IFRS”) and interpretations issued by the IFRS Interpretations Committee applicable to companies reporting under IFRS. The consolidated financial statements comply with IFRS as issued by the International Accounting Standards Board.

The consolidated financial statements have been prepared under the historical cost convention, except for some financial assets and financial liabilities (including derivative financial instruments) measured at fair value at the end of each reporting period.

The consolidated financial statements of the Company for the year ended December 31, 2018 were approved to be issued in accordance with a resolution of the Board of Directors on February 15, 2019.

2.1 Principles of consolidation

(a) Subsidiaries

Subsidiaries include all entities over which the Company has control. The Company controls an entity when it (i) has the power over the entity; (ii) is exposed, or has the right, to variable returns from its involvement with the entity; and (iii) has the ability to affect those returns through its power over the entity. Subsidiaries are fully consolidated from the date on which control is transferred to the Company, except when the predecessor basis of accounting is applied. Subsidiaries are deconsolidated from the date on which that control ceases.

When the Company has less than a majority of the voting rights of an investee, it considers that it has power over the investee when the voting rights are sufficient to give it the practical ability to direct the relevant activities of the investee unilaterally.

Non-controlling interests in the equity and results of subsidiaries are shown separately in the consolidated balance sheet, income statement, statement of comprehensive income and statement of changes in shareholders' equity.

Transactions, balances and unrealized gains and losses between consolidated entities are eliminated.

(b) Joint operations

The Company recognizes its direct right to the assets, liabilities, revenues and expenses of joint operations and its share of any jointly held assets or incurred liabilities and revenues and expenses.

A joint operation is a joint arrangement whereby the parties that have joint control of the arrangement have rights to the assets, and obligations for the liabilities, relating to the arrangement. Joint control is the contractually agreed sharing of control of an arrangement, which exists only when decisions about the relevant activities require unanimous consent of the parties sharing control.

Transactions, balances and unrealized gains and losses between consolidated entities are eliminated.

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Main companies included in the consolidated financial statements:

Subsidiaries	Percentage of capital		Headquarters	Activities
	2018	2017		
Cia. Magistral S.A.C	100.00	100.00	Peru	Mining projects
Nexa Resources Atacocha S.A.A. - "NEXA ATACOCHA"	66.62	66.62	Peru	Mining
Nexa Resources Perú S.A.A. - "NEXA PERU"	80.23	80.23	Peru	Mining
Inversiones Garza Azul S.A.C	99.75	100.00	Peru	Holding and others
Votorantim GmbH	100.00	100.00	Austria	Holding and others
Polarix S.A. - "Polarix" (i)	33.33	33.33	Brazil	Holding and others
L.D.O.S.P.E. Geração de Energia e Participações Ltda. - "L.D.O.S.P.E."	100.00	100.00	Brazil	Energy
L.D.Q.S.P.E. Geração de Energia e Participações Ltda. - "L.D.Q.S.P.E."	100.00	100.00	Brazil	Energy
L.D.R.S.P.E. Geração de Energia e Participações Ltda. - "L.D.R.S.P.E."	100.00	100.00	Brazil	Energy
Nexa Resources El Porvenir S.A.C.	99.99	99.99	Peru	Mining
Nexa Resources UK Ltd. - "NEXA UK"	100.00	100.00	United Kingdom	Mining
Minera Bongará S.A.	61.00	61.00	Peru	Mining projects
Minera Pampa de Cobre S.A.C	99.99	99.99	Peru	Mining
Mineração Dardanelos Ltda.	70.00	70.00	Brazil	Mining projects
Mineração Santa Maria Ltda.	99.99	99.99	Brazil	Mining projects
Rayrock Antofagasta S.A.C	99.99	99.99	Chile	Holding and others
Nexa Resources Cajamarquilla S.A. - "NEXA CJM"	99.99	99.99	Peru	Smelting
Nexa Recursos Minerais S.A. - "NEXA BR"	100.00	100.00	Brazil	Mining / Smelting
Votorantim US. Inc.	100.00	100.00	United States	Holding and others
Joint-operation				
Campos Novos Energia S.A. - "Enercan"	20.98	20.98	Brazil	Energy
Cia. Minera Shalipayco S.A.C	75.00	75.00	Peru	Mining projects

- (i) Polarix is the energy holding company and sells energy to the Company's Brazilian operating subsidiaries at market prices. NEXA BR owns all the common shares of Polarix, which represents 33.33% of its total share capital. The remaining shares are preferred shares with limited voting rights, which are owned by NEXA's controlling shareholder, VSA.

(c) Foreign currency translation

(i) Functional and presentation currency

Items included in the financial statements of each of the Company's entities are measured using the currency of the primary economic environment in which the entity operates ("the functional currency"). The Company's consolidated financial statements are presented in US Dollars ("USD"), which is NEXA's functional and reporting currency.

(ii) Transactions and balances

Foreign currency transactions are translated into the functional currency using the exchange rates at the dates of the transactions. Foreign exchange gains and losses resulting from the settlement of such transactions and from the translation of monetary assets and liabilities denominated in foreign currencies at the end of each reporting period are recognized in the income statement.

Translation differences on assets and liabilities carried at fair value are reported as part of the fair value gain or loss.

(iii) Consolidated entities

The results of operations and financial position of consolidated entities that have a functional currency different from the reporting currency are translated into the reporting currency as follows:

- Assets and liabilities for each balance sheet presented are translated at the closing rate at the end of the reporting period;
- Income and expenses for each income statement are translated at average exchange rates which is a reasonable approximation of the cumulative effect of the rates prevailing on the transaction dates; and
- All resulting exchange differences are recognized in other comprehensive income and accumulated in a separate component of shareholders' equity.

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(d) Transactions with non-controlling interests

Transactions with non-controlling interests that do not result in a loss of control are accounted within the shareholders' equity. A change in ownership interest results in an adjustment between the carrying amounts of the controlling and non-controlling interests to reflect their relative interests in the subsidiary. Any difference between the amount of the adjustment to non-controlling interests and any consideration paid or received is recognized in a separate reserve within shareholders' equity.

2.2 Reclassification of income statement

(a) Reclassification of mineral exploration and project development expenses and impact of adoption of IFRS 15

The Company changed the presentation of mineral exploration and project development expenses that were previously presented as "General and administrative expense" and "Other income and expenses, net" in the income statement to a new line item labeled "Mineral exploration and project development". Refer to Note 24 for details of mineral exploration and project development expenses.

The reclassification has no impact on the Company's financial position, net income for the year or cash flows.

Refer to Note 3(a) for details about the impact of the adoption of IFRS 15.

(b) Reconciliation of reclassified comparative figures and effects of adoption of IFRS 15

(i) Income statement

	(Original) 2017	Adoption of IFRS 15	Reclassification of mineral exploration and project development	(Revised) 2017
Net revenues	2,449,484	—	—	2,449,484
Cost of sales	(1,681,202)	(71,623)	—	(1,752,825)
Gross profit	768,282	(71,623)	—	696,659
Operating expenses				
Selling	(89,239)	71,623	—	(17,616)
General and administrative	(148,242)	—	11,364	(136,878)
Mineral exploration and project development	—	—	(92,698)	(92,698)
Other income and expenses, net	(129,221)	—	81,334	(47,887)
Operating income	(366,702)	71,623	—	(295,079)
	401,580	—	—	401,580

	(Original) 2016	First adoption of IFRS 15	Reclassification of mineral exploration and project development	(Revised) 2016
Net revenues	1,964,841	—	—	1,964,841
Cost of sales	(1,439,101)	(65,128)	—	(1,504,229)
Gross profit	525,740	(65,128)	—	460,612
Operating expenses				
Selling	(90,647)	65,128	—	(25,519)
General and administrative	(127,305)	—	8,611	(118,694)
Mineral exploration and project development	—	—	(46,711)	(46,711)
Other income and expenses, net	(177,819)	—	38,100	(139,719)
Operating income	(395,771)	65,128	—	(330,643)
	129,969	—	—	129,969

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(ii) Expenses by nature

	(Original) 2017	Adoption of IFRS 15	Reclassification of mineral exploration and project development	(Revised) 2017
Raw materials and consumables used	1,120,540	—	—	1,120,540
Employee benefit expenses	278,285	—	1,086	279,371
Depreciation and amortization	270,454	—	2	270,456
Services, miscellaneous	232,165	(71,623)	59,993	220,535
Other Expenses	17,239	71,623	20,253	109,115
	1,918,683	—	81,334	2,000,017
Reconciliation				
Cost of sales	1,681,202	71,623	—	1,752,825
Selling, general and administrative expenses	237,481	(71,623)	(11,364)	154,494
Mineral exploration and project development	—	—	92,698	92,698
	1,918,683	—	81,334	2,000,017
	(Original) 2016	First adoption of IFRS 15	Reclassification of mineral exploration and project development	(Revised) 2016
Raw materials and consumables used	956,909	—	—	956,909
Employee benefit expenses	233,755	—	450	234,205
Depreciation and amortization	275,034	—	2	275,036
Services, miscellaneous	158,388	(65,128)	29,297	122,557
Other Expenses	32,967	65,128	8,351	106,446
	1,657,053	—	38,100	1,695,153
Reconciliation				
Cost of sales	1,439,101	65,128	—	1,504,229
Selling, general and administrative expenses	217,952	(65,128)	(8,611)	144,213
Mineral exploration and project development	—	—	46,711	46,711
	1,657,053	—	38,100	1,695,153

3 Changes in accounting policies and disclosures

(a) New and amended IFRS standards that are effective beginning on January 1, 2018

IFRS 9 - “Financial instruments: Recognition and measurement”

Main impacts introduced by the standard

IFRS 9 — “Financial Instruments” replaces IAS 39 and all previous versions of IFRS 9. IFRS 9 brings together all three aspects of the accounting for financial instruments project, which are classification and measurements, impairment, and hedge accounting.

IFRS 9 became effective on January 1, 2018 and the Company has applied it accordingly.

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Impacts of adoption

Classification and measurement

The Company adopted retrospective transition method as mentioned by IFRS 9, however no adjustments to the accounting balances were deemed necessary.

IFRS 9 has changed the categories for classification of financial assets, eliminating the categories held-to-maturity, loans and receivables and available for sale. The Company's financial assets have been classified in one of the following categories: measured at amortized cost, measured at fair value through other comprehensive income or, measured at fair value through profit or loss. The classification of financial assets under IFRS 9 is generally based on the business model in which a financial asset is managed and its contractual cash flow characteristics.

The following table summarizes the differences in classification and measurements categories under IAS 39 and the new measurement categories under IFRS 9 for each class of the Company's financial assets. There were no changes in classification and measurement of the Company's financial liabilities.

January 1, 2018				
Financial assets	Classification under IAS 39	New classification under IFRS 9	Original carrying amount under IAS 39	New carrying amount under IFRS 9
Cash and cash equivalents	Loans and receivable	Fair value through profit or loss	1,019,037	1,019,037
Financial investments	Assets held for trading	Fair value through profit or loss	206,547	206,547
Derivative financial instruments	Assets held for trading/Used for hedging	Fair value through profit or loss / Fair value through other comprehensive income	11,777	11,777
Trade accounts receivable	Loans and receivable	Fair value through profit or loss / Amortized cost	182,713	182,469
Related parties	Loans and receivable	Fair value through profit or loss / Amortized cost	738	738

The most significant changes are related to the classification and measurement of trade account receivables where the Company has concluded that it operates using different business models, being (i) held to collect and sell and (ii) held to collect. See Note 10 for details of the Company's business model for trade account receivables.

At January 1, 2018, the fair value adjustment of trade accounts receivable that are held to collect and sell recognized in "Cumulative deficit" was USD 244, net of taxes.

Impairment

The Company adopted the retrospective transition method as mentioned by IFRS 9. However, the Company did not restate years prior to January 1, 2018, because it would not be possible without the use of hindsight.

IFRS 9 replaced the incurred loss model in IAS 39 and requires impairment of financial assets to be determined using an expected credit loss model. The new impairment model applies to financial assets that are subsequently measured at amortized cost or fair value through other comprehensive income, including trade accounts receivable.

The most significant impact for the Company is related to impairment of trade accounts receivable, which is measured at amortized cost. The Company elected to apply the simplified approach set forth in IFRS 9 and recognized impairment losses for trade accounts receivable based on lifetime expected losses and using a loss provision matrix.

At January 1, 2018, incremental impairment losses under IFRS 9 recognized in "Cumulative deficit" was USD 1,574, net of taxes.

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Hedge accounting

New hedge accounting requirements impacted the Company's hedge documentation, without having impacted the Company's financial position or results of its operations.

IFRS 15 — “Revenue from contracts with customers”

Main impacts introduced by the standard

IFRS 15 — “Revenue from Contracts” with customers establishes a comprehensive framework for determining the amount and timing when revenue is recognized. It replaced the guidance contained in IAS 18 — “Revenue” which the Company followed until December 31, 2017.

IFRS 15 became effective on January 1, 2018 and the Company has applied it accordingly.

The Company elected to adopt IFRS 15 using the full retrospective method. Comparative financial information has been restated.

Adoption of IFRS 15 by the Company has not resulted in any material changes in timing or amount of revenue recognition under IFRS 15 model as compared to revenue that would be reported under IAS 18 - “Revenue”. Therefore, there were no impacts of the adoption of IFRS 15 on the Company's balance sheet and statement of cash flows. However, the Company identified distinct performance obligations that affected the presentation of the income statement as discussed below.

Impacts of adoption

Identification of performance obligations and timing of satisfaction of performance obligations

As a result of the distinct performance obligations identified, part of the Company's revenues is presented as revenues from services. Cost related to revenues from services is presented as “Cost of sales”. Revenues from services was USD 70,896 for the year ended December 31, 2018 (2017 — USD 71,623; 2016 — USD 65,128).

Determining the transaction price and the amounts allocated to performance obligations

The Company has considered the terms of the contracts and its customary business practices to determine the transaction price. The transaction price is the amount of consideration to which the Company expects to be entitled in exchange for transferring promised goods or services to its customers. Transaction price is allocated to each performance obligation on a relative standalone selling price basis.

For the purpose of determining the transaction price, the Company's contracts have mainly fixed prices. However, the Company's silver streaming arrangement have variable consideration related to Cerro Lindo's silver production. The impact on recognition of revenues related to these sales was not material.

Contractual liabilities

The advance payment received in connection with the Company's silver streaming agreement has been accounted for as contractual liability, with amounts recognized as revenue as the silver is delivered to the customer. The impact on recognition of revenue related to these sales was not material.

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(b) New standards and interpretations not yet adopted

IFRS 16 - “Leases”

Main aspects introduced by the standard

IFRS 16 was issued in January 2016. It will result in almost all leases being recognized on the balance sheet by lessees, as the distinction between operating and finance leases is removed. Under the new standard, an asset (the right to use the leased item) and a financial liability to pay rentals are recognized. The only exceptions are short-term and low-value leases.

Transition method

The Company will apply IFRS 16 from its mandatory adoption date of January 1, 2019, using the simplified transition approach and will not restate comparative periods for the years prior to the adoption. Right-of-use assets will be measured on transition at the amount of the lease liability, adjusted by any prepaid or accrued lease expense.

Impacts of adoption

IFRS 16 will affect primarily the accounting for the Company’s operating leases, except for short-term and low value leases, since the Company will adopt the practical expedients permitted by IFRS 16 and will recognize both as an expense in the income statement.

The Company expects to recognize lease liabilities and right-of-use assets in the amount of approximately USD 46,618. Net current assets will be USD 18,379 lower due to the presentation of a portion of the liability as a current liability. The Company expects that income before income tax will decrease by approximately USD 1,413 for 2019 as a result of adopting the new rules. Adjusted EBITDA used to measure segment results is expected to increase by approximately USD 17,654, as the operating lease payments were included in EBITDA, but the amortization of the right-of-use assets and interest on the lease liability are excluded from this measure.

IFRIC 23 - Uncertainty over income tax treatments

Nature of change

The interpretation explains how to recognize and measure deferred and current income tax assets and liabilities where there is uncertainty over a tax treatment. Specifically, it discusses:

- how to determine the appropriate unit of account, and that each uncertain tax treatment should be considered separately or together as a group, depending on which approach better predicts the resolution of the uncertainty;
- that the entity should assume a tax authority will examine the uncertain tax treatments and have full knowledge of all related information;
- that the entity should reflect the effect of the uncertainty in its income tax accounting when it is not probable that the tax authorities will accept the treatment;
- that the impact of the uncertainty should be measured using either the most likely amount or the expected value method, depending on which method better predicts the resolution of the uncertainty; and

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- that the judgements and estimates made must be reassessed whenever circumstances have changed or there is new information that affects the judgements.

Transaction

The Company will apply the standard from its mandatory adoption date of January 1, 2019.

Impacts of adoption

The Company expects that the impact of the adoption will not be material.

4 Changes in accounting estimates - Rights to use natural resources

In accordance with its accounting policy, the Company reviews the estimated useful lives and the pattern of consumption of the future economic benefits of its intangible assets on an ongoing basis. This review indicated a change in future pattern of consumption over its “Rights to use natural resources”, which is substantially related to an increase in extraction experience of the Company’s mines, updates in the extraction period and expected changes in extraction volume at the end of the mining life.

As a result, effective April 1, 2018, the Company changed the amortization of “Rights to use natural resources” from the straight-line method to the units of production method, in accordance with Note 14. This change has been accounted for prospectively as a change in accounting estimate in accordance with IAS 8 — “Accounting policies, Changes in Accounting Estimates and Errors”.

The effect of this change in estimate was not material for the fiscal year ended December 31, 2018.

5 Financial risk management

5.1 Financial risk factors

The Company’s activities expose it to a variety of financial risks: a) market risk (including currency risk, interest rate risk and commodities risk); b) credit risk; and c) liquidity risk.

A significant portion of the products sold by the Company are commodities, with prices pegged to international indices and denominated in US Dollars. Part of the costs of production, however, is denominated in Brazilian Reais and Peruvian Soles, and therefore, there is a mismatch of currencies between revenues and costs. Additionally, the Company has debts linked to different indices and currencies, which may impact its cash flows.

In order to mitigate the potential adverse effects of each financial risk factor, the Company follows a Financial Risk Management Policy that establishes governance and guidelines for the financial risk management process, as well as metrics for measurement and monitoring. This policy establishes guidelines and rules for: (i) Commodities Exposure Management, (ii) Foreign Exchange Exposure Management, (iii) Interest Rate Exposure Management, (iv) Issuers and Counterparties Risk Management, and (v) Liquidity and Financial Indebtedness Management. All strategies and proposals must comply with the Financial Risk Management Policy guidelines and rules, be presented to and discussed with the Finance Committee of the board of directors, and, when applicable, submitted for the approval of the Board of Directors, under the governance structure described in the Financial Risk Management Policy.

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(a) Market risk

The purpose of the market risk management process is to protect the Company's cash flow against adverse events, such as changes in foreign exchange rates, commodity prices and interest rates.

(i) Foreign exchange risk

Foreign exchange risk is managed through the Company's Financial Risk Management Policy, which states that the objectives of derivative transactions are to reduce cash flow volatility, hedge against foreign exchange exposure and minimize currency mismatches.

The US Dollar is NEXA's functional currency, and all actions related to the market risk management process are intended to protect cash flows in this currency, maintain the ability to pay financial obligations, and comply with liquidity and indebtedness levels defined by management.

Presented below are the financial assets and liabilities in foreign currencies at December 31, 2018 — these mainly result from the foreign operations of NEXA BR for which the functional currency is the Brazilian Real.

USD amounts of foreign currency transactions	2018	2017
Assets		
Cash, cash equivalents and financial investments	140,860	229,877
Derivative financial instruments	11,205	4,280
Trade accounts receivable	39,000	66,834
	<u>191,065</u>	<u>300,991</u>
Liabilities		
Loans and financing	123,471	161,706
Derivative financial instruments	14,222	3,634
Trade payables	4,689	78,286
	<u>142,382</u>	<u>243,626</u>
Net exposure	48,683	57,365

(ii) Interest rate risk

The Company's interest rate risk arises mainly from long-term loans. Loans at variable rates expose the Company to cash flow interest rate risk. Loans at fixed rates expose the Company to fair value risk associated with interest rates. For further information related to interest rates, refer to Note 15.

The Company's Financial Risk Management Policy establishes guidelines and rules to hedge against changes in interest rates that impact the cash flows of the Company. Exposure to each interest rate is projected until the maturity of the assets and liabilities exposed to this index.

Occasionally the Company enters into floating to fixed interest rate swaps to manage its cash flow interest rate risk.

(iii) Commodity price risk

This risk is related to the volatility in the prices of the Company's commodities. Prices fluctuate depending on demand, production capacity, producers' inventory levels, the commercial strategies adopted by large producers, and the availability of substitutes for these products in the global market.

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The Company's Financial Risk Management Policy establishes guidelines to mitigate the risk of fluctuations in commodity prices that could impact the cash flows of the Company. The exposure to the price of each commodity considers the monthly projections of production, purchases of inputs and the maturity flows of hedges associated with them.

Commodity prices hedge transactions are classified into the following hedging strategies:

Hedges for sales of zinc at a fixed price (Customer Hedge)

The objective is to convert fixed prices sales to floating London Metal Exchange (LME) prices. The purpose of the strategy is to maintain the revenues of a business unit linked to the LME prices. These transactions usually relate to purchases of zinc for future settlement on the over-the-counter market.

Hedges for mismatches of quotational periods (Book Hedges)

The objective is to hedge quotational periods mismatches arising between the purchases of metal concentrate or processed metal and the sale of the processed metal. These transactions usually relate to purchases and sales of zinc and silver for future trading on the over-the-counter market.

Hedges for the operating margin of metals (Strategic Hedges)

The objective is to reduce the volatility of the cash flow from LME prices for zinc, copper and silver and ensure a more predictable operating margin. This strategy is carried out through the sale of zinc forward contracts. For NEXA BR, the transaction also involves the sale of US dollars forward contracts in order to hedge the operating margin in Brazilian reais.

(b) Credit risk

Trade receivables, derivative financial instruments, term deposits, bank deposit certificates ("CDBs") and repurchase transactions backed by debentures and government securities create exposure to credit risk with respect to the counterparties and issuers. The Company has a policy of making deposits in financial institutions that have, at least, a rating from two of the following international rating agencies: Fitch, Moody's or Standard & Poor's. The minimum rating required for counterparties is A+/A1 (local rating scale) or BBB-/Baa3 (global rating scale). In the specific case of financial institutions in Peru where only global rating assessments are available, it will be eligible provided it has a rating of "BBB-" at least by one rating agency.

The pre-settlement risk methodology is used to assess counterparty risks in derivative transactions. This methodology consists of determining the risk associated with the likelihood (via Monte Carlo simulations) of a counterparty defaulting on the financial commitments defined by contract.

The global ratings were obtained from the rating agencies Standard & Poor's, Moody's and Fitch ratings and are related to commitments in foreign or local currency and, in both cases, they assess the capacity to honor these commitments, using a scale applicable on a global basis. Therefore, both ratings in foreign currency and in local currency are internationally comparable ratings.

The ratings used by the Company are always the most conservative ratings of the referred agencies.

In the case of credit risk arising from customer credit exposure, the Company assesses the credit quality of the customer, considering mainly the history of the relationship and financial indicators

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defining individual credit limits, which are continuously monitored.

The Company performs initial analyses of customer credit and, when deemed necessary, guarantees or letters of credit are obtained to mitigate the credit risk. Additionally, most sales to the United States of America, Europe and Asia are collateralized by letters of credit and credit insurance.

The following table reflects the credit quality of issuers and counterparties for transactions involving cash and cash equivalents, financial investments and derivative financial instruments:

	2018			2017		
	Local rating	Global rating	Total	Local rating	Global rating	Total
Cash and cash equivalents						
AAA	1,484	—	1,484	—	—	—
AA+	861	—	861	1,089	—	1,089
AA	24	78,245	78,269	—	—	—
AA-	—	20,179	20,179	—	115,269	115,269
A+	—	178,730	178,730	—	172,052	172,052
A	—	361,484	361,484	—	235,445	235,445
A-	—	29,162	29,162	3	86,189	86,192
BBB+	—	181,411	181,411	—	96,436	96,436
BBB	—	20,245	20,245	—	110,733	110,733
BBB-	—	83,919	83,919	—	—	—
No rating	3	77,191	77,194	—	201,821	201,821
	<u>2,372</u>	<u>1,030,566</u>	<u>1,032,938</u>	<u>1,092</u>	<u>1,017,945</u>	<u>1,019,037</u>
Financial investments						
AAA	51,913	—	51,913	—	—	—
AA+	10,840	—	10,840	17,111	—	17,111
AA	24,965	—	24,965	—	—	—
AA-	—	—	—	180,127	4,238	184,365
A-	—	—	—	5,053	—	5,053
No rating	4,515	—	4,515	—	18	18
	<u>92,233</u>	<u>—</u>	<u>92,233</u>	<u>202,291</u>	<u>4,256</u>	<u>206,547</u>
Derivative financial instruments						
AAA	3,749	—	3,749	—	—	—
AA	—	2,164	2,164	—	—	—
AA-	—	—	—	4,769	3,634	8,403
A+	—	5,275	5,275	—	3,141	3,141
A	—	17	17	—	233	233
	<u>3,749</u>	<u>7,456</u>	<u>11,205</u>	<u>4,769</u>	<u>7,008</u>	<u>11,777</u>
	<u>98,354</u>	<u>1,038,022</u>	<u>1,136,376</u>	<u>208,152</u>	<u>1,029,209</u>	<u>1,237,361</u>

(c) Liquidity risk

This risk is managed through the Company's Financial Risk Management Policy, which aims to ensure the availability of sufficient net funds to meet the Company's financial commitments. The main liquidity measurement and monitoring instrument is the cash flow projection, using a minimum projection period of 12 months from the benchmark date.

The table below analyzes the Company's financial liabilities to be settled by the Company based on their maturity (the remaining period from the balance sheet up to the contractual maturity date).

The amounts below represent the estimated undiscounted future cash flow, which include interest to be incurred and, accordingly, do not reconcile directly with the amounts presented in the consolidated balance sheet.

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	Less than 1 year	Between 1 and 3 years	Between 3 and 5 years	Over 5 years	Total
At December 31, 2018					
Loans and financing	91,890	261,186	619,958	897,701	1,870,735
Derivative financial instruments	8,663	4,954	605.00	—	14,222
Trade payables	387,225	—	—	—	387,225
Confirming payable	70,411	—	—	—	70,411
Salaries and payroll charges	58,166	—	—	—	58,166
Related parties	63	1,517	—	—	1,580
Provisions - Asset Retirement Obligation	12,283	40,171	36,561	198,061	287,075
Use of public assets	1,411	3,092	3,485	33,658	41,646
	<u>630,775</u>	<u>310,920</u>	<u>660,609</u>	<u>1,129,420</u>	<u>2,731,723</u>
At December 31, 2017					
Loans and financing	102,294	373,324	236,927	1,228,474	1,941,018
Derivative financial instruments	12,588	2,449	—	—	15,037
Trade payables	329,814	—	—	—	329,814
Confirming payable	111,024	—	—	—	111,024
Salaries and payroll charges	79,798	—	—	—	79,798
Dividends payable	4,138	—	—	—	4,138
Related parties	87,686	2,238	—	—	89,924
Provisions - Asset Retirement Obligation	7,526	53,429	33,186	237,788	331,929
Use of public assets	1,740	3,755	4,233	45,309	55,037
	<u>736,607</u>	<u>435,195</u>	<u>274,346</u>	<u>1,511,571</u>	<u>2,957,719</u>

5.2 Capital management

The Company is subject to financial covenants on its loans and financing. The compliance with the financial covenants is verified by using the gearing ratio, calculated as net debt divided by Adjusted EBITDA.

Net debt is defined as (i) loans and financing, less (ii) cash and cash equivalents, less (iii) financial investments, plus or minus (iv) the fair value of derivative financial liabilities or assets, respectively. Adjusted EBITDA for capital management calculation uses the same assumptions described in Note 1 for Adjusted EBITDA by segment.

Net debt and Adjusted EBITDA measures should not be considered in isolation or as a substitute for net income or operating income, as indicators of operating performance, or as alternatives to cash flow as measures of liquidity. Additionally, management's calculation of Adjusted EBITDA may be different from the calculation used by other companies, including competitors in the mining and smelting industry, so these measures may not be comparable to those of other companies.

The gearing ratio is as follows:

	Note	2018	2017	2016
Loans and financing	15	1,424,867	1,447,299	1,144,385
Cash and cash equivalents	8	(1,032,938)	(1,019,037)	(915,576)
Derivative financial instruments	6	3,017	3,260	16,718
Financial investments	9	(92,233)	(206,547)	(119,498)
Net debt		<u>302,713</u>	<u>224,975</u>	<u>126,029</u>
Net income for the year		90,976	165,265	110,509
Plus (less):				
Share in the results of associates		—	(60)	158
Depreciation and amortization	13 and 14	267,189	270,454	275,034
Net financial results	26	202,654	130,181	(79,081)
Income tax	18	40,923	106,194	98,383
EBITDA		<u>601,742</u>	<u>672,034</u>	<u>405,003</u>
Exceptional items	1 (i)	3,050	(4,515)	(1,079)
Adjusted EBITDA		<u>604,792</u>	<u>667,519</u>	<u>403,924</u>
Gearing ratio (Net Debt/Adjusted EBITDA)		<u>0.50</u>	<u>0.34</u>	<u>0.31</u>

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5.3 Fair value estimates

Critical accounting estimates and judgments

The fair value of financial instruments that are not traded in an active market is determined using valuation techniques. The Company uses judgment to select among a variety of methods and makes assumptions that are mainly based on market conditions existing at the end of each reporting period.

(a) Analysis

The carrying amounts of trade accounts receivable, less impairment losses, confirming payables and advances from customers approximate their fair values. The fair value of loans and financing for disclosure purposes are estimated by discounting the future contractual cash flow at the current market interest rate and adjusted for the Company's credit risk.

The main financial instruments and the assumptions made by the Company for their valuation are described below:

- Cash and cash equivalents, financial investments, trade accounts receivable and other current assets - considering their nature, terms and maturity, the carrying amounts approximate their fair value.
- Financial liabilities - these instruments are subject to the usual market interest rates. The fair value was based on the present value of expected future cash disbursement, at interest rates currently available for debt with similar maturities and terms and adjusted for the Company's credit risk.
- Derivative financial instruments — the fair value of the derivative financial instruments is determined by calculating their present value through yield curves at the closing dates. The curves and prices used in the calculation for each group of instruments are developed based on data from Brazilian Securities, Commodities and Futures Exchange - B3, Central Bank of Brazil, LME and Bloomberg, interpolated between the available maturities.
 - Swap contracts - the present value of both the assets and liabilities are calculated through the discount of forecasted cash flow by the interest rate of the currency in which the swap is denominated. The difference between the present value of the assets and the liabilities generates its fair value.
 - Forward contracts — the present value is estimated by discounting the notional amount multiplied by the difference between the future price at the reference date and the contracted price. The future price is calculated using the convenience yield of the underlying asset. It is common to use Asian non-deliverable forwards for hedging non-ferrous metals positions. Asian contracts are derivatives in which the underlying is the average price of certain asset over a range of days.
 - Option contracts - the present value is estimated based on Black model, with assumptions that include the underlying asset price, strike price, volatility, time to maturity and interest rate. The underlying asset price is the average price of the foreign exchange rate in the fixing month.

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(b) Fair value hierarchy

Financial assets and financial liabilities recognized and measured at fair value were classified as Level 1 and 2 in the fair value measurement hierarchy, as follows:

	Note	Level 1	Level 2	Total fair value
Assets				
Cash and cash equivalents	8	1,032,938	—	1,032,938
Financial investments	9	39,167	53,065	92,233
Derivative financial instruments	6	—	11,205	11,205
Trade accounts receivables	10	—	151,058	151,058
		1,072,105	215,328	1,287,434
Liabilities				
Derivative financial instruments	6	—	14,222	14,222
		—	14,222	14,222
2017				
	Note	Level 1	Level 2	Total fair value
Assets				
Cash and cash equivalents	8	1,019,037	—	1,019,037
Financial investments	9	134,168	72,379	206,547
Derivative financial instruments	6	—	11,777	11,777
Trade accounts receivables	10	—	62,693	62,693
		1,153,205	146,849	1,300,054
Liabilities				
Derivative financial instruments	6	—	15,037	15,037
		—	15,037	15,037

The Company discloses fair value measurements based on their level of the following fair value measurement hierarchy:

Level 1:

Quoted prices (unadjusted) in active markets for identical assets and liabilities traded in active markets at the balance sheet date. A market is regarded as active if quoted prices are readily and regularly available from an exchange, dealer, broker, industry group, pricing service, or regulatory agency, and those prices represent actual and regularly occurring market transactions on an arm's length basis. The quoted market price used for financial assets held by the Company is the current bid price.

Level 2:

Financial instruments not traded in an active market for which fair value is determined using valuation techniques, when all of the significant inputs required to identify the fair value of an instrument are observable. Specific valuation techniques used to value financial instruments include:

- Quoted market prices or dealer quotes for similar instruments are used where available;
- The fair values of interest rate swaps are calculated at the present value of the estimated future cash flow based on observable yield curves; and
- The fair value of forward foreign exchange contracts is determined using forward exchange rates at the balance sheet date, with the resulting value discounted to present value.

Other techniques, such as discounted cash flow analysis, are used to determine the fair value for the remaining financial instruments.

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Level 3:

Inputs for the asset or liability that are not based on observable market data (that is, unobservable inputs) are classified as Level 3. As of December 31, 2018, there were not any financial assets and liabilities carried at fair value classified as Level 3.

6 Derivative financial instruments

Accounting policy

Derivatives are initially recognized at fair value as at the date on which a derivative contract is entered into and are subsequently measured at fair value. Derivatives are only used for risk mitigation purposes and not as speculative investments. When derivatives do not meet the hedge accounting criteria, they are classified as held for trading and accounted for at fair value through profit or loss.

The Company documents at the inception of the hedging transaction the relationship between hedging instruments and hedged items, as well as its risk management objectives and strategy for undertaking the hedge transactions. The Company also documents its assessment, both at hedge inception and on an ongoing basis, whether the derivatives that are used in hedging transactions and accounted for as hedge accounting were, and will continue to be, highly effective in offsetting changes in the fair value or cash flow of hedged items.

(i) Cash flow hedge

Derivatives that are designated for hedge accounting recognition are qualified as cash flow hedges when they are related to a highly probable forecasted transaction. The effective portion of the changes in fair value is recognized in shareholders' equity in "Accumulated other comprehensive income (loss)" and is subsequently reclassified to the income statement in the same period when the hedged expected cash flows affect the income statement.

The reclassification adjustment is recognized in the same income statement line item affected by the highly probable forecasted transaction, while gains or losses related to the non-effective portion are immediately recognized as "Other income and expenses, net".

When a hedging instrument expires, is sold or no longer meets the criteria for hedge accounting, any cumulative gain or loss existing in shareholders' equity at that time remains in shareholders' equity and is recognized when the forecast transaction is ultimately recognized in the income statement. When a forecasted transaction is no longer expected to occur, the cumulative gain or loss that was previously accounted in shareholders' equity is immediately transferred to the income statement within "Other income and expenses, net".

(ii) Fair value hedge

Derivatives that are designated for hedge accounting are qualified as fair value hedges when they are related to assets or liabilities already recognized in the consolidated balance sheet. Changes in the fair values of derivatives that are designated and qualify as fair value hedges and changes in the fair value of the hedged item are recorded in the income statement in the same period.

(iii) Derivatives not designated as hedging instruments

Changes in the fair value of derivative financial instruments not designated as hedging instruments are recognized immediately in the income statement within "Other income and expenses, net"

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when related to price risk and within “Net financial results” when related to interest rate or foreign exchange rate risk.

This category includes derivatives contracts entered into in November 2018 by the Company to mitigate its exposure to the foreign currency risk associated with changes in the Brazilian real exchange rate for the majority of the estimated capital expenditures of the Aripuanã project. The transaction involved the purchase of collars in the notional amount of USD 294 million (BRL 1,057 million) which relates to the estimated Aripuanã’s disbursements from 2019 to 2021.

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The table below summarizes the derivative financial instruments, the underlying hedged items and the hedge accounting derivatives operations as at December 31, 2018:

Strategy	Notional		Per Unit	Fair Value - December 31, 2017	Changes in fair value					Realized gain (loss) 2018	Fair Value - December 31, 2018	Fair value by maturity		
	2018	2017			Inventory	Net revenues	Other income and expenses, net	Net financial results	Other comprehensive income			2019	2020	2021
Hedges for mismatches of quotational periods														
Zinc forward	261,020	387,240	ton	(4,638)	3,038	(1,353)	20,460	—	(968)	17,096	(557)	(557)	—	—
Silver forward	—	503	k oz	129	—	—	159	—	67	355	—	—	—	—
				(4,508)	3,038	(1,353)	20,618	—	(901)	17,451	(557)	(557)	—	—
Hedges for sales of zinc at a fixed price														
Zinc forward	10,566	2,230	ton	603	—	—	(3,090)	—	—	(1,629)	(858)	(815)	(43)	—
				603	—	—	(3,090)	—	—	(1,629)	(858)	(815)	(43)	—
Interest rates risk														
LIBOR floating rate vs. USD fixed rate swaps	—	31,393	USD	646	—	—	—	(936)	—	(290)	—	—	—	—
				646	—	—	—	(936)	—	(290)	—	—	—	—
Foreign exchange risk														
Collars foreign exchange (USD)	1,056,922	—	BRL	—	—	—	—	(1,602)	—	—	(1,602)	95	(1,431)	(266)
				—	—	—	—	(1,602)	—	—	(1,602)	95	(1,431)	(266)
				(3,260)	3,038	(1,353)	17,528	(2,538)	(901)	15,532	(3,017)	(1,276)	(1,474)	(266)

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6.1 Sensitivity analysis

Presented below is a sensitivity analysis of the main risk factors that affect the pricing of the outstanding financial instruments relating to cash and cash equivalents, financial investments, loans and financing, and derivative financial instruments. The main sensitivities are the exposure to changes of the US Dollar exchange rate, the London Interbank Offered Rate (LIBOR) and Interbank Deposit Certificate (CDI) interest rates, the US Dollar coupon and the commodity prices. The scenarios for these factors are prepared using market sources and other relevant sources, in compliance with the Company's policies.

The scenarios at December 31, 2018 are described below:

- Scenario I: considers a change in the market forward yield curves and quotations as of December 31, 2018, according to the base scenario defined by the Company for March 31, 2019.
- Scenario II: considers a change of + or -25% in the market forward yield curves as of December 31, 2018.
- Scenario III: considers a change of + or -50% in the market forward yield curves as of December 31, 2018.

Risk factor	Cash and cash equivalents and financial investments	Loans and financing	Notional of derivative financial instruments	Unit	Impacts on income statement								Impacts on statement of comprehensive income				
					Scenario I			Scenarios II e III					Scenario I		Scenarios II e III		
					Quotation at December 31, 2018	Changes from 2018	Results of scenario I	-25%	-50%	+25%	+50%	Results of scenario I	-25%	-50%	+25%	+50%	
Foreign exchange rates																	
BRL	94,603	123,471	293,589	USD	0.2581	0.64%	703	63,484	230,801	(24,677)	(52,495)	(48)	(2,278)	(7,245)	1,695	2,689	
PEN	43,601	—	—	PEN	1.1482	1.00%	112	(2,813)	(5,626)	2,813	5,626	—	—	—	—	—	
Interest rates																	
BRL - CDI	93,093	27,724	1,056,922	BRL	6.40%	16bps	(183)	2,336	4,870	(2,180)	(4,243)	—	—	—	—	—	
USD - LIBOR	—	—	681,817	USD	2.81%	-6bps	(0)	(5)	(11)	5	10	—	(4)	(8)	4	9	
US Dollar coupon	—	—	293,589	USD	3.31%	26bps	(394)	(1,627)	(3,280)	1,614	3,225	—	—	—	—	—	
Price - commodities																	
Zinc	—	—	271,586	mt	2,511	1.57%	(1,919)	30,499	60,999	(30,499)	(60,999)	466	(7,401)	(14,802)	7,401	14,802	

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6.2 Value and type of margins pledged in guarantee

Derivative transactions entered into by the Company are not subject to collateral deposits, margin calls or any other type of guarantee.

7 Financial instruments by category

Accounting policy

Normal purchases and sales of financial assets are recognized on the trade date — the date on which the Company commits to purchase or sell the asset. Financial assets are initially recognized at fair value plus transaction costs for all financial assets not carried at fair value through profit or loss. Financial assets carried at fair value through profit or loss, if any, are initially recognized at fair value, and transaction costs are expensed in the income statement.

Financial assets are derecognized when the rights to receive cash flow from the investments have expired or the Company has transferred substantially all of the risks and rewards of ownership. Financial assets at fair value through profit or loss and at fair value through other comprehensive income are subsequently carried at fair value. Financial assets at amortized costs are subsequently measured using the effective interest rate method.

Gains or losses arising from changes in the fair value of the financial assets classified as fair value through profit or loss are presented in the income statement under “Net financial results” in the year in which they arise.

The Company classifies its financial assets under the following categories: amortized cost, fair value through other comprehensive income and fair value through profit or loss. The classification depends on the purpose for which the financial assets were acquired. Management determines the classification of the Company’s financial assets upon initial recognition.

(i) Amortized cost

Financial assets measured at amortized cost are assets held within a business model whose objective is to hold financial assets in order to collect contractual cash flows and for which the contractual terms of the financial asset give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding.

(ii) Fair value through profit or loss

Financial assets measured at fair value through profit or loss are assets which an entity manages with the objective of realizing cash flows through the sale of such assets and financial assets that do not give rise to cash flows that are solely payments of principal and interest on the principal amount outstanding.

(iii) Fair value through other comprehensive income

Financial assets measured at fair value through other comprehensive income are held within a business model whose objective is achieved by both collecting contractual cash flows and selling financial assets and for which the contractual terms of the financial asset give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding.

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Analysis

2018					
	Note	Amortized cost	Fair value through profit or loss	Fair value through other comprehensive income	Total
Assets per balance sheet					
Cash and cash equivalents	8	—	1,032,938	—	1,032,938
Financial investments	9	—	92,233	—	92,233
Derivative financial instruments	6	—	6,885	4,320	11,205
Trade accounts receivable	10	22,146	151,058	—	173,204
Related parties	12	740	—	—	740
		22,886	1,283,114	4,320	1,310,320
Liabilities per balance sheet					
Loans and financing	15	1,424,867	—	—	1,424,867
Derivative financial instruments	6	—	10,155	4,068	14,222
Trade payables		387,225	—	—	387,225
Confirming payable	16	70,411	—	—	70,411
Use of public assets		22,126	—	—	22,126
Related parties	12	1,580	—	—	1,580
		1,906,209	10,155	4,068	1,920,431
2017					
	Note	Amortized cost	Fair value through profit or loss	Fair value through other comprehensive income	Total
Assets per balance sheet					
Cash and cash equivalents	8	—	1,019,037	—	1,019,037
Financial investments	9	—	206,547	—	206,547
Derivative financial instruments	6	—	8,811	2,966	11,777
Trade accounts receivable	10	120,020	62,693	—	182,713
Related parties	12	738	—	—	738
		120,758	1,297,088	2,966	1,420,812
2017					
	Note	Amortized cost	Fair value through profit or loss	Fair value through other comprehensive income	Total
Liabilities per balance sheet					
Loans and financing	15	1,447,299	—	—	1,447,299
Derivative financial instruments	6	—	12,842	2,195	15,037
Trade payables		329,814	—	—	329,814
Confirming payable	16	111,024	—	—	111,024
Use of public assets		24,309	—	—	24,309
Related parties	12	89,924	—	—	89,924
		2,002,370	12,842	2,195	2,017,407

8 Cash and cash equivalents

Accounting policy

Cash and cash equivalents includes cash, bank deposits, and highly liquid short-term investments (investments with an original maturity less than 90 days), which are readily convertible into a known amount of cash and subject to an immaterial risk of changes in value. Bank overdrafts are shown within loans and financing in current liabilities in the balance sheet.

(a) Composition

	2018	2017
Cash and banks	320,069	319,920
Term deposits	712,869	699,117
	1,032,938	1,019,037

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(b) Changes in operating assets and liabilities

The operational cash flow impact due to the changes in operating assets and liabilities is presented below:

	2018	2017	2016
Decrease (increase) in assets			
Trade accounts receivable	8,537	(63,172)	(54,188)
Inventory	52,472	(15,675)	(62,586)
Other assets	(70,101)	23,256	9,144
Increase (decrease) in liabilities			
Trade payables	57,411	47,573	9,557
Confirming payable	(40,613)	8,737	5,743
Salaries and payroll charges	(21,632)	9,776	25,206
Contractual liabilities	(29,543)	(36,299)	250,000
Related parties	27,167	—	—
Other liabilities	26,877	(59,348)	(1,809)
	10,575	(85,152)	181,067

9 Financial investments

Accounting policy

Financial investments are mainly short-term investments that do not meet the definition of cash and cash equivalents. The financial investments are used as part of the cash-management strategy of the Company and are measured at fair value through profit or loss.

(a) Composition

	2018	2017
Investment fund quotas (i)	38,677	138,945
Bank deposit certificate	44,595	42,067
Repurchase agreements	—	18,289
Other	8,961	7,246
	92,233	206,547

- (i) The investment fund is exclusively held by VSA and its subsidiaries. The fund's portfolio is comprised of repurchase agreements and treasury bills.

10 Trade accounts receivable

Accounting policy

Trade accounts receivable are amounts due from customers for goods sold in the ordinary course of the Company's business.

Trade accounts receivable are recognized initially at fair value and subsequently measured at:

(i) Fair value through profit or loss when related to the Company's accounts receivable portfolio that is included in a true sale program whereby the Company, at its discretion, can discount certain outstanding trade accounts receivables and receive payments in advance. The program is used to meet short-term liquidity needs. Trade accounts receivable within this program are derecognized since the contractual rights to receive the cash flows of the assets are transferred to the counterparty.

(ii) Fair value through profit or loss when related to sales that are subsequently adjusted to changes of LME prices. These accounts receivable do not meet the solely payments of principal and interest (SPPI) criteria because there is a component of commodity price risk that modifies the cash flows that otherwise would be required by the sales contract.

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(iii) Amortized cost using the effective interest rate method, less impairment, when the receivable do not meet the aforementioned classification.

Credit risk can arise from non-performance by counterparties of their contractual obligations to the Company. To ensure an effective evaluation of credit risk, management applies procedures related to the application for credit granting and approvals, renewal of credit limits, continuous monitoring of credit exposure in relation to established limits and events that trigger requirements for secured payment terms. As part of the Company's process, the credit exposures with all counterparties are regularly monitored and assessed.

The Company applied the IFRS 9 simplified approach to measure the impairment losses for trade accounts receivable. This approach requires the use of the lifetime expected credit losses on its trade accounts receivable measured at amortized cost. To calculate the lifetime expected credit losses the Company used a provision matrix and forward-looking information.

The additions to impairment of trade accounts receivable are included in selling expenses. Trade accounts receivable are generally written off when there is no expectation of recovering additional cash.

In 2017 and 2016, the impairment of trade accounts receivable was based on the incurred loss model.

(a) Composition

	Note	2018	2017
Trade accounts receivables		174,931	181,084
Related parties	12	963	3,775
Impairment of trade accounts receivable		(2,690)	(2,146)
		173,204	182,713

(b) Changes in impairment of trade accounts receivable

	2018	2017
Balance at the beginning of the year	(2,146)	(1,618)
Additions	(1,238)	(3,300)
Reversals	428	2,779
Foreign exchange gains (losses)	266	(7)
Balance at the end of the year	(2,690)	(2,146)

(c) Analysis by currency

	2018	2017
Brazilian Real	39,000	66,486
US Dollar	133,689	115,879
Other	515	348
	173,204	182,713

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(d) Aging of trade accounts receivable

	2018	2017
Current	146,064	163,196
Up to 3 months past due	28,366	19,775
From 3 to 6 months past due	455	914
Over 6 months past due	1,009	974
	<u>175,894</u>	<u>184,859</u>
Impairment	(2,690)	(2,146)
	<u>173,204</u>	<u>182,713</u>

11 Inventory

Accounting policy

Inventory is stated at the lower of cost and net realizable value. Cost is determined using the weighted average cost method. The cost of finished goods and work in progress comprises raw materials, direct labor, other direct costs and related fixed production overheads (based on normal operating capacity). Variable production overhead costs are included in inventory cost on the basis of actual level of production. The net realizable value is the estimated selling price in the ordinary course of business, less any additional selling expenses. Imports in transit are stated at the accumulated cost of each import. A provision for obsolete inventory - finished products, semi-finished products, raw materials and auxiliary materials - is recognized when items cannot be used in normal production or sold because they are damaged or do not meet the Company's specification. Slow-moving provision is recognized for inventory items that are in excess of the expected normal use or sale. The amount of slow-moving provision recognized is determined on the basis of 20% of the carrying amount for each six-month period without use or sale.

(a) Composition

	2018	2017
Finished products	106,245	106,026
Semi-finished products	52,534	85,458
Raw materials	52,864	30,128
Auxiliary materials and consumables	69,566	81,261
Imports in transit	11,718	41,878
Other	215	863
Provision for obsolete and slow-moving inventory	(23,437)	(20,736)
	<u>269,705</u>	<u>324,878</u>

The Company had no inventory pledged as collateral for any of its liabilities.

Inventories recognized as an expense during the year ended December 31, 2018 amounted to USD 1,701,456 (2017: USD 1,320,379; 2016: USD 1,287,662). These were included in Cost of sales.

(b) Changes in the provision for obsolete and slow-moving inventory

	2018				2017	
	Finished products	Semi- finished products	Raw materials	Auxiliary materials and consumables	Total	Total
Balance at the beginning of the year	(40)	(10,019)	(214)	(10,463)	(20,736)	(38,384)
Additions	(32)	(1,363)	(17)	(11,291)	(12,703)	(1,814)
Reversals	41	8,701	207	311	9,260	19,249
Exchange variation gains (losses)	3	959	18	(238)	742	213
Balance at the end of the year	<u>(28)</u>	<u>(1,722)</u>	<u>(6)</u>	<u>(21,681)</u>	<u>(23,437)</u>	<u>(20,736)</u>

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12 Related parties

	Trade accounts receivable		Related parties (assets)		Trade payables		Dividends payable		Related parties (liabilities)	
	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017
Parent										
Votorantim S.A. (i) (ii)	—	8	3	3	478	336	—	—	—	87,686
Related parties										
Companhia Brasileira de Alumínio	214	1,843	—	—	—	5,246	—	—	12	13
Votorantim Cimentos S.A.	623	1,696	737	735	85	47	—	—	—	—
Votener - Votorantim Comercializadora de Energia Ltda.	—	—	—	—	2,060	—	—	—	—	—
Other	126	228	—	—	785	1,414	663	4,138	1,568	2,225
	963	3,775	740	738	3,408	7,043	663	4,138	1,580	89,924
Current	963	3,775	—	—	3,408	7,043	663	4,138	63	87,686
Non-current	—	—	740	738	—	—	—	—	1,517	2,238
	963	3,775	740	738	3,408	7,043	663	4,138	1,580	89,924

	Sales			Purchases			Financial results		
	2018	2017	2016	2018	2017	2016	2018	2017	2016
Parent									
Votorantim S.A. (ii)	—	—	—	3,649	3,651	4,653	—	—	—
Related parties									
Companhia Brasileira de Alumínio	39	2,125	70	1,626	42,434	31,162	—	1,012	3,582
Votorantim Metais S.A.	—	—	—	—	—	51	—	—	3,583
Votener - Votorantim Comercializadora de Energia Ltda.	—	—	—	10,054	13,510	13,400	—	—	—
Votorantim Cimentos S.A.	173	138	45	365	365	273	—	—	—
Other	2,115	—	2,856	4,920	1,134	1,427	—	—	—
	2,327	2,263	2,971	20,614	61,094	50,966	—	1,012	7,165

- (i) On September 2018, the Brazilian Electricity Regulatory Agency (“ANEEL”) consented to the transfer of certain energy assets owned by NEXA BR to Pollarix. In accordance with the agreement between NEXA BR and VSA, after the approval, NEXA BR was required to settle a prior obligation of USD 87,623 (BRL 290,000) with VSA related to the rights to use these assets. In December 2018, NEXA BR paid this amount.
- (ii) The Company entered into an agreement with VSA on September 4, 2008, for services provided by the Center of Excellence (“CoE”) of VSA related to administrative activities, human resources, back office, accounting, taxes, technical assistance, training, among others. Under a cost sharing agreement, the Company reimburses VSA for the expenses related to these activities in respect of NEXA.

Nexa Resources S.A.**Notes to the consolidated financial statements****at December 31, 2018****All amounts in thousands of US dollars, unless otherwise stated****(a) Key management compensation**

Key management includes the members of the Company's global executive team and Board of Directors. Key management compensation, including all benefits, was as follows:

	2018	2017
Short-term benefits	7,225	6,668
Other long-term benefits	1,039	1,162
	8,264	7,830

Short-term benefits include fixed compensation, payroll charges and short-term benefits under the Company's variable compensation program. Other long-term benefits relate to the variable compensation program.

13 Property, plant and equipment**Accounting policy**

Property, plant and equipment are stated at the historical cost of acquisition or construction less accumulated depreciation and any recognized impairment losses. Historical cost includes expenditures that are directly attributable to the acquisition and construction of the assets.

Subsequent costs are included in the asset's carrying amount, or recognized as a separate asset as appropriate, only when it is probable that future economic benefits associated with the item will flow to the Company and they can be measured reliably. The carrying amount of any component accounted for as a separate asset is derecognized when replaced. All other repairs and maintenance are charged to the income statement during the reporting period in which they are incurred.

Replacement costs are included in the carrying amount of the asset when it is probable that the Company will realize future economic benefits in excess of the benefits expected from the asset in its current condition. Replacement costs are depreciated over the remaining useful life of the related asset.

Land is not depreciated. Depreciation of other assets is calculated using the straight-line method to reduce their costs to their residual values over their estimated useful lives.

The assets' residual values and useful lives are reviewed annually and adjusted if appropriate.

An asset's carrying amount is reduced to its recoverable amount when it is greater than the estimated recoverable amount, in accordance with the criteria adopted by the Company in order to determine the recoverable amount.

Gains and losses on disposals are determined by comparing the proceeds with the carrying amount and are recognized within "Other income and expenses, net" in the income statement.

Loans and financing costs directly related to the acquisition, construction or production of a qualifying asset that requires a substantial period of time to prepare for its intended use or sale are capitalized as part of the cost of that asset when it is probable that future economic benefits associated with the item will flow to the Company and costs can be measured reliably.

Stripping costs

In its surface mining operations, the Company must remove overburden and other waste to gain

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access to mineral ore deposits. The removal process is referred to as stripping. During the development of a mine, before production commences, when the stripping activity improves access to the ore body, the component of the ore body for which access has been improved can be identified and the costs can be measured reliably, a stripping activity asset is capitalized as part of the investment in the construction of the mine, accounted for as part of property, plant and equipment, and subsequently depreciated over the life of the mine on a units of production basis.

Stripping costs incurred during the production phase of operations are treated as a production cost that forms part of the cost of inventory.

Exploration and development costs

The Company incurs mineral exploration costs such as exploratory drilling, geological and geophysical studies in order to determine the mineral potential of a given area, which are expensed as incurred.

The Company uses the front-end loading (“FEL”) methodology for project and development management. Development scoping costs and pre-feasibility studies for greenfield and brownfield projects are expensed during FEL 1 and FEL 2 phases, together with research and development costs for the smelting segment, until the project has demonstrated technical feasibility and economic viability. Mining development costs are capitalized when the FEL 3 phase starts and the mineral potential and commercial viability of the project can be assessed reliably. Such costs include feasibility studies and engineering work. The development costs are assessed for impairment at least annually or whenever evidences indicate that the assets may be impaired.

Asset retirement obligation

An asset retirement obligation is an obligation related to the permanent removal from service of a tangible long-lived asset that results from the acquisition, construction or development, or the normal operations of a tangible long-lived asset. At the initial recognition of an asset retirement obligation and at the periodical revisions of the expected disbursements and the discount rate, the changes in the liability are charged to property, plant and equipment.

The capitalized amount recognized in property, plant and equipment is depreciated based on the useful life of the underlying asset. Any reduction in the provision that exceeds the carrying amount of the asset, is immediately recognized in the income statement as “Other income and expenses, net”.

Leases

Leases in which a significant portion of the risks and rewards of ownership are retained by the lessor are classified as operating leases. Payments made under an operating lease (net of any incentive received from the lessor) are charged to the income statement on a straight-line basis over the period of the lease.

Leases of property, plant and equipment, where the Company has substantially all the risks and rewards of ownership, are classified as finance leases. Finance leases are capitalized at the inception of the lease at the lower of the fair value of the leased item and the present value of the minimum lease payments and are depreciated over the shorter of the asset’s useful life and the lease term.

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Impairment of non-financial assets

The Company assesses, at each reporting date, whether there is an indicator that an asset or cash generating unit (“CGU”) may be impaired. If any indication exists, such as volumes and prices reductions or unusual events that can affect the business, the Company estimates the asset’s or CGU’s recoverable amount. The recoverable amount is the higher of an asset’s or CGU’s fair value less cost of disposal and its value in use. The recoverable amount is determined for an individual asset, unless the asset does not generate cash inflows that are largely independent of those from other assets or groups of assets, in which case, the asset is tested as part of a larger CGU to which it belongs. If the carrying amount of an asset or CGU exceeds its recoverable amount, the asset or CGU is considered impaired and is reduced to its recoverable amount. Non-financial assets other than goodwill that were adjusted due to impairment are subsequently reviewed for possible reversal of the impairment at each reporting date.

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(a) Analysis

	2018							
	Land and improvements	Dams and Buildings	Machinery, equipment and facilities	Assets and projects under construction	Asset retirement obligation	Mining projects	Other	Total
Balance at the beginning of the year								
Cost	24,490	1,030,686	2,422,254	235,501	178,662	243,938	35,055	4,170,586
Accumulated depreciation	(275)	(453,140)	(1,504,433)	—	(101,527)	(85,455)	(29,242)	(2,174,072)
Net balance	24,215	577,546	917,821	235,501	77,135	158,483	5,813	1,996,514
Additions (i)	—	2,613	2,878	294,229	—	—	53	299,773
Disposals	(638)	(3,207)	(6,985)	(1,148)	—	—	(53)	(12,031)
Depreciation	(19)	(48,072)	(131,099)	—	(4,592)	(1,931)	(1,752)	(187,465)
Foreign exchange (losses) gains	(2,160)	(42,117)	(58,574)	(28,827)	(9,688)	—	(477)	(141,843)
Transfers	(22)	63,562	78,485	(147,403)	—	173	1,214	(3,991)
Remeasurement of asset retirement obligation	—	—	—	—	20,777	—	—	20,777
Impairment (c)	—	—	—	(3,283)	—	—	—	(3,283)
Balance at the end of the year	21,376	550,325	802,526	349,069	83,632	156,725	4,798	1,968,451
Cost	21,629	1,002,885	2,357,254	349,069	175,506	243,629	29,513	4,179,485
Accumulated depreciation	(253)	(452,560)	(1,554,728)	—	(91,874)	(86,904)	(24,715)	(2,211,034)
Net balance at the end of the year	21,376	550,325	802,526	349,069	83,632	156,725	4,798	1,968,451
Average annual depreciation rates - %	—	4	7	—	5	8	—	—

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	2017							
	Land and improvements	Dams and buildings	Machinery, equipment and facilities	Assets and projects under construction	Asset retirement obligation	Mining projects	Other	Total
Balance at the beginning of the year								
Cost	24,036	980,242	2,466,265	219,254	132,824	271,466	36,503	4,130,590
Accumulated depreciation	(257)	(435,372)	(1,485,939)	—	(96,108)	(102,828)	(31,624)	(2,152,128)
Net balance	23,779	544,870	980,326	219,254	36,716	168,638	4,879	1,978,462
Additions (i)	46	100	5,761	185,688	4,303	240	579	196,717
Disposals	(930)	(92)	(2,915)	(6,917)	—	—	(128)	(10,982)
Depreciation	(22)	(34,175)	(142,519)	—	(5,834)	(11,121)	(1,766)	(195,437)
Foreign exchange (losses) gains	(231)	(4,309)	(6,381)	(3,965)	(1,839)	(2,115)	(118)	(18,958)
Transfers	1,573	71,152	83,297	(158,559)	—	2,841	2,367	2,671
Remeasurement of asset retirement obligation	—	—	—	—	43,789	—	—	43,789
Transfers of assets held for sale	—	—	252	—	—	—	—	252
Balance at the end of the year	24,215	577,546	917,821	235,501	77,135	158,483	5,813	1,996,514
Cost	24,490	1,030,686	2,422,254	235,501	178,662	243,938	35,055	4,170,586
Accumulated depreciation	(275)	(453,140)	(1,504,433)	—	(101,527)	(85,455)	(29,242)	(2,174,072)
Net balance at the end of the year	24,215	577,546	917,821	235,501	77,135	158,483	5,813	1,996,514
Average annual depreciation rates - %	—	4	7	—	5	8	—	—

(i) Additions include capitalized borrowing costs in the amount of USD 36,534 in 2018 (2017 — USD 35,164).

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(b) Assets and projects under construction

The balance mainly comprises projects for the expansion and optimization of the Company's plant and mines, as described below:

	2018	2017
Expansion and modernization projects	174,634	64,043
Sustaining projects	90,604	78,860
Health, safety and environment projects	63,406	73,611
Information technology projects	12,970	7,397
Other	7,456	11,590
	349,069	235,501

Aripuanã project - Approval of the construction

On October 19, 2018, after the conclusion of the feasibility study and detailed analysis by the Company's management, the Board of Directors approved the construction of the Aripuanã project, an underground polymetallic mine and concentrate processing facility in the state of Mato Grosso, Brazil. On December 20, 2018 the Environmental Authority of the State of Mato Grosso, Brazil granted the Installation License for the Aripuanã project, which enabled the Company to start the construction phase.

The Aripuanã project is estimated to be operational by the beginning of 2021, with total investment estimated at approximately USD 392,000. The Company owns a 70% interest in the Aripuanã project through its subsidiaries.

(c) Impairment of non-financial assets

The Company considered the decline in LME spot prices during 2018 as an impairment indicator and performed an impairment test for the CGUs of Juiz de Fora and Três Marias system, that were not covered by the annual goodwill impairment testing disclosed in the Note 14. The recoverable amount was estimated based on the value in use method, using the same key assumptions and calculation metrics defined in Note 14. No impairment was identified for these CGUs.

The Company also evaluated the assets and projects under construction and identified that the amount invested in some projects would not be recoverable. The amount of USD 3,283 was impaired and recognized in "Other income and expenses, net" in 2018.

14 Intangible assets

Accounting policy

Goodwill

Goodwill arising from business combinations is measured as the excess of the sum of the consideration transferred, the amount of any non-controlling interests in the acquiree, and the fair value of the acquirer's previously held equity interest in the acquiree (if any) over the net assets acquired. Goodwill is not amortized but is tested for impairment annually and whenever circumstances indicate that the carrying amount may not be recovered. The recoverable amount is the higher of an asset's fair value less costs to sell and its value in use. If either the fair value less costs to sell or the value in use is higher than the carrying amount, the Company need not estimate the other amount. Impairment is determined by assessing the recoverable amount of each CGU (or group of CGUs) to which the goodwill relates. For the purposes of assessing

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impairment, assets are grouped at the lowest level for which there is separately identifiable cash flow (CGU level). Impairment losses relating to goodwill cannot be reversed in future periods.

As part of the impairment testing procedures, the goodwill is allocated to a CGU that is the lowest level at which goodwill is monitored. If the recoverable amount of the asset (or CGU) is lower than its carrying amount, the carrying amount of the asset (or CGU) is reduced to its recoverable amount. The difference between the carrying amount and recoverable amount is recognized as an impairment loss in the income statement.

Critical accounting estimates and judgments - Impairment of goodwill

The process of estimating the recoverable amount involves the use of assumptions, judgment and projections for future cash flows. Management's assumptions and estimates of future cash flow used for the Company's impairment testing of goodwill and non-financial assets are subject to risk and uncertainties, including metal prices and macroeconomic conditions, which are particularly volatile and partially or totally outside the Company's control.

The calculations used for the impairment testing reflect several market assumptions, such as LME prices, consensus models and other available data regarding global base metals demand. The discount factor applied to the discounted cash flow model is the Company's pre-tax weighted average cost of capital ("WACC"), adjusted for country-specific risk factors. These calculations use cash flow projections, before income taxes, based on financial and operational budgets for a five-year period. After the five-year period, the cash flows are extended until the end of the useful life of mine or indefinitely for the smelters. The smelters cash flows do not use growth rates in the cash flow projections of the terminal value.

Rights to use natural resources

Costs for the acquisition of rights to explore and develop mineral properties are capitalized and amortized as a cost of production using the units of production method over their useful lives. Useful lives consider the period of extraction for both mineral reserves and mineral resources, which includes a portion of the Company's inferred resources in the Company's mining operations.

The Company selected the physical unit model to compute amortization expenses under the units of production method. This model consists of amortization being calculated based on actual ore produced during the period compared to the total ore expected to be produced over the life of mine.

Critical accounting estimates and judgments - Quantification of mineral reserves and resources for useful life calculation

The Company classifies measured, indicated and inferred resources based on the definitions of the Canadian Institute of Mining, Metallurgy and Petroleum (or CIM) Definition Standards for Mineral Resources and Mineral Reserves (or the 2014 CIM Definition Standards).

The useful life determination applied to the rights to use natural resources reflect the pattern in which the benefits are expected to be derived by the Company and is based on the estimated life of mine. Any changes to life of mine, based on new information regarding estimates of mineral reserves and mineral resources and mining plan, may affect prospectively the life of mine and amortization rates.

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The estimation process of mineral reserves and mineral resources is based on a technical evaluation, which includes geological, geophysics, engineering, environmental, legal and economic estimates and may have relevant impact on the economic viability of the mineral reserves and mineral resources. These estimates are reviewed periodically, and any changes are reflected in the expected life of mine.

Management is confident based on testing, continuity of the ore bodies and conversion experience that a part of the inferred resources will be converted into measured and indicated resources, and if they are economically recoverable, such inferred resources may also be classified as proven and probable mineral reserves. Where the Company can demonstrate the expected economic recovery with a high level of confidence, inferred resources are included in the calculation of amortization.

However, the future conversion of inferred resources is inherently uncertain and involves judgement and estimates that could have a material impact on the Company's results of operations.

(a) Analysis

	2018			
	Goodwill	Rights to use natural resources	Other	Total
Balance at the beginning of the year				
Cost	673,287	1,672,931	62,084	2,408,302
Accumulated amortization	—	(543,927)	(41,656)	(585,583)
Net balance	673,287	1,129,004	20,428	1,822,719
Disposals	—	(17)	(11)	(28)
Amortization	—	(77,792)	(1,932)	(79,724)
Transfers	—	1,463	2,528	3,991
Foreign exchange (losses) gains	1,513	(3,613)	(2,397)	(4,497)
Balance at the end of the year	674,800	1,049,045	18,616	1,742,461
Cost	674,800	1,669,645	56,853	2,401,298
Accumulated amortization	—	(620,600)	(38,237)	(658,837)
Net balance at the end of the year	674,800	1,049,045	18,616	1,742,461
Average annual amortization rates %	—	6	19	—
	2017			
	Goodwill	Rights to use natural resources	Other	Total
Balance at the beginning of the year				
Cost	675,561	1,673,091	55,115	2,403,767
Accumulated amortization	—	(469,381)	(31,234)	(500,615)
Net balance	675,561	1,203,710	23,881	1,903,152
Acquisitions	—	—	921	921
Disposals	—	—	(36)	(36)
Amortization	—	(74,024)	(993)	(75,017)
Foreign exchange losses	(2,274)	(682)	(674)	(3,630)
Transfers	—	—	(2,671)	(2,671)
Balance at the end of the year	673,287	1,129,004	20,428	1,822,719
Cost	673,287	1,672,931	62,084	2,408,302
Accumulated amortization	—	(543,927)	(41,656)	(585,583)
Net balance at the end of the year	673,287	1,129,004	20,428	1,822,719
Average annual amortization rates %	—	5	20	—

The Company assesses at each reporting period whether there is objective evidence that any item of intangible asset is impaired. No impairment was identified at December 31, 2018.

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(b) Goodwill on acquisitions

The goodwill is allocated to a CGU or a group of CGUs based on the expected benefits from the synergies of the acquisition. A CGU or a group of CGUs represent the lowest level within the Company at which goodwill is monitored.

	Goodwill	Other net assets carrying amount	Total carrying amount
Group of CGUs - Mining Peru	582,306	1,099,557	1,681,863
CGU - Smelter Peru	92,494	774,040	866,534
	674,800	1,873,597	2,548,397

(c) Key assumptions used in goodwill impairment testing

The Company performed the annual goodwill impairment testing for the Mining Peru and Smelter Peru at September 30, 2018. The recoverable amount was estimated using the value in use method and exceeded the carrying value. Therefore, no impairment was recognized in the consolidated financial statements.

The Company identified metal prices, WACC and life of mine ("LOM") as key assumptions for the recoverable amount determination, due to the material impact of such assumptions on the discounted cash flow determination. These assumptions are summarized below:

	Key assumptions
Zinc (US\$/t)	2,517
Copper (US\$/t)	6,478
Discount rate	
Pre-tax discount rate (Brazil)	11.98%
Pre-tax discount rate (Peru)	10.34%
	LOM(Years)
Brownfield mines	from 9 to 21
Greenfield projects	from 12 to 24

The Company performed a stress test on the key assumptions used for cash flow determination. If the LME zinc price assumption for the value in use calculation had been 20% lower than management's estimates at September 30, 2018 (US\$/t 2,014), the Company would have had to recognize an impairment against the carrying amount of this CGU of approximately USD 180,534. Also, under the reasonable stress test scenarios performed by the Company, an increase of 20% in the WACC would not result in an impairment loss.

15 Loans and financings
Accounting policy

Loans and financings are recognized initially at fair value, net of transaction costs incurred, and are subsequently measured at amortized cost. Any difference between the proceeds (net of transaction costs) and the total amount payable is recognized in the income statement as interest expense over the period of the loans using the effective interest rate method.

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Loans and financings are classified as current liabilities unless the Company has the unconditional right to defer repayment of the liability for at least 12 months after the reporting period.

Fees paid on the establishment of loan facilities are recognized as transaction costs of the loan to the extent that it is probable that some or all of the facility will be drawn down. In this case, the fee is deferred until the drawdown occurs. To the extent that there is no evidence that it is probable that some or all of the facility will be drawn down, the fee is capitalized as a prepayment for liquidity services and amortized over the period of the facility to which it relates.

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Composition and maturity profile

Type	Average annual charges	Current		Non-current		Total		Fair value	
		2018	2017	2018	2017	2018	2017	2018	2017
Eurobonds - USD	Fixed 5.13%	9,907	8,778	1,032,664	1,032,664	1,042,571	1,041,442	1,014,974	1,120,901
Debt with banks	Libor + 1.27%	773	435	196,519	199,179	197,292	199,614	206,349	214,293
BNDES	TJLP + 2.82% / SELIC + 3.10% / TLP + 5.23%	6,117	19,795	83,808	73,653	89,925	93,448	82,208	85,969
Debentures	110.5% CDI	7,432	8,885	20,756	32,403	28,188	41,288	28,269	41,405
Export credit note	—	1,102	—	61,622	—	62,724	—	—	64,058
Other	8,284	1,846	58,607	6,937	66,891	8,783	69,778	8,506	
	32,513	40,841	1,392,354	1,406,458	1,424,867	1,447,299	1,401,578	1,535,132	
Current portion of long term loans and financing (principal)		21,107	28,019						
Interest on loans and financing		11,406	12,822						
	32,513	40,841							

- BNDES - Brazilian National Bank for Economic and Social Development
TJLP - Long-term interest rate set by the Brazilian National Monetary Council
SELIC - Brazilian basic interest rate
CDI - Brazilian Interbank Deposit Certificate
TLP - Set by the Brazilian National Monetary Council and composed by Brazil's expected inflation plus spread

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The maturity profile of loans and financing at December 31, 2018, was as follows:

	Total								As from 2026	Total
	2019	2020	2021	2022	2023	2024	2025	2026		
Eurobonds - USD	9,907	—	—	—	339,601	—	—	—	693,063	1,042,571
Debt with banks	773	—	78,607	78,607	39,305	—	—	—	—	197,292
BNDES	6,117	6,763	8,112	12,156	12,156	11,912	11,176	21,533	89,925	—
Debentures	7,432	6,909	6,924	6,923	—	—	—	—	—	28,188
Other	8,284	10,271	10,273	8,820	7,796	7,737	7,736	5,974	66,891	—
	<u>32,513</u>	<u>23,943</u>	<u>103,916</u>	<u>106,506</u>	<u>398,858</u>	<u>19,649</u>	<u>18,912</u>	<u>720,570</u>	<u>1,424,867</u>	<u>1,424,867</u>
	<u>3%</u>	<u>2%</u>	<u>7%</u>	<u>7%</u>	<u>28%</u>	<u>1%</u>	<u>1%</u>	<u>51%</u>	<u>100%</u>	

(a) Changes

	2018	2017
Balance at the beginning of the year	1,447,299	1,144,385
Payments	(295,104)	(537,254)
New loans and financing	292,901	830,598
Foreign exchange gain	(5,777)	(2,873)
Gain on debt modification	(3,428)	—
Interest accrual	61,385	69,481
Interest paid	(72,409)	(57,038)
Balance at the end of the year	<u>1,424,867</u>	<u>1,447,299</u>

(b) Analysis by currency

	Current		Non-current		Total	
	2018	2017	2018	2017	2018	2017
US Dollar	17,267	13,260	1,284,128	1,272,223	1,301,395	1,285,483
Brazilian Real	15,246	27,471	108,226	134,235	123,472	161,706
Other	—	110	—	—	—	110
	<u>32,513</u>	<u>40,841</u>	<u>1,392,354</u>	<u>1,406,458</u>	<u>1,424,867</u>	<u>1,447,299</u>

(c) Analysis by index

	Current		Non-current		Total	
	2018	2017	2018	2017	2018	2017
Fixed rate	9,884	11,192	1,037,361	1,038,459	1,047,245	1,049,651
LIBOR	7,719	610	247,614	230,573	255,333	231,183
TJLP	1,467	12,509	14,700	35,341	16,167	47,850
UMBNDES	—	3,211	—	5,496	—	8,707
CDI	7,430	9,811	20,758	62,632	28,188	72,443
TLP	5,881	—	52,606	—	58,487	—
BNDES Selic	132	3,508	19,315	33,957	19,447	37,465
	<u>32,513</u>	<u>40,841</u>	<u>1,392,354</u>	<u>1,406,458</u>	<u>1,424,867</u>	<u>1,447,299</u>

(d) Guarantees and covenants

At December 31, 2018, NEXA is the guarantor of NEXA BR's loans with BNDES in the amount of USD 89,925.

At December 31, 2018, NEXA BR provided collateral guarantee in the form of machinery and equipment on part of its loans in the amount of USD 1,183.

The Company has borrowings that are subject to financial covenants at the consolidated level, such as: (i) the gearing ratio (net debt/adjusted EBITDA); (ii) the capitalization ratio (total debt/total debt + shareholders' equity or shareholders' equity/total assets); and (iii) interest coverage ratio (cash + adjusted EBITDA/interest + short-term debt). When applicable, these compliance obligations are standardized for all borrowing agreements. At December 31, 2018, the Company was in compliance with all applicable covenants.

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(e) Bonds

On May 4, 2017, NEXA issued an aggregate principal amount of USD 700,000 in unsecured bonds set to mature in 2027 at an interest rate of 5.375% per year. The proceeds from this offering were used to repay a portion of existing consolidated debt with banks, thereby extending the maturity of outstanding debt. These securities are guaranteed by NEXA BR, NEXA PERU and NEXA CJM.

On March 28, 2013, NEXA PERU conducted a bond offering in the international market for USD 350,000, at an annual fixed interest rate of 4.625% to be paid semi-annually. These financial instruments have a term of ten years and will be redeemed on March 28, 2023.

(f) Repayment of debt

On May 25, 2018, the Company prepaid a term loan with principal amount of USD 100,000, maturity of November 2021 and cost of three-month Libor plus 2.55% p.a. The amount paid was USD 101,083, corresponding to the principal plus accrued and unpaid interest.

On March 9, 2018, the Company repaid certain Export Credit Notes with principal amount of USD 31,393, maturity of April 2020 and cost of three-month LIBOR + 1.85% p.a. The accompanying foreign exchange and interest rate swaps intended to change the interest index and currency of debt service repayments of this note was also liquidated in advance, generating a gain of USD 91 recognized in Net financial results.

On March 9, 2018, the Company repaid in full its Export Credit Notes with principal amount of USD 30,807, maturity of April 2020 and a cost of 118% of the CDI rate. The amount paid was USD 30,891 and includes principal plus accrued and unpaid interest.

(g) Renegotiation of debt

On May 22, 2018, the Company renegotiated a term loan with principal amount of USD 100,000, maturity of November 2021 and cost of six-month Libor plus 2.50% p.a. The renegotiated debt with the same counter-party has a maturity of May 2023 and a cost of six-month Libor plus 1.27% p.a. This transaction was accounted for as debt modification due to non-substantial modifications made to the original debt and a gain of USD 3,428 was recognized in Net financial results. This loan is guaranteed by NEXA CJM and NEXA BR.

On December 27, 2018, the NEXA BR renegotiated contractual terms with BNDES comprising loans of a total principal amount of USD 58,990 (equivalent to BRL 228,573), original maturity dates from 2019 until 2023 and subjected to interest rates of TJLP plus spread (between 2.36% and 2.48% p.a.) or SELIC plus spread (between 2.48% to 2.72% p.a.). The renegotiated debts with the same counter-party have the final maturity in December 2028 and are subjected to a cost of TLP plus spread (between 2.09% to 2.29% p.a.) and replaces the guarantor from VSA to NEXA. This transaction was accounted for as a debt extinguishment due to the substantial modifications made to the original debt and no gain or loss was recognized in the income statement.

On January 2019, NEXA BR contracted a swap to change the Brazilian inflation component of the TLP rate to 53.04% of the CDI rate.

(h) New loans

On May 22, 2018, the Company entered into a term loan agreement in the principal amount of USD 100,000, maturing in May 2023 and with a cost of six-month Libor plus 1.27% p.a. Proceeds from this transaction were used to prepay a term loan with interest rate of three-month Libor plus

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2.55% p.a. No gain or loss were recognized on the early payment of the debt. This loan is guaranteed by NEXA CJM and NEXA BR.

On June 27, 2018, the Company utilized the amount of USD 62,500 of a new facility agreement to finance the purchase of machinery and equipment. The facility matures in 2027 and has an effective interest rate of 5.29% p.a.

16 Confirming payables

The Company entered into agreements extending payment terms from 90 to 180 days with a number of suppliers. These suppliers have the option to discount their receivables with banks. At December 31, 2018, accounts payable amounting to USD 70,411 (2017: USD 111,024) were included in such agreements.

17 Salaries and payroll charges

	2018	2017
Direct remuneration and payroll charges	17,404	21,357
Provision for profit sharing and other payable	40,762	58,441
	58,166	79,798

18 Current and deferred income taxes**Accounting policy**

The current and deferred taxes on income are calculated on the basis of the tax laws enacted or substantively enacted up to balance sheet date in the countries where the entities operate and generate taxable income. Management periodically evaluates positions taken by the Company in the taxes on income returns with respect to situations in which the applicable tax regulations are subject to interpretation. It establishes provisions where appropriate on the basis of amounts expected to be paid to the tax authorities.

The current income tax is presented net, separated by taxpaying entity, in liabilities when there are amounts payable, or in assets when the amounts prepaid exceed the total amount due on the reporting date.

Deferred tax assets are recognized only to the extent it is probable that future taxable income will be available against which the temporary differences and/or tax losses can be utilized.

Deferred tax assets and liabilities are offset when there is a legally enforceable right and an intention to offset them in the calculation of current taxes, generally when they are related to the same legal entity and the same tax authority. Accordingly, deferred tax assets and liabilities in different entities or in different countries are generally presented separately, and not on a net basis.

Deferred tax liabilities and assets are not recognized for temporary differences between the carrying amounts and tax bases of investments in foreign operations where the Company is able to control the timing of the reversal of the temporary differences and it is probable that the differences will not be reversed in the near future.

Deferred income tax are provided in full, using the liability method, on temporary differences arising between the tax bases of assets and liabilities and their carrying amounts in the consolidated financial statements. However, deferred tax liabilities are not recognized if they arise

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from the initial recognition of goodwill. Deferred income tax is also not accounted for if it arises from the initial recognition of an asset or liability in a transaction other than a business combination that, at the time of the transaction, affects neither the accounting nor the taxable income or loss. Deferred income tax is determined using tax rates (and laws) that have been enacted or substantially enacted by the end of the reporting period and are expected to apply when the related deferred income taxes asset is realized or the deferred income tax liability is settled.

Critical accounting estimates and judgments

The Company is subject to income tax in all countries in which it operates. Significant judgment is required in determining the income tax provision. There are many transactions and calculations for which the ultimate tax determination is uncertain. The Company also recognizes liabilities for anticipated tax audit issues based on estimates of whether additional taxes will be due. Where the final tax outcome of these matters is different from the amounts that were initially recorded, such differences will impact the current and deferred tax assets and liabilities in the period in which such determination is made.

(a) Reconciliation of income taxes expenses

	2018	2017	2016
Income before income tax	131,898	271,459	208,892
Standard rate (i)	26.01%	27.08%	29.22%
Income tax	(34,307)	(73,511)	(61,038)
Difference in tax rate for subsidiaries outside Luxembourg	(11,227)	(19,912)	(11,425)
Re-measurement of deferred tax - change in Peru tax rate (ii)	—	—	(41,588)
Taxes on dividend received from foreign subsidiary	—	(8,299)	—
Special mining levy and special mining tax	(14,565)	(22,766)	(10,953)
Other permanent differences	19,176	18,294	26,621
Income tax	(40,923)	(106,194)	(98,383)
Current	(71,787)	(125,691)	(75,282)
Deferred	30,864	19,497	(23,101)
Taxes on income on the income statement	(40,923)	(106,194)	(98,383)

- (i) The combined applicable income tax rate was 29.22% for the fiscal year ending 2016. On December 14, 2016, the Luxembourg government approved Law 7020, that decreased the income tax rate to 27.08% in 2017 and to 26.01% from 2018 onwards.
- (ii) The Peruvian companies pay their taxes based on the general regime of taxation, which provides for a progressive decrease in the tax rate after the year 2015. In 2016 the rate was 28% while for 2017 and 2018 the rate was expected to be 27% and from 2019 onwards the rate was expected to be 26%. However, in December 2016, the tax rate changed to 29.5% applicable from January 1, 2017.

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Analysis of deferred tax balances

	2018	2017
Tax credits on non-operating losses (i)	106,817	104,100
Tax credits on temporary differences		
Foreign exchange losses	50,766	79,430
Environmental liabilities	28,808	28,504
Asset retirement obligation	19,879	23,990
Tax, civil and labor provisions	9,389	15,666
Other provisions	6,443	12,481
Provision for profit sharing	5,409	6,521
Provision for inventory losses	5,308	4,395
Other	12,094	10,231
Tax debits on temporary differences		
Capitalized interest	(11,725)	(10,624)
Accelerated depreciation and adjustment of useful lives	(10,636)	(28,371)
Depreciation and amortization of fair value adjustment to PP&E and intangible assets	(318,198)	(344,531)
Other	(1,798)	(2,210)
	(97,444)	(100,418)
Net deferred tax assets related to the same legal entity	201,154	224,513
Net deferred tax liabilities related to the same legal entity	(298,598)	(324,931)
	(97,444)	(100,418)

(i) Tax credits on non-operating losses can be used to offset future tax payments. These credits do not expire if not used by the Company. The breakdown by country is as follows:

	2018	2017
Brazil	104,195	103,791
Peru	2,622	309
	106,817	104,100

The Company had unutilised tax losses resulting from its holding activities in Luxembourg in the amount of USD 57,800 in 2018 (USD 54,328 in 2017). These tax losses do not expire if not used by the Company. Given uncertainty in the future profitability, no deferred tax assets were recognised in respect of these losses.

(b) Effects of deferred tax on income statement and other comprehensive income

	2018	2017
Balance at the beginning of the year	(100,418)	(107,304)
Effect on income for the year	30,864	19,497
Effect on other comprehensive income	(126)	(4,119)
Foreign exchange translation effect	(27,764)	(8,492)
Balance at the end of the year	(97,444)	(100,418)

19 Provisions

Accounting policy

Provisions for tax, civil, labor, environmental and legal claims and judicial deposits

Provisions for legal claims (labor, civil, tax and environmental) are recognized when: (i) the Company has a present legal or constructive obligation as a result of past events; (ii) it is probable that an outflow of resources will be required to settle the obligation; and (iii) the amount can be reliably estimated. The provisions are periodically estimated and the likelihood of losses is supported by the Company's legal counsel.

Provisions are measured at the present value of the expenditure expected to be required to settle the obligation using a discount rate that reflects current market assessments of the time value of

Nexa Resources S.A.

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money and the risks specific to the obligation. The increase in the provision due to the passage of time is recognized as “Financial expenses”.

When a claim is secured by a judicial deposit, the Company offsets the provision with the judicial deposit amount in the consolidated balance sheet. However, the Company also has judicial deposits for claims for which the likelihood of loss is possible or remote and for which no provision is recognized. In such cases, these amounts are recognized as outstanding judicial deposits in the Company’s assets.

The Company splits the provisions by nature at the balance sheet due to the specifics underlying risks and assessment requirements for each claim.

Critical accounting estimates - Tax, civil, labor and environmental provisions

The Company is part of ongoing labor, civil, tax and environmental lawsuits which are pending at different court levels. The provisions for potentially unfavorable outcomes of litigation in progress are established and updated based on management evaluation, as supported by the positions of external legal counsel, and require a high level of judgment regarding the matters involved.

Asset retirement obligation

Provision is made for asset retirement obligation, restoration and environmental costs when the liability arises due to the development or mineral production of an operating asset, based on the net present value of estimated closure costs. Management uses its judgment and previous experience to determine the potential scope of rehabilitation work required and the related costs associated with that work.

The cash flows are discounted to present value using a credit risk-adjusted rate that reflects current market assessments of the time value of the money and the specifics risks for the asset to be restored. The interest rate charges relating to the liability are recognized as an accretion expense in net financial results. Difference in the settlement amount of the liability are recognized in the income statement.

Critical accounting estimates and judgments - Asset retirement obligations

The initial recognition and the subsequent revisions of the asset retirement obligation considers critical future closure costs estimates and several assumptions such as interest rates, inflation and useful lives of the assets. These estimates are reviewed quarterly by the Company.

Cost estimates can vary in response to many factors of each site that include timing, expected life of mine, changes to the relevant legal or government requirements and commitments with stakeholders, review of remediation and relinquishment options, emergence of new restoration techniques, among others. External experts support the cost estimation process where appropriate. These factors either isolated or consolidated could significantly affect the future financial results and balance the sheet position. At December 31, 2018, the credit risk-adjusted rate used for Peru was between 3.4% to 9.5% (2017: 1.5% to 2.4%) and for Brazil was between 3% to 5.4% (2017: 7.8%).

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(a) Analysis

	Asset Retirement Obligation	Environmental Obligation	2018				2017	
			Judicial provision				Total	Total
			Tax	Labor	Civil	Environmental		
Balance at the beginning of the year	199,445	83,835	18,575	16,421	18,320	4,565	341,161	296,879
Additions	—	—	2,958	11,811	4,173	2,960	21,902	47,816
Reversals	(15,119)	—	(8,753)	(15,012)	(20,908)	(2,320)	(62,112)	(42,019)
Interest	8,443	5,049	794	1,387	105	213	15,991	13,476
Write-off	462	(5,140)	—	—	—	—	(4,678)	(18,666)
Foreign exchange variation (losses) gains	(15,133)	(12,263)	(1,707)	(2,188)	(215)	(404)	(31,910)	(2,367)
Cost and interest revision	7,454	13,249	—	—	—	—	20,703	43,789
Other	—	—	201	(231)	(104)	—	(134)	2,253
Balance at the end of the year	185,552	84,730	12,068	12,188	1,371	5,014	300,923	341,161
Current	—	20,357	—	—	—	—	20,357	14,641
Non-current	185,552	64,373	12,068	12,188	1,371	5,014	280,566	326,520
	185,552	84,730	12,068	12,188	1,371	5,014	300,923	341,161

(b) Breakdown of tax, civil, labor and environmental provisions

The provisions and the corresponding judicial deposits are as follow:

	2018				2017			
	Judicial deposits	Provision	Net amount	Outstanding judicial deposits	Judicial deposits	Provision	Net amount	Outstanding judicial deposits
Tax	(2,048)	14,116	12,068	2,245	(2,318)	20,893	18,575	3,130
Labor	(4,258)	16,446	12,188	6,555	(4,765)	21,186	16,421	7,408
Civil	(746)	2,117	1,371	17	(758)	19,078	18,320	23
Environmental	—	5,014	5,014	413	—	4,565	4,565	388
	(7,052)	37,693	30,641	9,230	(7,841)	65,722	57,881	10,949

(i) Comments on tax provisions

Tax provisions relate to tax proceedings, with a probable likelihood of loss relating to federal, state and municipal taxes.

(ii) Comments on civil provisions

Civil provisions relate to indemnification actions mainly related to claims seeking loss of profits, compensatory, and incidental damages. There are also claims regarding real estate and property matters, such as possessory lawsuits.

(iii) Comments on labor lawsuits provisions

Labor lawsuits provisions relate to labor lawsuits filed by former employees, third parties and labor unions mostly claiming the payment of indemnities on dismissals, health hazard premiums and hazardous duty premiums, overtime, and commuting hours, as well as alleged occupational illnesses, work accidents, property and personal damage.

(iv) Comments on environmental provisions

The Company has established policies and procedures to comply with environmental laws and on a regular basis performs analyses to identify environmental legal risks to ensure that the prevention and detection systems are in place to adequately manage these risks. Environmental litigation consists basically of civil public actions to interrupt the environmental licensing for the Company's mines and smelters and indemnity actions for alleged environmental impacts arising from the Company's activities.

Nexa Resources S.A.

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(c) Summary of contingent liabilities

The Company is part of other litigation involving a risk of possible loss, for which no provision is recognized, as detailed below:

	2018	2017
Tax	137,170	125,438
Labor	29,079	46,402
Civil	20,130	24,911
Environmental	119,747	133,851
	306,126	330,602

(i) Comments on contingent tax liabilities

The main contingent liabilities relating to tax lawsuits are discussed below.

Compensation for exploration for mineral resources

It relates to assessments issued by the Brazilian National Department of Mineral Production for alleged failure to pay or underpayment of Financial Compensation for the Exploration of Mineral Resources ("CFEM"). The estimate of financial effect of this contingent liability is USD 6,947.

Indirect taxes on sales

It relates to assessments issued by the Brazilian Internal Revenue Service concerning certain credits taken by the Company when calculating those indirect taxes on sales. The estimate of financial effect of this contingent liability is USD 4,788.

Brazilian corporate income taxes

It relates to assessments issued by the Brazilian Internal Revenue Service concerning the following:

- Carryforward calculation of net operating losses for Brazilian corporate income taxes determination. The estimate of financial effect of this contingent liability is USD 5,189.
- Deductibility of certain foreign exchange losses for Brazilian corporate income taxes determination. The estimate of financial effect of this contingent liability is USD 10,177.

Value-added tax on sales

It relates to assessments issued by the tax authorities of the State of Minas Gerais concerning the following:

- Incidence of value-added tax on sales of certain energy contracts. The estimate of financial effect of this contingent liability is USD 32,849.
- The tax rate applied to interstate sales for manufactured goods with imported content. The estimate of financial effect of this contingent liability is USD 4,058.
- The Company was challenged by the tax authorities regarding certain credits to the purchases of property, plant and equipment. The estimate of financial effect of this contingent liability is USD 8,662.

Nexa Resources S.A.**Notes to the consolidated financial statements
at December 31, 2018
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Include several claims filed by former employees, third parties and labor unions, mostly claiming the payment of indemnities on dismissals, health hazard premiums and hazardous duty premiums, overtime and commuting hours, as well as indemnity claims by former employees and third parties based on alleged occupational illnesses and work accidents. The individual amount of the claims are not material.

(iii) Comments on contingent civil liabilities

The main contingent civil liability is related to indemnity lawsuits alleging property damage, pain and suffering. The estimate of financial effect of this contingent liability is USD 10,341.

(iv) Comments on contingent environmental liabilities

The main contingent environmental liabilities were filed by fishermen communities against the Company for indemnification, compensation for material and moral damages due to alleged pollution of the São Francisco River. The estimate of financial effect of these contingent liabilities is USD 96,946.

20 Contractual liabilities

In 2016, the Company entered into a silver streaming arrangement, which consisted of an upfront payment of USD 250,000 for the anticipated sale of a portion of the silver contained in the ore concentrates produced by the Cerro Lindo mining unit. The prepaid amount was recognized as a contractual liability and the corresponding revenue is recognized as the silver is delivered, which is the time that the contractual performance obligations are satisfied. The changes in the contractual liabilities are shown below:

	2018	2017
At January	221,885	250,000
Revenue recognition upon ore delivery	(29,543)	(36,299)
Accretion for year	7,295	8,184
At December	<u>199,637</u>	<u>221,885</u>
Current	31,992	31,296
Non-current	167,645	190,589
	<u>199,637</u>	<u>221,885</u>

21 Shareholders' equity**Accounting policy**

Common shares are classified in shareholders' equity. Each time a share premium is paid to the Company for an issued share, the respective share premium is allocated to the share premium account. Each time the repayment of a share premium is decided, such repayment shall be done pro-rata to the existing shareholders.

The distribution of dividends to the Company's shareholders is recognized as a liability in the Company's consolidated financial statements in the period in which the dividends are approved by the Company's shareholders.

Shares repurchased under the Company's buyback program and that are not cancelled, are reported as treasury shares and are deducted from shareholders' equity. These shares are also

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deducted in earnings per share calculation.

(a) Capital

As of December 31, 2018, the outstanding capital of USD 133,320 (2017: 133,320) is comprised of 133,320 thousand subscribed and issued common shares (2017: 133,320 thousand), with par value of US\$ 1.00 per share. In addition to the subscribed and issued common shares, NEXA also has an authorized, but unissued and unsubscribed share capital set at USD 231,925.

(b) Treasury shares

On September 20, 2018, the Company's Board of Directors approved a share buyback program to repurchase up to USD 30,000 of its outstanding common shares, over the 12-month period beginning on November 6, 2018 and ending on November 6, 2019. The repurchased shares will not be cancelled but held in treasury at this time. As of December 31, 2018, the Company had repurchased USD 1,352, corresponding to 112 thousand shares.

(c) Share premium

The share premium, if any, may be distributed to the shareholders in accordance with Luxembourg Commercial Companies Act by a resolution of the Board of Directors.

On February 15, 2018, the Board of Directors approved a distribution to the shareholders in the form of a reimbursement of share premium of USD 0.60 cents per common share to shareholders on record at the close of business on March 14, 2018 and paid USD 80,000 to its shareholders on March 28, 2018.

(d) Additional paid in capital

Additional paid in capital arises from transactions recognized in equity that do not qualify as capital or share premium in accordance with Luxembourg Commercial Companies Act and, therefore, cannot be distributed to the shareholders of the Company.

(e) Accumulated other comprehensive income (loss)

The changes in the accumulated other comprehensive income (loss) are as follows:

	Cumulative translation adjustment	Remeasurements of retirement benefits	Hedge accounting	Total
At January 1, 2016	<u>(119,460)</u>	<u>3,327</u>	<u>6,276</u>	<u>(109,857)</u>
Translation adjustment on foreign investments	30,373	—	—	30,373
Cash flow hedge accounting	—	—	(16,256)	(16,256)
At December 31, 2016	<u>(89,087)</u>	<u>3,327</u>	<u>(9,980)</u>	<u>(95,740)</u>
Translation adjustment on foreign investments	(10,742)	—	—	(10,742)
Cash flow hedge accounting	—	—	12,556	12,556
Remeasurements of retirement benefits	—	(3,327)	—	(3,327)
At December 31, 2017	<u>(99,829)</u>	<u>—</u>	<u>2,576</u>	<u>(97,253)</u>
Translation adjustment on foreign investments	(9,959)	—	—	(9,959)
Cash flow hedge accounting	—	—	(2,192)	(2,192)
At December 31, 2018	<u>(109,788)</u>	<u>—</u>	<u>384</u>	<u>(109,404)</u>
Attributable to non-controlling interests				(30,116)
Attributable to NEXA's shareholders				(79,288)

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(f) Earnings per share

Basic earnings per share are computed by dividing the net income attributable to the NEXA's shareholders by the average number of outstanding shares for the year. Diluted earnings per share is computed in a similar way, but with the adjustment in the denominator when assuming the conversion of all shares that may be dilutive. The Company does not have any dilutive shares and consequently the Basic and diluted earnings per share are the same.

	2018	2017	2016
Net income for the year attributable to NEXA's shareholders	74,860	126,885	93,167
Weighted average number of outstanding common shares (thousands)	133,313	116,527	80,699
Earnings per share in US Dollars	0.56	1.09	1.15

(g) Non-controlling interests

Summarized balance sheet

	NEXA PERU	Polarix	
	2018	2017	
Current assets	957,821	854,295	10,280
Current liabilities	248,938	236,558	3,459
Current net assets	708,883	617,737	6,821
Non-current assets	642,007	634,757	91,702
Non-current liabilities	581,172	624,856	21,478
Non-current net assets	60,835	9,901	70,224
Net assets	769,718	627,638	77,045
Accumulated non-controlling interests	373,838	361,265	51,363
			60,716

Summarized income statement

	NEXA PERU	Polarix	
	2018	2017	
Net revenues	827,537	911,745	11,916
Net income for the year	142,082	224,480	3,742
Other comprehensive income (loss)	—	8,538	(15,322)
Total comprehensive income (loss) for the year	142,082	233,018	(11,580)
Comprehensive income (loss) attributable to non-controlling interests	13,621	30,207	(7,724)
Dividends paid to non-controlling interests	—	55,073	2,137
			—

Summarized statement of cash flows

	NEXA PERU	Polarix	
	2018	2017	
Net cash provided by operating activities	232,391	131,304	7,201
Net cash used in investing activities	(76,695)	(19,371)	(762)
Net cash used in financing activities	—	(335,297)	(6,441)
Increase (decrease) in cash and cash equivalents	155,696	(223,364)	(2)
			2

22 Net revenues

Accounting policy

Revenue represents the fair value of the consideration received or receivable for the sale of goods in the ordinary course of the Company's activities. Revenues are shown net of value-added tax, returns, rebates and discounts, after eliminating sales between the consolidated companies.

Nexa Resources S.A.
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The Company recognizes revenue when a performance obligation is satisfied by transferring a promised good or service to a customer. The asset is transferred when the customer obtains control of that asset. To determine the point in time at which a customer obtains control of a promised asset the Company considers the following indicators: (i) the entity has a present right to payment for the asset; (ii) the customer has legal title to the asset; (iii) the entity transferred physical possession of the asset; (iv) the customer has the significant risks and rewards of ownership of the asset; (v) the customer has accepted the asset.

Identification of performance obligations and timing of satisfaction of performance obligations

The Company has two distinct performance obligations included in certain sales contracts, being: (i) the promise to provide goods to its customers, and (ii) the promise to provide freight services to its customers.

Promise to provide goods: this performance obligation is satisfied when the control of such goods is transferred to the final customer, which is substantially determined based on the Incoterms agreed upon in each of the contracts with customers.

Promise to provide freight service: this performance obligation is satisfied when the freight service contracted to customers is completed.

As a result of the distinct performance obligations identified part of the Company's revenue is presented as revenue from services. Cost related to revenue from services is presented as "Cost of sales".

Determining the transaction price and the amounts allocated to performance obligations

The Company has considered the terms of the contract and its customary business practices to determine the transaction price. The transaction price is the amount of consideration to which the Company expects to be entitled in exchange for transferring promised goods or services to its customers. Transaction price is allocated to each performance obligation on a relative standalone selling price basis.

For the purpose of determining the transaction price, the entity has mainly fixed prices. However, the Company's silver streaming arrangement for Cerro Lindo mine has the transaction price linked to silver production, which might change over time. Therefore, it is accounted for as variable consideration. The impact on recognition of revenue related to these sales was not material for December 31, 2018.

(a) Composition of net revenues

	2018	(Revised) 2017	(Revised) 2016
Gross revenues	2,779,008	2,709,236	2,193,867
Revenues of products	2,708,112	2,637,613	2,128,739
Revenues of services	70,896	71,623	65,128
Taxes on sales	(284,316)	(257,347)	(227,344)
Return on products sales	(3,490)	(2,405)	(1,682)
Net revenues	<u>2,491,202</u>	<u>2,449,484</u>	<u>1,964,841</u>

(b) Information on geographical areas in which the Company operates

The geographical areas are determined based on the location of the Company's customers. The net revenues of the Company, classified by currency and destination, is as follows:

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(i) Revenues by destination

	2018	(Revised) 2017	(Revised) 2016
Brazil	693,409	721,640	560,878
Peru	674,228	696,527	573,884
Luxembourg	172,791	130,723	100,631
United States of America	141,131	158,060	156,634
Switzerland	126,156	108,798	59,873
Japan	93,474	69,565	36,005
Argentina	90,338	79,463	45,050
South Korea	54,894	7,064	66,887
Colombia	51,724	47,734	39,137
Chile	51,215	38,101	67,546
Turkey	48,265	35,522	19,498
Austria	40,531	37,270	22,982
Singapore	37,506	60,857	42,666
Germany	20,906	23,154	42,560
China	9,538	18,172	12,838
Italy	5,327	15,799	3,608
Others	179,769	201,035	114,164
	2,491,202	2,449,484	1,964,841

(ii) Revenues by currency

	2018	(Revised) 2017	(Revised) 2016
US Dollar	1,806,590	1,729,234	1,414,992
Brazilian Real	684,612	717,032	547,537
Other	—	3,218	2,312
	2,491,202	2,449,484	1,964,841

23 Expenses by nature

	2018			(Revised) 2017	(Revised) 2016	
	Cost of sales	Selling, general and administrative	Mineral exploration and project development	Total	Total	Total
Raw materials and consumables used	1,114,959	838	—	1,115,797	1,120,540	956,909
Employee benefit expenses (i)	159,329	91,000	12,635	262,964	279,371	234,205
Depreciation and amortization	262,948	4,219	22	267,189	270,456	275,036
Services, miscellaneous	231,501	34,211	83,379	349,091	220,535	122,557
Other expenses	120,207	29,335	30,242	179,784	109,115	106,446
	1,888,944	159,603	126,278	2,174,825	2,000,017	1,695,153

- (i) A provision is recorded to recognize the expenses related to employee profit sharing. This provision is calculated based on the qualitative and quantitative targets established by management.

For the year ended December 31, 2018, the average number of employees was 6,159 (2017: 5,643; 2016: 5,561).

24 Mineral exploration and project development

	2018	2017	2016
Mineral exploration (i)	83,182	76,161	33,547
Project development (FEL 1 and FEL 2) (ii)	43,096	16,537	13,164
	126,278	92,698	46,711

- (i) Increase in mineral exploration is due to the Company's activities to increase reserves and resources and also to develop its greenfield portfolio. Amounts are divided between brownfield (USD 41,502) and greenfield (USD 41,860) exploration.
- (ii) The increase is due to the development of projects in FEL1 and FEL2 stages, of which USD 16,960 related to greenfield projects.

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25 Other income and expenses, net

	2018	2017	2016
Corporate projects	(13,445)	(12,947)	(7,675)
Mining obligations	(12,637)	(11,498)	(8,967)
Loss on sale of property, plant and equipment (i)	(9,884)	(694)	(552)
Provision for tax, labor, civil and environmental claims	(3,671)	258	(15,331)
Impairment of property, plant and equipment - Note 13	(3,283)	—	979
Gain on sale of investment	348	4,588	408
Environmental and asset retirement obligations (i)	12,078	433	(68,605)
Commodities derivative financial instruments	17,528	(18,785)	(33,514)
Tax credits (ii)	37,582	57	—
Other operating expenses, net	(6,440)	(9,299)	(6,462)
	18,176	(47,887)	(139,719)

- (i) On May 21, 2018, the Company entered into an agreement to sell assets and to transfer certain liabilities of Fortaleza de Minas facility for USD 27 (BRL 100). The transaction resulted in a gain of USD 3,394, comprised of a loss of USD 9,615 on the sale of property, plant and equipment and intangible assets and a gain of USD 13,009 related to the reversal of the related asset retirement obligation.
- (ii) On October 2018, a final decision by the Regional Federal Court (TRF) granted NEXA BR the right to recover federal tax credits in the amount of USD 59,686, being USD 33,653 principal amount and recognized at “Other income and expenses, net” and USD 26,033 corresponding to interest and recognized as “Financial income”. The credits recognized will be used to reduce future federal tax payments.

26 Net financial results

	2018	2017	2016
Financial income			
Gains on financial investments	26,062	21,388	12,032
Interest on tax credits - Note 25	26,033	—	—
Other financial income	15,414	8,480	12,923
	67,509	29,868	24,955
Financial expenses			
Interest on loans and financing	(77,647)	(56,434)	(36,059)
Interest on contractual liabilities	(7,294)	(8,184)	—
Monetary adjustment of provisions	(4,763)	(9,478)	(9,595)
Derivative financial instruments - Note 6 (iii)	(2,538)	—	—
Other financial expenses	(29,420)	(32,073)	(24,720)
	(121,662)	(106,169)	(70,374)
Foreign exchange losses, net (i)	(148,501)	(53,880)	124,500
Net financial results	(202,654)	(130,181)	79,081

- (i) Foreign exchange losses, net is mainly related to the gain or loss effect of intercompany transactions denominated in a currency other than the functional currency of the parties involved in the transaction, which is not eliminated during the consolidation process, even though the intercompany balances are eliminated.

Consistent with the Company's strategy of reducing its exposure to foreign exchange changes, the subsidiary NEXA BR prepaid in 2018 USD 600,000 of the USD 1,113,400 outstanding debt to NEXA.

27 Long-term commitments

(a) Capital commitments — Aripuanã project

At December 31, 2018, the Company had contracted for USD 15,953 of capital expenditures related to the Aripuanã project that have not yet been incurred for the purchase of property, plant and equipment.

(b) Process inputs materials

The Company has forward purchase commitments in the amount of USD 33,395 for process inputs materials, which are used as part of the Company's operations. This contract contains monthly fixed prices and expires in 2026.

Nexa Resources S.A.

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28 Events after the reporting period

(a) Dividend distribution

On February 15, 2019, the Board of Directors approved, subject to ratification by the Company's shareholders at its upcoming annual meeting, a dividend distribution in the amount of USD 0.525494 cents per common share, equivalent to approximately USD 70,000, to be paid in cash to the Company's shareholders on record at March 14, 2019. The dividends are expected to be paid on March 28, 2019.

(b) Peruvian income tax assessment

On January 2019, the Company was assessed by the Peruvian tax authorities concerning its income tax calculation in the amount USD 37,809. The likelihood of loss is considered possible and no provision was recognized at December 31, 2018.

* * *

Nexa Resources S.A. (formerly VM Holding S.A.)

Société anonyme

26-28 rue Edward Steichen, L-2540 Luxembourg

Grand Duchy of Luxembourg

R.C.S. Luxembourg: B 185.489

RESTATED ARTICLES OF ASSOCIATION AS OF JUNE 28 2018

TITLE I - DENOMINATION, REGISTERED OFFICE, OBJECT, DURATION

1. ARTICLE 1.-

There is hereby established a public limited liability company (“*société anonyme*”) under the name of “**Nexa Resources S.A.**” (the “**Company**”) governed by the present articles of association (the “**Articles**”) and by current Luxembourg laws (“**Luxembourg Law**”), in particular the law of 10 August 1915 on commercial companies, as amended (the “**Commercial Companies Law**”).

2. ARTICLE 2.-

- 2.1 The Company has its registered office in the City of Luxembourg, Grand Duchy of Luxembourg.
- 2.2 The registered office may be transferred within the Grand Duchy of Luxembourg by decision of the board of directors of the Company (the “**Board of Directors**”). The Board of Directors is authorised to amend these Articles to reflect the change of registered office and to proceed to such formalities as may be required under Luxembourg Law.
- 2.3 The registered office of the Company may be transferred outside the Grand Duchy of Luxembourg by means of a resolution of the shareholders adopted at a general meeting of shareholders of the Company (the “**General Meeting**”) under the conditions required by these Articles.
- 2.4 The Company may have offices and branches (whether or not a permanent establishment) both in Luxembourg and abroad.
- 2.5 In the event that the Board of Directors should determine that extraordinary political, economic or social developments have occurred or are imminent that would interfere with the normal activities of the Company at its registered office or with the ease of communication between such office and persons abroad, the registered office may be temporarily transferred abroad until the complete cessation of these extraordinary circumstances; such temporary measures shall have no effect on the nationality of the Company which, notwithstanding the temporary transfer of its registered office, will remain a Luxembourg company. Such temporary measures will be taken and notified to any interested parties by the Board of Directors.

3. ARTICLE 3.-

The Company is established for an unlimited period of time.

4. ARTICLE 4.-

The Company's purpose is:

- 1) To take participations and interests, in any form whatsoever, in any commercial, industrial, financial or other, Luxembourg or foreign companies or enterprises;
- 2) To acquire through participations, contributions, underwriting, purchases or options, negotiation or in any other way any securities, rights, patents and licenses and other property, rights and interest in property as the Company shall deem fit;
- 3) Generally to hold, manage, develop, sell or dispose of the same, in whole or in part, for such consideration as the Company may think fit, and in particular for shares or securities of any company purchasing the same;
- 4) To enter into, assist or participate in financial, commercial and other transactions;
- 5) To grant to any holding company, subsidiary, or fellow subsidiary, or any other company which belong to the same group of companies as the Company (the "**Affiliates**") any assistance, loans, advances or guarantees (in the latter case, even in favour of a third-party lender of the Affiliates);
- 6) To borrow and raise money in any manner and to secure the repayment of any money borrowed;
- 7) To carry out any trade, business or commercial activities whatsoever, including but not limited to the purchase, exchange and sale of goods and/or services to third parties; and
- 8) Generally to do all such other things as may appear to the Company to be incidental or conducive to the attainment of the above objects or any of them.

The Company can perform all commercial, technical and financial operations, connected directly or indirectly in all areas as described above in order to facilitate the accomplishment of its purpose, provided always that the Company will not enter into any transaction which would constitute a regulated activity of the financial sector without due authorisation under Luxembourg Law.

TITLE II - CAPITAL, SHARES

5. ARTICLE 5.

- 5.1 The subscribed share capital is set at USD 133,320,513 (one hundred thirty-three million three hundred twenty thousand five hundred thirteen United States Dollars) divided into 133,320,513 (one hundred thirty-three million three hundred twenty thousand five hundred thirteen) shares having a nominal value of USD 1 (one United States Dollar) each (the "**Shares**").
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- 5.2 The Shares can only be in registered form.
- 5.3 The Company may, without limitation, accept equity or other contributions without issuing Shares or other securities in consideration for the contribution and may credit the contributions to one or more accounts. Decisions as to the use of any such accounts are to be taken by the Board of Directors subject to the Commercial Companies Law and these Articles. For the avoidance of doubt, any such decision may, but need not, allocate any amount contributed to the contributor.
- 5.4 The subscribed share capital and any Authorised Capital (as defined below) may be increased by a resolution of the General Meeting adopted in accordance with the conditions required for the amendment of the Articles and in accordance with Luxembourg Law.
- 5.5 The Company may reduce its subscribed share capital and its Authorised Capital (as defined below) subject to a decision of the General Meeting, as provided in the Commercial Companies Law.
- 5.6 All Shares must be fully paid up on issue by contributions in cash or in kind.
- 5.7 The Company may have a sole shareholder. The death or dissolution of a sole shareholder will not result in the dissolution of the Company.
- 5.8 In addition to the issued and subscribed share capital of USD 133,320,513.- (one hundred thirty-three million three hundred twenty thousand five hundred thirteen United States Dollars), the Company has also an authorised, but unissued and unsubscribed share capital set at USD 231,924,819 (two hundred thirty-one million nine hundred twenty-four thousand eight hundred nineteen United States Dollars) (the "**Authorised Capital**").

The Board of Directors is authorised and empowered within the limits of the Authorised Capital to (i) approve any increase of the share capital or equity of the Company with or without the issuance of new Shares. The Board of Directors is authorised to issue such new Shares in one or several issues and (ii) issue bonds, preferred equity certificates, warrants, options or other instruments convertible, exchangeable or exercisable into new Shares and to issue new Shares further to the conversion or exercise of the above mentioned instruments, it being understood that (a) if such instruments are issued before or during the period set forth in the paragraph below, the new Shares upon the conversion or exercise of such instruments may be issued after the expiry of said period and (b) the Board of Directors is authorised to issue such new Shares in one or several issues. The foregoing authorisation can only be exercised by the Board of Directors (i) in the context of a public offering of Shares on a stock exchange, either regulated or not, in the European Economic Area, the United States of America or Canada, or (ii) if a public offering of Shares on a stock exchange, either regulated or not, in the European Economic Area, the United States of America or Canada already occurred, as the Board of Directors may deem fit.

Such authorisation conferred to the Board of Directors will expire five (5) years after the date of the General Meeting held on 11 August 2017 and can be renewed in accordance with the applicable legal provisions by a resolution of the General Meeting, it being understood that the Board of Directors can proceed to an increase of share capital or issue of the above mentioned instruments as of the date of the General Meeting held on 11 August 2017.

The Board of Directors is authorised to determine the conditions of any capital increase and the issuance of new Shares and the instruments to be issued in accordance with the above provisions through contributions in cash or in kind, among others, by the conversion of debt into equity, by offsetting receivables, by the incorporation of reserves, issue premiums or retained earnings, with or without the issue of new Shares, or following the issue and the exercise of subordinated or non-subordinated bonds, convertible into or repayable by or exchangeable for Shares (whether provided in the terms at issue or subsequently provided), or following the issue of bonds with warrants or other rights to subscribe for Shares attached, or through the issue of stand-alone warrants or any other instrument carrying an entitlement to, or the right to subscribe for, Shares .

The new Shares to be issued in accordance with the provisions of this article may be issued with or without share premium, it being understood that (i) such Shares shall not be issued at a price below the nominal value or any other minimum price required pursuant to the rules and regulations of any stock exchange on which part or all of the Shares of the Company are listed and (ii) if the consideration payable to the Company for such newly issued Shares exceeds their par value, the excess is to be treated as share premium in respect of such shares in the books of the Company. The new Shares may be issued to the existing or new shareholders.

The Board of Directors may approve the issuance of new Shares and, where applicable, the instruments to be issued in accordance with the provisions of this article without reserving (i.e. by cancelling or limiting) the preferential right to subscribe for such Shares and instruments for the existing shareholders so long as such issuance of new Shares and instruments is carried out through a public offering process.

The Board of Directors is authorised to determine the place and date of the issue or the successive issues, the issue price, the terms and conditions of the subscription of and paying up on the new Shares (referred to in this article) and, if applicable, the duration, amortization, other rights (including early repayment), interest rates, conversion rates and exchange rates of the aforesaid instruments (referred to in this article) as well as all the other conditions and terms of such instruments including as to their subscription, issue and payment.

The Board of Directors is authorised to perform all acts and execute all documents necessary to amend this article of these Articles in order to record the change of issued and authorised share capital following any increase pursuant to the present article. The Board of Directors is empowered to take or authorise the actions required for the execution and publication of such amendment in accordance with the Commercial Companies Law. Furthermore, the Board of Directors may delegate to any duly authorised person, the duties of accepting subscriptions, conversions or exchanges and receiving payment for Shares, bonds, preferred equity certificates, warrants, options or instruments and to perform all acts and execute all documents necessary to amend this article of these Articles in order to record the change of issued and authorised share capital following any increase pursuant to the present article.

- 5.9 The Company may, to the extent and under the terms permitted by Luxembourg Law, purchase its own Shares or cause them to be repurchased by its subsidiaries.
- 5.10 The Company shall consider the person in whose name the Shares are recorded in the register of shareholders to be the owner of those Shares.
- 5.11 Only if a public offering of Shares on a stock exchange, either regulated or not, in the European Economic Area, the United States of America or Canada occurred and in case Shares are recorded in the register of shareholders on behalf of one or more persons in the name of a securities settlement system or the operator of such a system or in the name of a professional depository of securities or any other depositary (such systems, professionals or other depositaries being referred to hereinafter as "**Depositaries**") or of a sub-depository designated by one or more Depositaries, the Company—subject to a confirmation in proper form received from the Depository—will permit those persons to exercise the rights attaching to those Shares, including admission to and voting at General Meetings. The Board of Directors may determine the requirements which such confirmations must comply with.
- 5.12 Confirmations that an entry has been made in the register of shareholders will be provided to shareholders directly recorded in the register of shareholders or, in case of Depositaries or sub-depositaries recorded in the register, upon their request. Except for transfers in accordance with the rules and regulations of the relevant Depository, the transfer of Shares shall be made by a written declaration of transfer recorded in the register of shareholders and dated and signed by the transferor and the transferee or by their duly-appointed agents. The Company may accept any other document, instrument, writing or correspondence as sufficient proof of the transfer.

TITLE III - MANAGEMENT

6. ARTICLE 6.-

- 6.1 The Company shall be managed by a board of directors comprising at least five (5) members and a maximum of eleven (11) members (each a "**Director**" and together the "**Directors**"), who shall be appointed by the General Meeting in accordance with Article 14.17.1. The Board of Directors shall at all times be composed as required pursuant to applicable law, including, if applicable, the rules and regulations of any stock exchange on which part or all of the Shares of the Company are listed. In particular, at least three (3) Directors shall meet the independence and financial literacy requirements for audit committee members set forth in the listing rules of the New York Stock Exchange, Toronto Stock Exchange, or any stock exchange on which any Shares of the Company are then listed and any additional requirements under the rules and regulations of the U.S. Securities and Exchange Commission, Canadian securities laws and other applicable law, subject to any available exemptions.
- 6.2 The Directors, whether shareholders or not, are appointed for a period not exceeding one (1) year (renewable) by the General Meeting, which may at any time and "ad nutum" remove them.

- 6.3 The number of Directors and the overall remuneration of the Board of Directors are determined by the General Meeting. The Board of Directors determines the remuneration of each Director based on the total amount determined by the General Meeting.
- 6.4 Any Director may resign at any time by delivering his or her resignation in writing or by electronic transmission to the Chairman (as defined below) or to the Board of Directors. Such resignation shall be effective upon receipt by the Company unless it is specified therein to be effective at some later time, and the acceptance of a resignation shall not be necessary to make it effective unless such resignation specifies otherwise.
- 6.5 In the event that a Director appointed by the General Meeting ceases to be a Director for any reason, the remaining Directors, by a simple majority vote of the Directors present or represented, shall fill such vacancy by replacing such Director with a new Director nominated for appointment in place thereof. This Director will be in office up to the next General Meeting taking place.
- 6.6 Any Director may be suspended or dismissed at any time by a resolution of the General Meeting adopted at a simple majority.

7. ARTICLE 7.-

- 7.1 The Board of Directors shall elect from its members a chairman (the “**Chairman**”) and who may choose a secretary, who need not be a director and who shall be responsible for keeping the minutes of the meetings of the Board of Directors. The Chairman will preside at all meetings of the Board of Directors. In his absence, the other members of the Board of Directors will appoint another chairman pro tempore, by simple majority vote of the Directors present or represented at such meeting, who will preside at the relevant meeting.
- 7.2 The Board of Directors is convened upon call by the Chairman or at least three (3) Directors, as often as the interest of the Company so requires, and at least once every quarter during each accounting year unless otherwise agreed in writing by the Board of Directors.
- 7.3 Written notice, to be delivered by e-mail, electronic means or by any other suitable communication means, of any meeting of the Board of Directors shall be given to all the Directors at least 5 (five) Business Days in advance of the date set for such meeting, except in circumstances of emergency, in which case the nature of such circumstances shall be set forth briefly in the convening notice of the meeting of the Board of Directors.
- 7.4 No such written notice is required if all the members of the Board of Directors are present or represented during the meeting and if they state to have been duly informed, and to have had full knowledge of the agenda of the meeting. The written notice may be waived by the consent in writing, whether by mail, email or any similar means, of each member of the Board of Directors.
- 7.5 No separate notice is required for meetings held at times and places specified in a schedule previously adopted by a resolution of the Board of Directors.

- 7.6 Any director may act at any meeting of the Board of Directors by appointing in writing, whether in original, by mail or email, another Director as his or her proxy. A Director may represent more than one of his or her colleagues, provided that at least two directors are present in person or participate by conference telephone or similar means in any meeting.
- 7.7 The Board of Directors can validly debate and take decisions only if at least the majority of its members is present or represented. Resolutions of the Board of Directors are only validly adopted if carried by a majority of the votes of the members of the Board of Directors present or represented. In case of a tie vote, the matter shall be deferred by the Chairman.
- 7.8 Directors may participate in a meeting of the Board of Directors by means of conference telephone or similar communications equipment allowing the identification of each participating Director and by means of which all persons participating in the meeting can hear and speak to each other on a continuous basis, and such participation in a meeting will constitute presence in person at the meeting, provided that all actions approved by the Directors at any such meeting will be reproduced in writing in the form of resolutions.
- 7.9 The deliberations of the Board of Directors shall be recorded in the minutes, which have to be signed by the Chairman and by the secretary of the Board of Directors. Any transcript of or excerpt from these minutes shall be signed by the Chairman or by the secretary of the Board of Directors.
- 7.10 Resolutions in writing signed by all members of the Board of Directors will be as valid and effective as if passed at a meeting duly convened and held. The signatures of such resolutions may appear on a single document or multiple counterparts of an identical document and may be evidenced by mail, email or any similar means. Resolutions adopted in accordance with this procedure are deemed to have been taken at the registered office of the Company.

8. ARTICLE 8.-

- 8.1 The Board of Directors is vested with the powers to perform all acts of administration and disposition in compliance with the corporate object of the Company, with the exception of the powers reserved by Luxembourg Law or by the Articles to the General Meeting.
- 8.2 The Board of Directors may establish and dissolve committees including, but not limited to, an audit committee, a compensation, nominating and governance committee, and a finance committee, set forth their respective duties, approve the internal regulations of those committees, elect the respective members thereof and define and approve, based on the total amount determined by the General Meeting, the remuneration of the members of such committees, including as required pursuant to applicable law (including the rules and regulations of any stock exchange applicable to the Company). Such committee members shall exercise their duties under the responsibility of the Board of Directors.

9. ARTICLE 9.-

- 9.1 Subject as provided by Luxembourg Law and these Articles, the Company is validly bound or represented towards third parties by:
- 9.1.1 the joint signature of two (2) Directors;
 - 9.1.2 if the Board of Directors of the Company has delegated certain powers to a Management Committee (as defined in Article 10), by the joint signature of two (2) Managing Officers, but only within the limits of such delegated powers;
 - 9.1.3 if a sole Daily Manager (as defined in Article 11.1) has been appointed, the Company will be bound by the sole signature of such Daily Manager to the extent powers have been delegated to him under Article 11.1 but only within the limits of such delegated powers;
 - 9.1.4 if more than one Daily Manager as defined in Article 11.1 has been appointed, the Company will be bound by the joint signature of two Daily Managers, provided however that if different classes of Daily Managers (namely class A Daily Managers and class B Daily Managers) are appointed, the Company will be bound by the joint signature of two Daily Managers including at least the signature of one class A Daily Manager (including by way of representation), to the extent powers have been delegated to them under Article 11.1 but only within the limits of such delegated powers; or
 - 9.1.5 the sole signature or joint signature of any other person(s) to whom such a power has been delegated in accordance with Article 11.2 to the extent such a power has been delegated to him/them, but only within the limits of such delegated powers.

10. ARTICLE 10.-

- 10.1 The Board of Directors may delegate its powers to conduct the management and affairs of the Company, except the general guidance of the Company's business and the acts reserved by the Commercial Companies Law to the Board of Directors, and the representation of the Company for such management and affairs to a management committee (the "**Management Committee**") comprising at least three (3) members and a maximum of seven (7) members, who need not be shareholders or Directors (each a "**Managing Officer**").
- 10.2 The Managing Officers are appointed by the Board of Directors of the Company for a period not exceeding one (1) year (renewable) which may at any time and "ad nutum" remove and replace them. Their remuneration is determined by the Board of Directors.
- 10.3 Any Managing Officer may resign by delivering his or her resignation in writing or by electronic transmission to the Chairman of the Board of Directors, and such resignation shall be effective upon receipt unless it is specified to be effective at a later time. If a resignation is made effective at a later date and the Company accepts the future effective date, the Board of Directors may fill the pending vacancy by a simple majority vote of the Directors present or represented at the meeting, before the effective date if the Board of Directors provides that the successor shall not take office until the effective date.

- 10.4 The Board of Directors shall appoint, by a simple majority vote of the Directors present or represented at the meeting, a chairman to the Management Committee. The chairman shall preside at all meetings of the Management Committee. In case of absence of the chairman, the Management Committee shall be chaired by a Managing Officer present and appointed for that purpose.
- 10.5 The Management Committee shall meet when convened by the chairman of the Management Committee or any two (2) Managing Officers.
- 10.6 Notice of any meeting of the Management Committee shall be given to all Managing Officers at least three (3) days in advance of the time set for such meeting except in the event of emergency, the nature of which is to be set forth in the minutes of the meeting.
- 10.7 Any convening notice shall specify the time and place of the meeting and the nature of the business to be transacted.
- 10.8 Convening notices can be given to each Managing Officer, in writing or by e-mail, electronic means or by any other suitable communication means.
- 10.9 The notice may be waived by the consent, in writing or by e-mail, electronic means or by any other suitable communication means, of each Managing Officer.
- 10.10 The meeting will be duly held without prior notice if all the Managing Officers are present or duly represented.
- 10.11 No separate notice is required for meetings held at times and places specified in a schedule previously adopted by a resolution of the Management Committee.
- 10.12 Any Managing Officer may act at any meeting of the Management Committee by appointing in writing or by e-mail or electronic means another Managing Officer as his/her/its proxy.
- 10.13 A Managing Officer may represent more than one Managing Officer, provided that at least 2 (two) Managing Officers are physically present or attend by phone, videoconference or any other suitable communication means at any meeting of the Management Committee.
- 10.14 The Managing Officers may participate in a meeting of the Management Committee by phone, videoconference, or any other suitable telecommunication means allowing all persons participating in the meeting to hear each other at the same time.
- 10.15 The Management Committee can validly deliberate and act only if a majority of its members are present or represented.
- 10.16 Resolutions of the Management Committee are adopted by the majority of the Managing Officers participating at the meeting or duly represented thereto.

- 10.17 The deliberations of the Management Committee shall be recorded in the minutes, which have to be signed by the chairman, and shall be transmitted to the Board of Directors. Any transcript of or excerpt from these minutes shall be signed by the chairman or any two Managing Officers.
- 10.18 Resolutions in writing approved by all Managing Officers shall have the same effect as resolutions passed at a Management Committee's meeting. In such cases, written resolutions can either be documented in a single document or in several separate counterparts having the same content and such counterparts shall be transmitted to the Board of Directors. Resolutions adopted in accordance with this procedure are deemed to have been taken at the registered office of the Company.
- 10.19 Written resolutions may be transmitted by mail, e-mail, electronic means, or any other suitable telecommunication means.
- 10.20 Without prejudice to the general management powers of the Board of Directors set forth in Article 8.1, if a Management Committee is established, such Management Committee will in particular be in charge of the following matters:
- 10.20.1 appointment and removal of the Daily Managers (as defined below);
 - 10.20.2 generally all acts or transactions involving the Company with an individual amount of up to USD 100,000,000.00 (one hundred million United States Dollars); and
 - 10.20.3 any other specific tasks that may be conferred to the Management Committee by the Board of Directors as determined in the relevant resolution of the Board of Directors to that effect.

11. ARTICLE 11.-

- 11.1 The day-to-day management of the business of the Company and the power to represent the Company with respect thereto may be delegated by decision of the Management Committee, if any has been established, or otherwise by decision of the Board of Directors, to one or more Directors, members of the Management Committee, officers or other agents (each a "**Daily Manager**"), acting either alone or jointly, as determined in the relevant appointing decision. The Board of Directors or the Management Committee, as the case may be, may decide to appoint Daily Managers of two (2) different classes, namely class A Daily Managers and class B Daily Managers. Any such classification of Daily Managers shall be duly recorded in the relevant appointing decision and the Daily Managers be identified with respect to the class they belong to. A majority of the Daily Managers shall be resident in Luxembourg.
- 11.2 The Board of Directors or the Management Committee, if any, may delegate any of their powers for specific tasks to one or more ad hoc agents, Directors, Managing Officers, Daily Managers and may remove any such agent(s) and will determine any such agent's powers and responsibilities and remuneration (if any), the duration of the period of representation, which shall not exceed 3 (three) years, and any other relevant conditions of such agent's agency.

12. **ARTICLE 12.-**

Any litigation involving the Company, either as plaintiff or as defendant, will be handled in the name of the Company by the Board of Directors represented by its Chairman, after due deliberation of the Board of Directors as set in Article 7, or by any member of the Management Committee, officer, employee or attorney-in-fact delegated for this purpose by the Board of Directors of the Company.

TITLE IV - SUPERVISION

13. **ARTICLE 13.-**

- 13.1 The Company is supervised by one or more independent auditors (*réditeur(s) d'entreprises agréé(s)*) (the “**Independent Auditors**”), which are appointed by a General Meeting.
- 13.2 Their term of office must not exceed one (1) year. Independent Auditors may be re-elected. In the event that an Independent Auditor is appointed without any indication of the term of his appointment, his term is deemed to be one (1) year.
- 13.3 An Independent Auditor may only be removed by a General Meeting for cause in accordance with Luxembourg Law or with the Independent Auditors’ approval.

TITLE V. - GENERAL MEETING

14. **ARTICLE 14.-**

- 14.1 The annual General Meeting shall be held in Luxembourg at the address of the registered office of the Company or at such other place as may be specified in the convening notice of the meeting within 6 (six) months after the end of the accounting year as set out in Article 15.
- 14.2 Other meetings of the shareholders of the Company may be held at such place and time as may be specified in the respective convening notices of the meeting.
- 14.3 Any shareholder may participate in a General Meeting by conference call, video conference or similar means of communications equipment whereby (i) the shareholders attending the meeting can be identified, (ii) all persons participating in the meeting can hear and speak to each other, (iii) the transmission of the meeting is performed on an on-going basis and (iv) the shareholders can properly deliberate, and participating in a meeting by such means shall constitute presence in person at such meeting.
- 14.4 Except as otherwise required by Luxembourg Law, by the rules of the New York Stock Exchange, Toronto Stock Exchange, or any stock exchange on which any Shares of the Company are then listed and any additional requirements under the rules and regulations of the U.S. Securities and Exchange Commission, Canadian securities laws and other applicable law or by these Articles, General Meetings shall be convened by the Board of Directors with at least a 30 (thirty) days prior notice. The quorum provided for by Luxembourg Law shall govern the notice for, and the conduct of, the General Meetings.

- 14.5 The convening notices shall be sent by registered letter or, alternatively, in any manner as set forth in applicable law or in these Articles.
- 14.6 The convening notice may be sent to a shareholder by any other means of communication having been accepted by such shareholder. Alternative means of communication are email, fax, ordinary letter and courier services.
- 14.7 Only the contact details on record with the Company at least five (5) days before the issue by the Board of Directors of any notice to such shareholder shall be valid and binding on the Company. The Board of Directors shall at the registered office keep a list of the email addresses communicated by the shareholders to the Company and no third party other than the notary recording shareholder decisions shall have access to such a list.
- 14.8 Any shareholder may change its street address or email address or revoke its consent or deemed consent to alternative means of convening provided that its revocation or its new contact details are received by the Company no later than five (5) days before the issue of any notice. The Board of Directors is authorised to ask for confirmation of such new contact details by sending a registered letter or an email, as appropriate, to this new street address or email address. If the shareholder fails to confirm its new contact details, the Board of Directors shall be authorised to send any subsequent notice to the previous contact details.
- 14.9 The Board of Directors as well as the Statutory Auditor may convene a General Meeting. They shall be obliged to convene it so that it is held within a period of one month, if shareholders representing 1/10th (one tenth) of the Company's share capital require it in writing, with an indication of the agenda. One or more shareholders representing at least 1/10th (one tenth) of the subscribed capital may require the entry of one or more items on the agenda of any General Meeting. This request must be addressed to the Company at least 10 (ten) days prior to the relevant General Meeting.
- 14.10 Each share is entitled to one vote.
- 14.11 Any shareholder may in abidance with statutory rules vote in person or through a proxy. A shareholder may act at any General Meeting by appointing any other natural or legal person who need not be a shareholder as its proxy in writing whether in original, by telefax, or e-mail to which an electronic signature (which is valid under Luxembourg law) is affixed. Such proxy shall enjoy the same rights to speak and ask questions during the General Meeting as those to which the shareholder thus represented would be entitled. All the proxies must be received by the Company no later than the day preceding the fifth (5th) Business Day before the General Meeting unless the Board of Directors fixes a shorter period. A person acting as proxy may represent more than one shareholder.
- 14.12 Except as otherwise required by Luxembourg Law, the rules of the New York Stock Exchange, Toronto Stock Exchange, or any stock exchange on which any Shares of the Company are then listed and any additional requirements under the rules and regulations of the U.S. Securities and Exchange Commission, Canadian securities laws and other applicable law or by these Articles, resolutions at a duly convened General Meeting will be adopted by a simple majority of those present or represented and voting.

- 14.13 If all the shareholders of the Company are present or represented at a General Meeting, and consider themselves as being duly convened and informed of the agenda of the meeting, the meeting may be held without prior notice.
- 14.14 The minutes of the General Meeting will be signed by the members of the bureau of the General Meeting and by any shareholder who wishes to do so.
- 14.15 However, in case decisions of the General Meeting have to be certified, copies or extracts for use in court or elsewhere must be signed by the Chairman of the Board of Directors or by the secretary of the meeting.
- 14.16 Each shareholder may vote through voting forms in the manner set out in the convening notice in relation to a General Meeting. The shareholders may only use voting forms provided by the Company and which contain at least the place, date and time of the meeting, the agenda of the meeting, the proposal submitted to the decision of the meeting, as well as for each proposal three boxes allowing the shareholder to vote in favour, against, or abstain from voting on each proposed resolution by ticking the appropriate box. Voting forms which show neither a vote in favor, nor against the resolution, nor an abstention, shall be void. The Company will only take into account voting forms received three (3) days prior to the General Meeting to which they relate and which comply with the requirements set out on the convening notice.
- 14.17 Without prejudice to any legal requirements in relation to such matters being approved by a meeting of the Board of Directors and without prejudice of any other matters that must be approved by the General Meeting according to Luxembourg Law, the General Meeting is in particular (but not limited to) vested with the rights and powers in relation to the matters set out in 14.17.1 and 14.17.2.
- 14.17.1 Decisions by the General Meeting with regard to the following matters shall be adopted by a simple majority of the votes validly cast, regardless of the portion of the capital represented:
- (a) approval of the annual accounts and respective inventory and balance sheet of the Company;
 - (b) distribution of dividends;
 - (c) appointment and removal of Directors, as provided in Article 6 above;
 - (d) appointment and removal of Independent Auditor(s), as the case may be, as provided in Article 13 above; and
 - (e) the appointment and dismissal of liquidators and judgment of their accounts.
- 14.17.2 Decisions by the General Meeting with regard to the following matters shall be adopted with a majority of two-thirds of the votes validly cast at a meeting in which holders of at least half of the Company's issued share capital are present or represented:
- (a) amendments to the Articles;

- (b) transfer of the registered office of the Company outside the Grand Duchy of Luxembourg;
 - (c) capital increases other than under the Authorised Capital and capital decreases; and
 - (d) the dissolution of the Company.
- 14.17.3 If the quorum requirement set out in the preceding paragraph is not satisfied, a second meeting may be convened, in the manner prescribed by these Articles or by the Commercial Companies Law. The second convening notice shall reproduce the agenda and indicate the date and the results of the previous notice.
- 14.18 Bondholders cannot attend a General Meeting. This does not preclude shareholders who are also bondholders to attend a General Meeting in their quality as shareholders of the Company.

TITLE VI - ACCOUNTING YEAR, ALLOCATION OF PROFITS

15. ARTICLE 15.-

The accounting year of the Company shall begin on the 1st of January and shall terminate on the 31st of December of each year.

16. ARTICLE 16.-

- 16.1 Each year on the 31st of December, the accounts are closed and the Board of Directors prepares an inventory including an indication of the value of the Company's assets and liabilities. Each shareholder may inspect the above inventory and balance sheet at the Company's registered office.
- 16.2 From the annual net profits of the Company, five per cent (5%) shall be allocated to the legal reserve. This allocation shall cease to be mandatory as soon and as long as such reserve amounts to ten per cent (10%) of the subscribed capital of the Company, as stated in article 5 hereof or as increased or reduced from time to time as provided in article 5 hereof.
- 16.3 The balance is at the disposal of the General Meeting.
- 16.4 Under the terms and conditions provided by the Luxembourg Law, the Board of Directors may proceed to the payment of interim dividends to the shareholder(s).
- 16.5 The share premium, if any, may be freely distributed to the shareholder(s) according to the Luxembourg Law by a resolution of the Board of Directors.

TITLE VII - DISSOLUTION, LIQUIDATION

17. ARTICLE 17.-

The Company may be dissolved by a resolution of the General Meeting. If the Company is dissolved, the liquidation will be carried out by one or more liquidators, physical or legal persons, appointed by the General Meeting, which will specify their powers and fix their remuneration.

TITLE VIII.- GENERAL PROVISIONS

18. ARTICLE 18.-

18.1 In these Articles:

- 18.1.1 a reference to:
 - (a) one gender shall include each gender;
 - (b) (unless the context otherwise requires) the singular shall include the plural and vice versa;
 - (c) a “**person**” includes a reference to any individual, firm, company, corporation or other body corporate, government, state or agency of a state or any joint venture, association or partnership, works council or employee representative body (whether or not having a separate legal personality);
 - (d) a statutory provision or statute includes all modifications thereto and all re-enactments (with or without modifications) thereof;
 - (e) a “**Business Day**” shall mean any day (other than a Saturday or a Sunday) on which banks in the Grand Duchy of Luxembourg are open for the conduct of non-automated banking operations.
- 18.1.2 the words “include” and “including” shall be deemed to be followed by the words “without limitation” and general words shall not be given a restrictive meaning by reason of their being preceded or followed by words indicating a particular class of acts, matters or things or by examples falling within the general words;
- 18.1.3 the headings to these Articles do not affect their interpretation or construction.

18.2 All matters not governed by these Articles are to be construed in accordance with the Commercial Companies Law, as amended.

List of Subsidiaries of Nexa Resources S.A.

Name of Subsidiary	Jurisdiction of Incorporation or Organization
Campos Novos Energia S.A.	Brazil
Compañía Minera Shalipayco S.A.C.	Peru
Compañía Magistral S.A.C.	Peru
Compañía Minera Doña Isabel Ltda.	Chile
Compañía Minera Gaico S.A.	Peru
Consórcio Capim Branco Energia	Brazil
Consórcio UHE Igarapava	Brazil
IncPac Holding Limited	British Virgin Islands
Inversiones Garza Azul S.A.C.	Peru
L.D.O.S.P.E. Empreendimentos e Participações Ltda.	Brazil
L.D.Q.S.P.E. Empreendimentos e Participações Ltda.	Brazil
L.D.R.S.P.E. Empreendimentos e Participações Ltda.	Brazil
Minera Bongará S.A.	Peru
Minera Cerro Colorado S.A.C.	Peru
Minera Chambará S.A.C.	Peru
Minera Pampa de Cobre S.A.C.	Peru
Mineração Dardanelos Ltda.	Brazil
Mineração Parnamirim Ltda.	Brazil
Mineração Santa Maria Ltda.	Brazil
Mineração Soledade Ltda.	Brazil
Nexa Resources Atacocha S.A.A.	Peru
Nexa Resources Cajamarquilla S.A.	Peru
Nexa Resources El Porvenir S.A.C.	Peru
Nexa Recursos Minerais S.A.	Brazil
Nexa Resources Peru S.A.A.	Peru
Nexa UK Limited	United Kingdom
Nexa US Inc.	United States

Otavi Mining Investments (Proprietary) Ltd.	Namibia
Otjitembo Mining (Proprietary) Ltd.	Namibia
Pollarix S.A.	Brazil
Rayrock Antofagasta S.A.C.	Peru
SMRL Ltda. Pepita 1	Peru
SMRL CMA nº 54	Peru
Votorantim Andina S.A.	Chile
Votorantim GMBH	Austria
Votorantim Investimento Latino Americano S.A.	Brazil
Votorantim Metals Canada Inc.	Canada
Votorantim Metals Namibia (Proprietary) Ltd.	Namibia

I, Tito Botelho Martins Junior, certify that:

1. I have reviewed this annual report on Form 20-F of Nexa Resources S.A.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the company as of, and for, the periods presented in this report;
4. The company's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15-d-15(f)) for the company and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the company, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the company's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the company's internal control over financial reporting that occurred during the period covered by the annual report that has materially affected, or is reasonably likely to materially affect, the company's internal control over financial reporting.
5. The company's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the company's auditors and the audit committee of the company's board of directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the company's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the company's internal control over financial reporting.

/s/ Tito Botelho Martins Junior

Name: Tito Botelho Martins Junior
Title: Chief Executive Officer
Date: April 3, 2019

I, Rodrigo Nazareth Menck, certify that:

1. I have reviewed this annual report on Form 20-F of Nexa Resources S.A.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the company as of, and for, the periods presented in this report;
4. The company's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15-d-15(f)) for the company and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the company, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the company's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the company's internal control over financial reporting that occurred during the period covered by the annual report that has materially affected, or is reasonably likely to materially affect, the company's internal control over financial reporting.
5. The company's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the company's auditors and the audit committee of the company's board of directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the company's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the company's internal control over financial reporting.

/s/ Rodrigo Nazareth Menck

Name: Rodrigo Nazareth Menck
Title: Senior Vice President Finance and Group Chief Financial Officer
Date: April 3, 2019

Certification

Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
(Subsections (a) and (b) of Section 1350, Chapter 63 of Title 18, United States Code)

Pursuant to section 906 of the Sarbanes-Oxley Act of 2002 (subsections (a) and (b) of section 1350, chapter 63 of Title 18, United States Code), each of the undersigned officers of Nexa Resources S.A. (the “Company”), does hereby certify, to such officer’s knowledge, that:

The Annual Report on Form 20-F for the year ended December 31, 2018 (the “Form 20-F”) of the Company fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934 and information contained in the Form 20-F fairly presents, in all material respects, the financial condition and results of operations of the Company.

/s/ Tito Botelho Martins Junior

Name: Tito Botelho Martins Junior
Title: Chief Executive Officer
Date: April 3, 2019

/s/ Rodrigo Nazareth Menck

Name: Rodrigo Nazareth Menck
Title: Senior Vice President Finance and Group Chief Financial Officer
Date: April 3, 2019

A signed original of this written statement required by Section 906 of the Sarbanes-Oxley Act of 2002 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.
