

Brazil Country Mining Guide 2023



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ABOUT KPMG

Through helping other organizations mitigate risks and grasp opportunities, we can drive positive, sustainable change for clients, our people and society at large.

KPMG firms operate in 143 countries and territories, and in FY22, collectively employed more than 265,000 partners and people, serving the needs of business, governments, public-sector agencies, not-for-profits and through KPMG firms' audit and assurance practices, the capital markets. KPMG is committed to quality and service excellence in all that we do, bringing our best to clients and earning the public's trust through our actions and behaviors both professionally and personally.

KPMG has developed an international network of experienced professionals in the Mining industry. KPMG International's member firms operate in the three regions – Americas; Europe, Africa and Middle East; and Asia and Oceania –, each one with a dedicated team to the industry. This structure enables its professionals to strike the right balance between identifying and understanding domestic markets, thus helping ensure that they are able to implement global strategies and practices in a consistent manner.



KPMG in Brazil

In Brazil, approximately 5,000 professionals work in 22 cities located in 13 States and the Federal District. KPMG in Brazil has offices located in São Paulo (head office), Belém, Belo Horizonte, Brasília, Campinas, Cuiabá, Curitiba, Florianópolis, Fortaleza, Goiânia, Joinville, Londrina, Manaus, Osasco, Porto Alegre, Recife, Ribeirão Preto, Rio de Janeiro, Salvador, São Carlos, São José dos Campos and Uberlândia.

From small and middle-sized mining companies to large mining companies and from the beginning of the exploitation to the mining capping, KPMG in Brazil has the resources, technical knowledge and team focused on satisfying your needs.

In Brazil, KPMG relies on one of the largest Mining practices in the country, with professionals providing Audit, Tax and Advisory services focused on this industry. We provide services to approximately 60% of the major mining companies in the world



ABOUT IBRAM

IBRAM is a Brazilian private non-profit organization, with more than 130 associates responsible for 85% of Brazil's mineral production. It carries with it the essence and strength of the true #BrazilianMining.

This mining is the one aligned with sustainability. Inductive of good ESG (environment, social responsibility and governance) practices in everything it does. Ethical and transparent in its relationships with people. Inclusive. Influential and partner in initiatives that promote socioeconomic development and quality of life for people in general. All IBRAM's actions are directed toward building a new perspective for the future of Brazilian Mining by outlining strategies and leading the sector's transition to an even more productive scenario, with sustainability, safety and responsibility to all those around it.

In this sense, IBRAM works to strengthen the relationships between mining companies and their various publics, such as their professionals and suppliers, the government and society. It also works to connect the sector. Encourages innovation, disseminates knowledge, fosters and disseminates good practices, articulating business and development opportunities for the mining industry.

The Association is always open and willing to dialogue with other public and private organizations, with full knowledge of the facts, commitment and competence to listen, understand, propose, negotiate, motivate, engage and unite. Sustainable, responsible, closer to people and partner of the Country's development – this is the true #BrazilianMining.



01 Executive summary

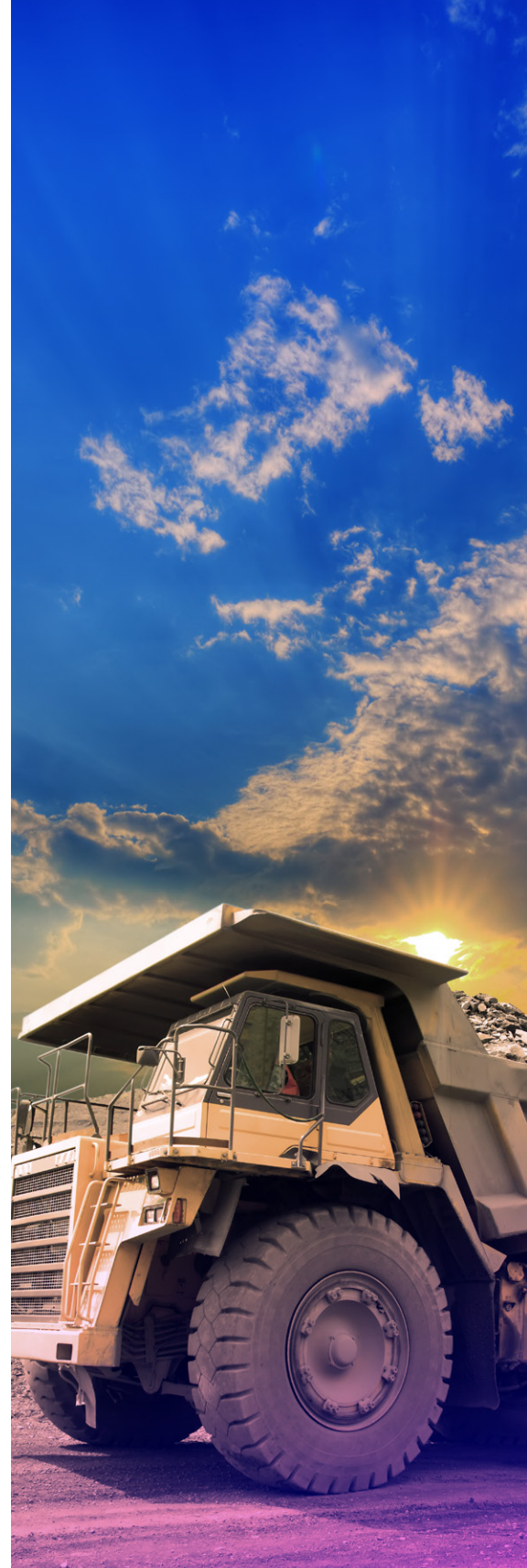
Brazil occupies a place among the top five mineral producers in the world - producing and marketing more than 90 mineral commodities. It is the world's largest producer of niobium and second largest of iron ore. The world's third largest mining company overall is the Brazilian Vale, leading iron ore production. Other important minerals from the Brazilian mining sector include gold, kaolin, nickel, coal and phosphates. It presents great opportunities, as the country possesses proven reserves of several strategic commodities and less than 50% of the territory is geologically mapped.

New mining operations require environmental licenses at three different stages of development – a preliminary environmental license, an installation license (before the start of construction), and an operational license.

The World Bank expectations of ongoing slowdown and likely global recession in the world economy, as well as a scenario of high interest rates and inflation in Brazil has affected minerals prices. Steel companies are more impacted and mining companies expect a recovery in the economic activity in China after governmental measures to boost construction sector.

Investment on the infrastructure front, however, is expected to grow in the near future, considering new government's declaration on governmental priorities. There are high expectations on investments not only in the energy sector, but also housing, water and sanitation. There are 45 assets in the transportation agenda for the next few years. The government has opted for private participation in infrastructure related projects in order to attract the required funds. However, President's declarations of reviewing recent regulatory frameworks advances from previous government has concerned the market.

There is a very good expectation for the new renewables technologies growth in Brazil, such as offshore wind and hydrogen, as it has an important potential to explore them. Brazil is one of the frontrunners in meeting the carbon-emission reduction targets. It has laid great emphasis on promoting the exploitation of renewable energy potential in the country. In 2021, the country generated 85 percent of its total electricity from renewable sources. In addition to having vast hydroelectricity potential, Brazil also had an estimated 20 GW in wind power potential in 2021 with 30.8 GW forecast by 2031. It is expected that solar will follow the same way, reaching at least 45.3 GW of installed capacity by 2031.



02 Country snapshot

BRAZIL

The Federative Republic of Brazil, commonly known as Brazil, is the fifth largest country in the world, and the third largest in the Americas, after the US and Canada.

GEOGRAPHY

Located in the eastern part of South America (10°00 S, 55°00 W) and spread over 8.510.345 square kilometers, Brazil is slightly smaller in size compared to the US.

CLIMATE

The climate in Brazil varies considerably with latitude and elevation. In the north, the climate is mostly tropical, while in the south, it is temperate. Brazil's climate is characterized by five climatic regions equatorial, tropical, semi-arid, highland tropical, and subtropical.

POPULATION

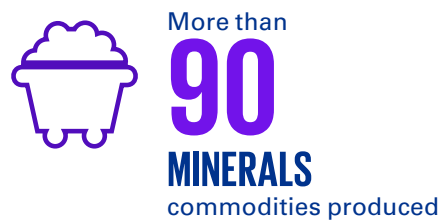
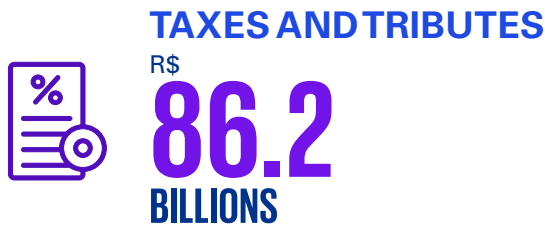
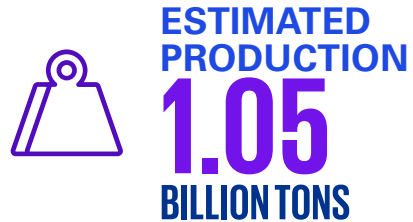
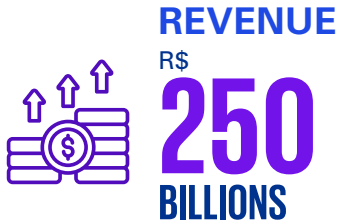
With an estimated population of 215.64 million, Brazil is the seventh most populated country in the world. The country's population is relatively young, with a median age of 32.6 years.

CURRENCY

Average exchange rate in Q4 2022 was: BRL5,25: US\$1

Figure 1: Country Snapshot

MINING IN BRAZIL



¹ Instituto Brasileiro de Geografia e Estatística 2022

² United Nations 2022

³ Banco Central 2023

03 EIU rankings: Ease of doing business⁴

Brazil ranked 51st among the 82 countries covered under the business environment ranking of the Economic Intelligence Unit (EIU). In the regional rankings of the South American region for 2017-21, which included 12 countries, Brazil ranked fifth.

Over the forecast period of 2022-26, EIU expects Brazil to slightly decreased rank (54st) globally. The 2022 electoral cycle has delayed efforts to consolidate the public finances, improve the business environment and enact structural reforms. According to EIU, some factors are likely to limit Brazil's growth such as poor effectiveness of the public sector; a burdensome tax system; poor infrastructure; weak market dynamics; shortages of skilled-labor; and failure to advance structural as well as growth-enhancing reforms, etc., along with softer Chinese demand and slower credit growth.

Brazil's overall business environment score rises in the 2022-26 forecast period

compared with the 2017-21 historical period, but faster improvements in other countries mean that Brazil falls three places globally, to 54th, and one place regionally, to sixth. EIU expects increased adjustments of some economic policies in 2023 with new government, such as improvements in some categories of the business environment, foreign trade and exchange controls, and technological readiness. The labor market will strengthen but will remain a weak point overall.

Brazil's score for tax is unchanged, and it remains the weakest aspect of the overall investment climate by some margin. However, the tax reform is expected to be voted in Congress in the first half of 2023, which may affect positively this result.



Value of index ^A		Global rank ^B		Regional rank ^C	
2017-21	2022-26	2017-21	2022-26	2017-21	2022-26
5.81	6.27	51	54	5	6

Table 1: Ease of doing business

Note a. Out of 10

Note b. Out of 82 countries.

Note c. Out of 12 countries: Argentina, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Mexico, Peru and Venezuela.

⁴ EIU 2022

⁵ G1 2023

04 Type of government and judiciary^{6,7,8}

Brazil – a federal republic – is one of the largest democracies in the world. Voting is compulsory for every literate Brazilian resident between the ages of 18 and 69 years. The president, elected for a term of four years, is the head of the state and the government. The executive powers rest with the cabinet, which is appointed and headed by the president. Control over the budget also lies with the president.

Brazil has 26 states and 1 federal district, which constitute its administrative divisions.

The National Congress is the legislative body of Brazil that follows a bicameral structure.

The Federal Senate (the upper house) has 81 representatives (three from each of the 26 states and three from the federal district of Brasília).

The Chamber of Deputies (the lower house) has 513 directly elected members, with the number of deputies from each state proportional to the population of the state or Federal District, with a minimum limit of eight and a maximum of seventy for each. The members of the upper house serve for

an eight-year term, while those in the lower house serve for a four-year term.

The Supreme Federal Court is the highest court in the country, comprising 11 justices. The President appoints the justices and are approved by the Federal Senate. Each state has its own judicial system. The judicial system is responsible for contesting and supporting any decisions made by the government that affect the rights of Brazil's individual residents. In addition, the country has a system of courts to deal with disputes between states and matters that lie outside the jurisdiction of state courts.

In 2022, general elections were held to elect the president, vice president, the National Congress, the governors, vice governors, and legislative assemblies. Luiz Inácio Lula da Silva became president-elect of Brazil.



⁶ STF 2019

⁷ National Congress s.d

⁸ Brazilian Federal Constitution 1988



05 Economy and fiscal policy

Brazil is the world's twelfth largest economy according to the latest World Bank data. As per the 2021 estimates of World Bank data the nominal GDP of Brazil was \$1.60 trillion, while in terms of purchasing power parity it stood at \$3.43 trillion. Brazil is a well-diversified middle-income economy, with developed and large mining, manufacturing, and service sectors. The country's service, industry, and agriculture sectors contribute 57.8 percent, 20.2 percent, and 7.5 percent, respectively, to the total GDP. Most of the country's industries are located in its southern and southeastern regions.⁹

GDP Growth

After a pandemic-induced recession from COVID-19 in 2020 (-3.9 percent), the economy rebounded in 2021 (+5.0 percent). The post-pandemic recovery was mainly driven by the growth of industry, 4.8 percent, and the service sector, 5.3 percent, while agriculture sector had a lower increase, only 0.3 percent, due to adverse weather conditions such as drought and frost.¹⁰

However, the GDP growth rate has been increasing in the recent years. It was estimated at -3.5 percent in 2015, but the cumulative growth between 2015 and 2021 was 0.4 percent. In 2023, the Brazilian economy is expected to witness 0.8 percent growth.¹¹

Monetary and Fiscal Policy

Monetary and fiscal reforms introduced in 1994, which included the introduction of the current currency Real (R\$ or BRL), the launch of an extensive privatization program, and the focus shift on fiscal discipline, Brazil has significantly improved its macroeconomic stability.

The inflation rate was 5.79 percent in 2022, a drop from the previous year (10.06 percent) influenced by the improved global and domestic economic situation after the worst part of the COVID-19 pandemic with "price freeze" policies for transportation fuel.¹²

⁹ IBGE 2022

¹⁰ Banco Central 2022

¹¹ Banco Central 2022

¹² IBGE 2023

Economic stabilization, growth and inflation reduction are some of the priorities for the mandate of Brazil's new Finance Minister Fernando Haddad. The expectation is to create a new fiscal anchor in the first half of 2023, and to bring reliability, respect and viability to his fiscal policy with the support of the IMF. Despite this, the projected inflation rate for the current year has undergone successive increases, the most recent rate being 5.74 percent for 2023, according to data provided by the Brazilian Central Bank.

Foreign Trade

Foreign trade constituted nearly 40 percent of Brazil's GDP (World Bank estimates) in 2021, with

China, the US, and the EU being the largest trading partners.¹³

The total import and export for the year 2022 was US\$272.7 billion and US\$334.4 billion, respectively.¹⁴

Brazil has maintained a positive annual trade balance since 2014 and reached its highest value in 2022 with a surplus of \$61.7 billion. Exports in 2022 also reached the highest value in the historical series, up 19 percent from 2021. The value exported grew to Brazil's main trading partners, such as China (1.5 percent increase in the daily average, to a total of US\$ 91.3 billion), the European Union (39.6 percent increase to US\$ 51 billion), and the United States

(20.2 percent, to US\$ 37.4). The Agriculture and Livestock Sector was the one with the biggest growth in 2022 in relation to 2021, which showed an increase in the value of exports of 36.1 percent.¹⁵

Brazil has been maintaining a sizeable foreign reserve of US\$324.4 billion (as on December 31, 2021, Banco Central do Brasil estimates) in recent years. Its public debt has decreased from 78.3 percent of GDP in 2021 to 73.5 percent of GDP in 2021. Moreover, the current debt represents a regression compared to 2018 (77.3 percent of GDP). Brazil's external debt increased from US\$554.9 billion on December 31, 2020, to US\$567.5 billion as on December 31, 2021.¹⁶

Economic Statistics



Income level
Upper middle income



GDP (current US\$)
\$1.6 trillion (2021 estimates)¹⁷



Population (total)
215.6 million (January 2023 estimates)¹⁸



Unemployment rate
8.7% (3rd quarter 2022 estimates)¹⁹



Inflation rate
5.79% (2022 estimates)²⁰

¹³ Agencia Brasil 2023

¹⁴ Banco Central do Brasil 2023

¹⁵ MDIC 2023

¹⁶ IPEA 2022

¹⁷ World Bank 2022

¹⁸ IBGE 2023

¹⁹ IBGE 2022

²⁰ IBGE 2023

06 Fraser institute rankings

Economic Freedom of the World 2022²¹

Among the 165 countries covered in the Fraser Institute’s ‘Economic Freedom of the World 2022’ report, Brazil ranked 114th, increasing eight positions from its last year’s rank as it scored 6.33 on a scale of one to ten.

The annual peer-reviewed report ranked countries based on 42 data points to study the level of economic freedom in 165 countries. The report analyzes the business and political environment in terms of personal choice; voluntary exchange; freedom to enter markets and compete; and security of people and privately owned property in the following five broad areas:

- Size of government: expenditures, taxes, and enterprises
- Legal structure and security of property rights
- Access to sound money
- Freedom to trade internationally
- Regulation of credit, labor, and business

Survey of Mining Companies 2021²²

In 2021, Brazil ranked 51 on ‘Investment Attractiveness Index’ among the 84 countries in the Fraser Institute’s ‘Survey of Mining Companies 2021’. On other indexes such as Policy Perception and Best Practices Mineral Potential, Brazil ranked 68 and 40, respectively. Table 2 has the evolution of Brazil in the ranking position of the survey. Figure 2 provides the country’s scores evolution on the key indices of the survey.

BRAZILIAN POSITION, SURVEY OF MINING COMPANIES 2021	2017	2018	2019	2020	2021
POLICY PERCEPTION	66/91	57/83	39/76	56/77	68/84
MINERAL POTENTIAL	59/91	56/83	48/76	24/77	40/84
INVESTMENT ATTRACTIVENESS	65/91	58/83	46/76	38/77	51/84

Table 2: Brazilian position in the Mining Companies Survey

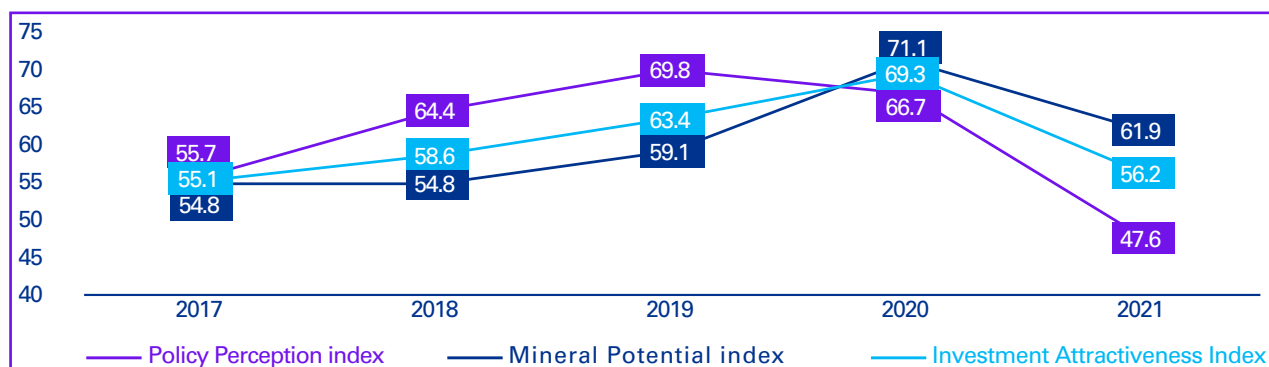


Figure 2: Brazil's scores, Survey of Mining Companies 2021

Note*: The Policy Perception Index is a composite index that measures the effects of government policy on attitudes toward exploration investment.

Note**: The Mineral Potential index is based on respondents’ answers to the question on the attractiveness of the region’s “pure” mineral potential independent of any policy restrictions. The index rates regions based on their geologic attractiveness.

Note***: The Investment Attractiveness Index is constructed by combining the Best Practices Mineral Potential index and the Policy Perception Index. The index reflects the perceived importance of policy versus mineral potential.

07 Regulatory environment ^{23,24,25}

Brazil has a complex regulatory framework, with jurisdiction and approval processes divided among municipal, state, and federal governments. At the federal level the main institutions involved directly in the mining sector are the ministry the Ministry of Mines and Energy (MME), the National Mining

Agency (ANM), and the Geological Service of Brazil (CPRM). However there are several entities involved in the Brazilian government’s regulation of safety, labor and environmental standards. Figure 3 shows federal institutions involved in the mining sector.

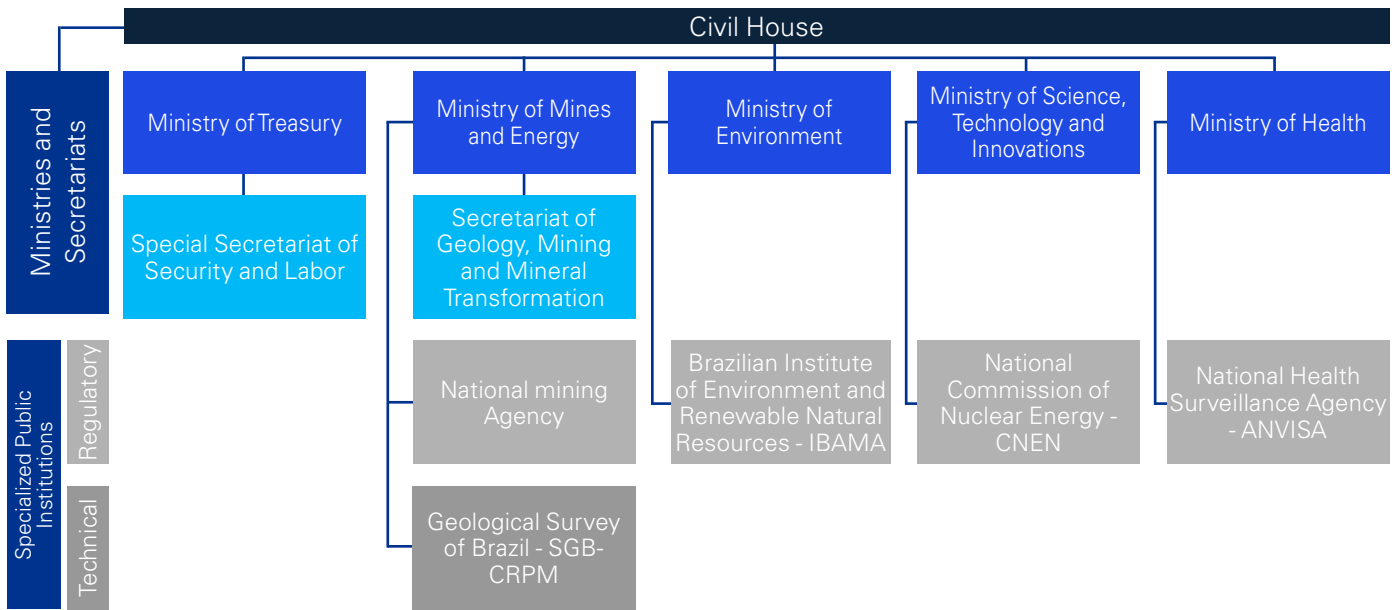


Figure 3: Structure of the federal institutions involved in the mining sector
Source: Ministério de Minas e Energia 2023

Ministry of Mines and Energy (MME)

The Ministry of Mines and Energy (MME) is responsible to create and guarantee the practice of public policies related to the sustainable use of energy and mineral resources in Brazil. It has 4 secretariats which are responsible for proposing national guidelines and policies in its areas of operation. The Secretariat of Geology, Mining and Mineral Transformation oversees the preparation and publication of global policies for the mining sector. It has also agencies that are responsible for regulation and/or supervision of the activities of the sectors linked to the body. The National Mining Agency is the one that manages the use of mining resources, as well as regulates and supervises activities involving the use of mining resources.

In addition, another function of the MME is to monitor and evaluate the performance of the geology, mining and mineral transformation sectors, with the objective of promoting updates and corrections in the existing regulatory models.

With respect to mining concessions, the MME issues concessions and decides on the validity or expiration of mining concessions for specific substances not covered by the ANM, such as metallic substances and mineral waters. Likewise, the MME authorizes the approval of the assignment or transfer of these mining concessions.

²³ Ministério de Minas e Energia 2023
²⁴ OECD 2022
²⁵ IBRAM 2019

The Secretariat of Geology, Mining and Mineral Transformation (SGM)

The Secretariat was created for the guidance, coordination and implementation of policies for the mineral sector. According to MME, the Secretariat is responsible for “conducting studies and proposing actions for the sustainable development of mining and mineral transformation, formulating and articulating proposals for multi-annual plans and programs, in addition to promoting and supporting research activities and improvement of technologies in the fields of geology and the mineral industry”.

The SGM has also the role of granting mining ordinances for metallic substances, mineral commodities and mineral water, as well as supervising the control and inspection of mineral goods exploration and production.

National Mining Agency (ANM):

The National Mining Agency (ANM for its acronym in Portuguese) is the regulatory body for the Brazilian mining sector. Created in 2017, It has replaced the National Department of Mineral Production (DNPM), in the process of modernizing the regulatory framework of the sector, including the enactment of a new Mining Code. Its main activities roles:

- Designs, implements and supervises compliance with the mining regulatory standard (NRM)
- Issue sanctions in case of breach of safety regulations
- Requests and consolidates information about the mining sector provided by mining rights holders
- Manages the mining registry and the registration of title deeds and mining rights
- Regulates the exchange of information on mining operations between authorities and entities of the Union, States, Federal District and States. Counties
- Grants mining titles: exploration licenses for all mineral substances and mining concessions for a certain group of minerals²⁶
- Collects and manages mining revenues and contributions from the Financial Compensation for the Operation of Mineral Resources (CFEM) , the Annual Fee per Hectare (TAH) and fines imposed by the same body

Geological Survey of Brazil (SGB-CPRM)

SGB-CPRM was founded in 1969 under the name of Mineral Resources Research Company – CPRM. Now, the Geological Survey of Brazil (SGB-CPRM) is the

federal agency responsible for geological mapping of the country, financed by the national treasury in accordance with governmental programs.

Other important institutions

According to the Federal Constitution of 1988, the Public Ministry has a function of Justice: the defense of unavailable social and individual rights; the defense of the legal order and the defense of the democratic regime. Thus, the institution has many interfaces with mining themes, involving not only investigation, but also law enforcement in cases of illegal mining, disasters, and environmental licenses.

The Ministry of Economy (ME) is responsible, among other activities, for the development of industry, commerce and services. The Special Secretariat for Social Security and Labor is one of the secretariats of the Ministry of Economy. It has overseen the development and implementation of labor. In the mining sector, the Special Secretariat for Social Security and Labor is responsible, together with the ANM, for regulating occupational hygiene and safety standards, and carries out work inspections and imposes the corresponding sanctions through its regional teams.

The Ministry of Environment is responsible for developing environmental regulations, while the National Council of Environment (CONAMA) implements these regulations, and the Brazilian Institute for Environment and Renewable Resources (IBAMA) acts as the primary licensing entity. However, most of the environmental licenses are granted by the state, not by the federal government. New mining operations require environmental licenses at three different stages of development – a preliminary environmental license, an installation license (before the start of construction) and an operational license (before the beginning of operations).

Specifically in relation to mineral water for human consumption, the National Health Surveillance Agency (ANVISA), linked to the Ministry of Health, has powers in relation to the pre-marketing phase. Another exception is the case of uranium. The National Nuclear Energy Commission, is also an autonomous government agency, linked to the Ministry of Science, Technology and Innovation. Regarding mining, CNEN is responsible for enforcing regulations on infrastructure and operational safety in uranium mines. The extraction of radioactive minerals is a state monopoly and CNEN provides the necessary technical standards for uranium mining operations.

²⁶ Sand and gravel for use in construction; rocks and other mineral substances, when equipped for cobblestones, guides, gutters, fences; clays for various industries; ornamental and coating stones; and calcium and magnesium carbonates used in different industries. The Ministry of Mines and Energy authorizes concessions for all other mineral substances.

Regulatory framework for the mining sector in Brazil

Brazilian general regulatory framework is rooted in the Federal Constitution (FC) by establishing how the Brazilian Union manages mineral resources. The Brazilian Mining Code, published in 1967, establishes the main regulations that are in force in the mining

sectors. Legal and regulatory framework has been modified over the years, however it still needs an update to support a modern and competitive mining industry. The development of Brazilian regulatory framework is shown in Figure 4.

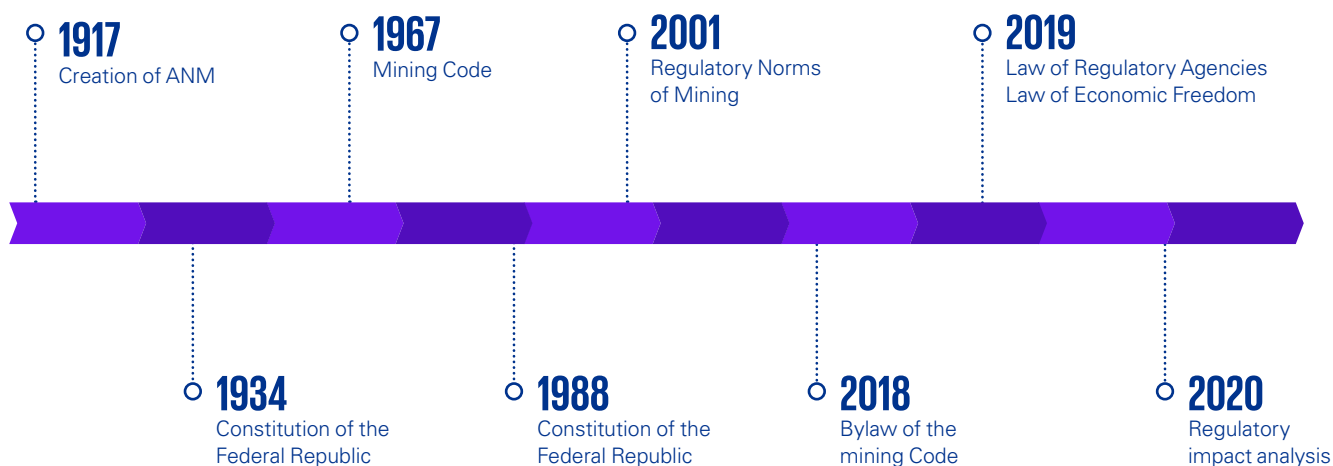


Figure 4: Development of the regulatory framework for the Brazilian mining industry
Source: OECD 2022

In Brazil, it is an exclusive competence of the Union to legislate on mineral resources (Article 22, XII of the FC). All mines and mineral resources are owned by Federal State (Union). The ownership of mineral resources is separated from land's ownership. The mining right-holder owns the product from the mining. Thus, exploration permit (Authorization) and mining concession are granted by the Union.

Geological surveys in Brazil play an important role in providing data to find new mineral deposits. They provide essential data that constitute one of the bases to support the regulatory framework of the mining sector. The Geological Survey of Brazil (SGB-CPRM) is the federal agency responsible for geological mapping of the country. At the state level, there are currently no significant initiatives for the development of geological mapping projects.

The geological surveys carried out by the SGB-CPRM are financed with resources from the national treasury in accordance with government programs within the Multi-Year Plans (PPA).¹³ The Directorate of Geology of Mineral Resources of the SGB-CPRM, through the Department of Geology, is responsible for executing the agency's geological mapping programs.

The selection of areas for geological mapping projects in the SGB-CPRM is fundamentally based on the strategic importance of each area, considering its mineral potential and level of previous geological knowledge. After the publication of the survey project results, the SGB-CPRM works on the dissemination of geological information, launching events, lectures at technical-scientific events or conferences.

The survey is used to define mining concessions. The data collected is publicly available for a variety of uses, including for private entities to define areas of interest requested from the ANM. The rules and procedures for obtaining a mining title are defined in the Mining Code and Decree No.

9,406/2018 (Regulation of the Mining Code, NRCM). It goes through the process of application for the Authorization and Concession Regimes, applies to the mineral research phase and the concession regime to mineral production. This process is summarized in figure 5:



Figure 5: Authorization and concessions regimes based on Brazilian Mining Code and Decree No. 9.406/2018. Source: OECD 2022

The process to obtain the environmental license follows the Authorization and Concessions Regimes process, as it can be seen in the figure 6:

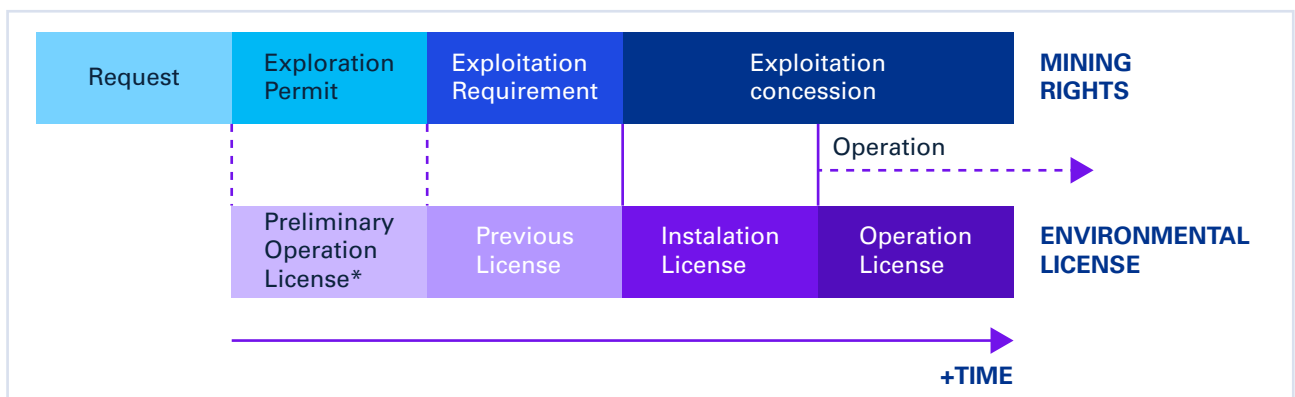


Figure 6: Mining Rights and Environmental License Source: IBRAM

Regulatory expectations for the mining sector

In the Official transition report²⁷ issued by the new federal government elected in 2022, there is a concern related to regulatory issues. Additionally, it is recognized that there is a lack geological knowledge and more research is needed.

ANM Regulatory Agenda (22-23)

ANM's Regulatory Agenda is an instrument to provide transparency for the establishment of priority project themes. In 22-23 ANM's agenda has six thematic axes:



- **Transversal:** main topics involve alternative means of conflict resolution, Areas availability / Regulatory Result Analysis (ARR); regulation of seizure and auction of substances and equipment from illegal mining and simplification of assignment and leasing of mineral rights.
- **Sustainability:** comprises financial guarantees or insurance to cover risks arising from mining activities. It also monitors the implementation of the entire Regulatory Agenda, together with the other organizational units of ANM.
- **Mineral research:** includes the production of the Final Mineral Research Report, determining the minimum content and rules for its presentation for aggregates, ornamental rocks and lining rocks. It develops issues related to the withdrawal of requests for mineral grants and the renunciation of mining titles and is linked to the regulation of the Electronic Request for Mineral Research (REPEM). Within its indicative agenda it also attaches importance to the regulation of art. 23 of Federal Decree No. 9,406/2018.
- **Mineral production:** involves topics related to the Mining Concession and the Economic Use Plan (PAE); licensing supporting the development of small businesses; among others, it also comprises the themes 'Mining Consortium', 'Globalization of areas', 'Amendment by simplified procedure' and 'Coexistence of rights over the same area
- **Mineral water:** involves, among other issues adequacy of technical regulations for mineral water to welcome new technologies and simplify procedures and compliance in telemetry systems to monitor mineral water extraction. Its agenda also includes the themes 'Mixing of water from different sources.
- **Inspection and Financial Compensation for Exploitation of Mineral Resources (CFEM):** it is related to the regulation of Federal Law No. 13,540/2017 concerning the determination of criteria for establishing the current price of mineral goods; the National Registry of the First Acquirer of mineral goods from the Mining Permission System and with the Regulation of the Annual Fee per Hectare (TAH), regarding the collection of TAH, among other topics.

²⁷ Law 10.609/2002 was created in order to provide conditions for the future President of the Republic to receive all the data and information necessary for his government. Findings from the transition process can be found in the Final Report of the Transition office.



08 BM&FBOVESPA Brazil exchange

BM&FBOVESPA listed mining companies (metallic minerals) – R\$ thousand ²⁸

Company	Ticker	NetWorth (mi)	Number of Shares Thousand (2021)
VALE	VALE	197,058,000	5,132,458
LITEL	LTEL	3,095,310	215,495
AURA MINERALS INC.	AURA	1,519	72,244
CBA	CBAV	4,715,981	595,833
CSN MINERACAO	CMIN	13,998,287	5,591,246

Table 3: BM&FBOVESPA listed mining companies (metallic minerals)
Source: B3; Emis; Financial statements of companies

²⁸ B3 2023



09 Sustainability and Environment

The mining sector poses significant environmental challenges. Recently, the mining industry in Brazil had two major environmental incidents (in Mariana 2015 and Brumadinho in 2019) that have significantly affected the industry. These dam breaks raised the bar of legislation and public scrutiny over mining companies' environmental practices. Other important trends are impacting the industry: climate change, biodiversity, and human rights.

Mining Waste Management

Most mining operations in Brazil still relies in tailings dams to manage byproducts of the activity that may be harmful to the environment if not properly managed. Tailings and management structures are regulated by the Brazilian Mining Agency (ANM)²⁹ which is responsible for issuing tailings dam safety regulations and overseeing the management of tailings dams³⁰. It also requires mining companies to conduct regular safety inspections, and to have emergency action plans in place in case of a dam failure.

In October 2020 the law 14.066/2020³¹ was sanctioned in response to the Brumadinho dam burst in January 2019. The main aspects of the regulation

include the prohibition of the "upstream" type of dam construction, a method where the dam is expanded with containment dykes rest on the deposited tailings themselves and was the structure used in the two major incidents of dam bursts. It also determines that inspection bodies inform the corresponding protection agency and the emergency response bodies (civil defense) of the inspection actions that verify the need to adopt emergency safety measures in any dam.

Therefore, the dam safety plan must have, among other points, an emergency action plan (PAE), mandatory for all dams with high and medium associated potential damage or high risk, at the discretion of the supervisory body. The preparation of the PAE is also mandatory for all mining tailings dams. The dam safety plan must also identify the existing risks, have a flood map, taking into account the worst possible scenario, and bring the technical data of structures, installations and dam monitoring equipment. The company must keep the dam safety plan updated and operational until the structure is deactivated. This plan must also be included in the National Information System on Dam Safety (SNISB), which is maintained by ANM.

²⁹ Planalto 2017

³⁰ Planalto 1967

³¹ Planalto 2020

The PAE has to be published on the company's website and maintained digitally at the SNISB. Before the start of the first filling of the reservoir, the company responsible for the dam must hold meetings with the communities in order to present the PAE and carry out the preventive measures provided for therein, in joint work with city halls and civil defense agencies. The law also explains that the companies that control dams are obliged, in cases of disaster, to repair damage to human life, the environment and public and private assets, until the structure is completely closed.

The supervisory body may require the non-cumulative presentation of collateral, insurance, surety or other financial or real guarantees to companies controlling dams of mining tailings, industrial or nuclear waste classified as medium and high risk; or water accumulation dams for hydroelectric purposes, classified as high risk.

Additionally, the Brazilian National Environmental Council (CONAMA) is responsible for issuing regulations on the protection of water resources, air and soil, and also the management of hazardous waste³². To comply with regulation as well as obtain a social license to operate with local communities, the companies are investing in technologies to reduce the amount of waste generated and improve the management of existing waste, by employing byproducts as inputs in other economic activities, utilizing drained tailings and wasterock piles as well as deactivating the existing structures with safe closure processes.

Globally, the ICMM (International Council on Mining and Metals), PRI (Principles on Responsible Investing) and UNEP (United Nations Environmental Program) developed and published in 2021 the GISTM – Global Industry Standard on Tailings Management³³, outlining a series of requirements to be complied by ICMM's signatory companies³⁴, many of which operate in Brazil. Complying with this standards presents an opportunity for the companies to enhance their overall controls over the tailings management risks.

Climate Change

The mining industry in Brazil is also impacted by climate change, both as a contributor to greenhouse gas emissions and as a sector exposed to various

climate risks such as extended droughts and excess flooding.

The Brazilian National Policy on Climate Change is the main legislation that regulates the mitigation and adaptation of the mining sector to the climate change effects. The decree 11.075 of 2022³⁵ established a deadline in 2023 for the establishment of sectoral emissions reduction and neutralization plans in Brazil meaning, among others, the mining companies will have to comply to a decarbonization timeline aiming net zero in 2050.

Regarding climate risks, they may be classified as physical risks – with direct or indirect impact on the operations such as floods, draughts and, indirectly, food inflation, infrastructure and disruption caused by extreme weather events, or transition risks – the required change in technology and early retirement of outdated machinery, carbon pricing, legislation and so on.³⁶

On the mitigation part of the equation, the sector is advancing specially in:

- Quantifying and analyzing emissions across the entire value chain, including scope 3 emissions downstream (logistics and steel production)³⁷;
- Developing decarbonization pathways aligned with the Paris Agreement (aiming to limit the global warming to 1.5°C) through partnerships with organizations such as the Science Based Targets initiative (SBTi);
- Incorporating broader ESG considerations, such as biodiversity loss and natural capital, into their transition approach;
- Innovating to scale clean technologies at an accelerated pace to adopt in the mining investment cycle throughout the decade.

Mining will be demanded to be in compliance with European, US and Chinese carbon regulations. As steel operations are energy intensive and the investment cycle is long, decarbonizing and simultaneously scaling operations to meet future demand is critical to broaden transition of the global economy.

³² Planalto 1989

³³ ICMM 2020

³⁴ ICMM s.d

³⁵ Planalto 2022

³⁶ TCFD 2017

³⁷ Considering public emissions record published by Fundação Getúlio Vargas, mining companies registered, like Anglo American, Atlantic Nickel, CSN Mineração, and recently ERO Brasil Caraíba, Kinross and Taboca, present scope 3

The transition to a low carbon economy is also an opportunity to specific mineral assets such as lithium, copper, rare earth and others used in the transition to a low carbon economy³⁷ by enabling the infrastructure and inputs for green energy production, distribution and storage in the near future.

Adaptation is another important aspect, of current climate change strategy in the mining sector. That means investments to be made in mitigating the probability or severity of the adverse impacts in assets. The detailed mapping of future scenarios impacts are crucial for planning and developing the correct responses³⁸.

Water and Biodiversity

Due to the relevant biodiversity in the country and the significance of water resources to the industry, these topics are very sensitive to the mining and metals activities in Brazil.

Water is used throughout the value chain, including in ore processing, in the extraction and excavation phases; in the control of dust, solvents such as coolants and other processes. The impact on water resources is also caused by disruption and contamination of surface and groundwater.

The mining operations, its subjacent infrastructure and social changes in the area (workers migration) may result in acute impacts in the biodiversity such as habitat loss, water contamination, and disruption of animal migration routes can cause ecological damage and affect local communities.

New frameworks on disclosing and managing the impacts on both water and biodiversity (e.g. TNFD³⁹) are being developed as well as specific regulation exists on endemic biodiversity affected by the mineral exploration in caves or greenfields for example.

Land use and environmental regulation in Brazil determine the needs to limits the water consumption⁴⁰ as well as compensating the direct impact on biomass and biodiversity by a set of measures, from financial compensation to maintaining environmental programs and protecting forest areas. Companies are required to perform comprehensive studies on the impacts before filing and obtaining the required environmental licenses and present mitigation and rehabilitation plans for the affected biodiversity⁴¹.

Human Rights

There are still significant human rights challenges, particularly in relation to the rights of local communities and workers⁴². This includes issues such as resettlement, indigenous peoples rights, forced labor and poor working conditions, specially indirectly on suppliers, and others. The Brazilian Constitution⁴³ and the Brazilian Labor Law^{44 45} are the main legislation that regulates human rights⁴⁶ in the mining sector in Brazil and standards such as the UNGP (United Nations Guiding Principles on Business and Human Rights)⁴⁷ are paramount in establishing the adequate policies and planning and executing the appropriate due diligences to comply with the threats⁴⁸. The risks change along the lifecycle of a mining operation and other actions are effective communication channels with local communities and other stakeholders to address their concerns and build trust as well as working with suppliers and contractors to ensure that responsible labor practices are followed throughout the supply chain.

ESG Journey

On the journey towards a more sustainable mining, some challenges include properly organizing and utilizing the ESG data intelligence and extracting value through data quality the sector has after years of relevant environmental assessments and plans, reporting systems and transparency to the various stakeholders, allowing for proper analysis and decisions⁴⁹.

³⁷ BP 2022

³⁸ ICMM 2019

³⁹ TNFD s.d.

⁴⁰ Planalto 1997

⁴¹ Planalto 1981

⁴² ICMM 2022

⁴³ Brazilian Federal Constitution 1988

⁴⁴ Planalto 1943

⁴⁵ Normas Legais 2021

⁴⁶ Planalto 2018

⁴⁷ Business & Human Rights Resource Centre 2023

⁴⁸ ICMM 2012

⁴⁹ Responsible Mining Foundation 2022

After the environmental disasters, IBRAM led an unique initiative, as a response to the society, organizing an event with more than 200 representatives of the sector to discuss the future of mining. It resulted in a Commitment Letter from IBRAM, in which the sector assumed to be committed to a deep transformation in its relationships with people and nature. The document laid the groundwork for the ESG Agenda and the sector's commitments in 12 fields, were turned into working groups with the purpose of discussing industry practices, defining measures and improvement goals, as well as disseminating best practices.

ESG driver	Working Groups		
<p>E</p>	<ul style="list-style-type: none"> <li data-bbox="507 779 1018 846">  Mitigation of environmental impacts <li data-bbox="507 875 655 943">  Water <li data-bbox="507 972 667 1039">  Energy <li data-bbox="507 1068 660 1135">  Waste 		
	<p>S</p>	<ul style="list-style-type: none"> <li data-bbox="507 1234 957 1301">  Health and Occupational safety <li data-bbox="507 1330 852 1397">  Diversity and inclusion <li data-bbox="507 1426 954 1494">  Relationship with communities <li data-bbox="507 1523 900 1603">  Development of territories 	
		<p>G</p>	<ul style="list-style-type: none"> <li data-bbox="507 1693 762 1760">  Process Safety <li data-bbox="507 1789 836 1856">  Dams and Structures <li data-bbox="507 1886 963 1953">  Communication and Reputation <li data-bbox="507 1982 708 2063">  Innovation



10 Taxation

In Brazil, mining activities receive the same tax treatment applied to other economic activities. Mining exploration and exploitation operations are subject essentially to regular federal and state corporate tax regimes.

However, there is also a royalty levied on mining activities on the exploration and the financial return of the exploitation of mineral resources, known as Compensation for Exploitation of Mineral Resources (CFEM), and, in some of the Brazilian States, a state tax levied upon mineral production named as TFRM (Control, monitoring and supervision of research activities, mining, exploration and exploitation of mineral resources fee).

CFEM

The royalty is calculated over the amount of net revenue obtained in the sale of the mineral product. Net revenue results from the sale of the mineral product minus taxes (ICMS, PIS and COFINS) due in the commercialization⁵³.

CFEM is also due when the mineral had been used by the mining companies in their production process instead of being sold. In this context, CFEM calculation basis is: i) the current price of the mineral good, or its similar, in the local, national or international market, or ii) the reference value, defined from the value of the final product the respective beneficiation process.

MINERAL PRODUCT	CFEM RATE (%)
IRON ORE	3.5
BAUXITE, MANGANESE ORE, NIOBIUM AND ROCK SALT	3.0
DIAMOND AND OTHER MINERAL SUBSTANCES	2.0
GOLD	1.5
ROCK, SAND, GRAVEL AND OTHER MINERAL USED IN CIVIL CONSTRUCTION; ORNAMENTARY ROCKS; MINERAL AND THERMAL WATERS	1.0

Table 4: Mineral product rate

⁵³ Law N°. 8.001/1990, Article 2°

TFRM

TFRM is a state tax applicable in Minas Gerais, Pará, Amapá, Mato Grosso, Goiás and Mato Grosso do Sul, which is due when the entity performs research, exploration or exploitation of mineral resources.⁵⁴

The TFRM calculation considers the tonnes of ore mined, on which is applied a fixed BRL amount. These values are set annually by the States' governments. Depending on the State, some mineral production is not subject to TFRM.

Corporate income tax

Corporate income tax is a federal tax charged on the company's book income, adjusted by certain additions (non-deductible expenditures) and exclusions (non-taxable revenues) to reach the taxable income. The rate is 15 percent on taxable income, and a surtax of 10 percent on the net profit exceeding BRL60 thousand per quarter.

The Social Contribution on Profits is also a federal tax charged at 9 percent of taxable income. The tax base tends to be similar to the Corporate Income Tax (IRPJ) tax base, although some specific adjustments may be required in some instances.

Companies can elect two different regimes to calculate the taxable income: actual or presumed profit systems. Note that if the company's net revenue exceeds the limit of BRL 78.000 thousand, the actual profit system is mandatory for the following tax exercise.

Under the actual profit system, net taxable income corresponds to the company's net book profit, adjusted by some inclusions and deductions per Brazilian corporate tax legislation.

Alternatively, the presumed profit is arrived by applying an 8 percent rate over the revenue. The total amount of capital gains, financial revenue and other revenue must be added to this presumed profit base to compute the corporate taxes. The corresponding tax rates are then applied over the presumed profit.

In accordance with the Brazilian tax legislation, under the actual profit system, tax losses can be carried forward indefinitely against the profits of future periods, however the offset is limited to 30 percent of the current year taxable income.

In particular, tax loss carry forwards will be forfeited, if, cumulatively, between the date of the record of the tax loss carry forward and the date of its utilization, the change of the company's control and the change of the company's activity occur.

Tax deduction – mining operations

The Brazilian legislation allows for some expenses related to mining operations to be deducted for income tax purposes, which include:

- **Exploration tax deductions:** The expenses incurred during the exploration stage and when expanding the reserves of the mine may be capitalized and amortized over a minimum period of five years from the start-up date of the mine.
- **Development tax deduction:** The expenses incurred in the mine's development may be capitalized and amortized over a minimum period of five years from the start-up of the mine.
- **Depletion tax deductions:** The amount corresponding to the decline in value of mineral resources deriving from their exploitation may be computed a cost or charge, in each period of assessment.

The exhaustion quota is determined in accordance with the principles applying to asset depreciation, based upon the cost of acquisition or prospecting of mineral resources exploitation. The exhaustion quota calculation takes into consideration the volume of production in the year in relation to the mine's known reserves, having as base on the cost of acquiring or obtaining the restated mining rights or, if the company is not the holder, the duration of the mine's leasing contract.

⁵⁴ Law N°. 19.976/2011 – MG, Law N° 7.591/2011 - PA, Law N° 1.613 - AP, Law N° 4301/2012 - MS, Law N°. 20.942/2020 - GO and Law N°. 11.991/2022 – MT

Transfer Pricing Policy

Until 2022, Brazil did not follow OECD Transfer Pricing Rules. Commodities transactions were evaluated in accordance with specific transfer pricing methods when recognized on an international futures and commodities exchange:

- Quotation price on imports method (PCI) – applies for inbound transactions and is based on the average daily price of goods or rights as recognized on an international futures and commodities exchange, adjusted by the average premium.
- Quotation price on exports method (PCEX) – applies for outbound transactions and is based on the average daily price of goods or rights as recognized on an international futures and commodity exchange, adjusted by average premium.

However, by the end of 2022, the Brazilian government issued a draft legislation to align Brazil's unique transfer pricing system with the OECD Transfer Pricing Guidelines⁵⁵. The new legislation must be approved by the Congress with 120 days to be kept in force.

The biggest change would be the introduction of the arm's length principle which is absent from the current transfer pricing rules. In addition, the changes would include new transfer pricing methods and documentation requirements, and considerable changes to the treatment of intangible assets, financial transactions and business restructuring.

For fiscal year 2023, Brazilian taxpayers can choose between the current transfer pricing rules and the new OECD-based rules, but beginning 1 January 2024, the application of the new OECD-based rules would be mandatory.

The new OECD-based rules would have the following features:



- Any type of financial or commercial transaction would be in scope (whereas the current transfer pricing rules focus on tangible goods, services and rights).
- Commodities play an important role for the Brazilian economy, and it is only natural that they receive a specific treatment. The rigid application of specifically designed methods would be abandoned. Nevertheless, a clear preference for the comparable uncontrolled price (CUP), specific rules regarding the timing of the transactions and the requirement for commodity importer and exporter to register transactional transfer pricing information with the tax authorities would appear to increase complexity in this key area
- The OECD's traditional transaction methods and transactional profit methods would replace the current transfer pricing methods applicable for non-commodities transactions (i.e., transactional net margin method (TNMM) and profit split methods would be available).
- Comparability analysis, functional analysis and benchmarking would become part of the toolbox and would replace the current legally stipulated mark-ups and margins.
- Transactions involving intangibles as well as financial transactions would become transfer pricings topics, instead of being treated from a pure tax deductibility perspective).
- Business restructuring would be in the sphere of transfer pricing rules.
- More types of transfer pricing adjustments would become available (e.g., "compensatory" or "year-end" adjustments commonly associated with the transactional profit methods).
- Rulings, advance pricing agreements (APAs) and mutual agreement procedure (MAP) would become available.

⁵⁵ Provisional Measure N° 1152/2022

Tax incentive – exploration profit

Aiming to accelerate economic growth in underdeveloped areas, principally in Brazil's North and Northeast, the Federal Government implemented an incentive under which taxpayers, including mining companies, can receive either partial or complete tax exemption on income taxes.

The tax exemption applies only to income from facilities operating in the designated regions and the benefits are available to companies that have setup, modernization, extension and diversification projects in these regions.

Eligibility for these incentives depends on Federal Government approval of an industrial project or the expansion of an existing industry.

PIS and COFINS

PIS/COFINS is collected under a cumulative and a non-cumulative regime (debt-credit system, similar but not identical to a value-added tax). Usually, opting between these regimes is locked with the choice with the assessment regime for Income tax.

PIS/COFINS is assessed under a combined rate of 9.25 percent (non-cumulative) and 3.65 percent (for cumulative regime) or non-cumulative regime, the combined rate of 9.25 percent can be used to calculate credits over the acquisition of some goods and services as well as rent.

Export revenues are exempt from the PIS and COFINS.

ICMS (State VAT)

The ICMS is a state tax levied on the circulation of goods, inter-municipality and interstate transport and communications services. The payable amount on each operation must be stated on the corresponding outgoing invoice.

The ICMS taxpayer is entitled to deduct the amounts levied on prior transactions with the same goods or on the acquisition of raw materials, intermediary material and packaging used by the establishment for manufacturing the taxed products from the amount payable (non-cumulative regime).

ICMS is due on the dispatch of goods sent to entities within the state at the rate of 17 percent or 30 percent, depending on the state and on the good.

Similar to PIS and COFINS, export revenues are exempt from ICMS.

IPI (Tax on industrialized products)

IPI is a non-cumulative federal tax levied on the import and manufacture of goods. In general terms, IPI does not apply to mining activities.

Additional tax incentives

In Brazil, wide ranges of government incentives are provided. Usually, incentives take the form of subsidized loan financing and of tax exemptions or reductions, rather than cash grants (mainly State tax – ICMS – incentives – the so-called State Tax War). The concessions are presented to encourage economic development in Brazil, either on a regional or industry basis, by offering taxpayers the opportunity to invest part of their tax liability and by granting fiscal incentives for approved investments.

Current scenario on Tax Reform

Brazilian Tax Reform discussions will continue to progress in the legislative space in 2023 and following fiscal years. The current bill proposals are poised to introduce many significant changes which may impact business operations in the mining sector.

Significant tax topics and proposed changes that may be implemented includes, among other matters: i) reform of the indirect tax system, ii) introduction of dividends taxation and iii) changes in the corporate income tax rules (tax rates, use of tax losses, non-deduction of Interest on net Equity – INE, etc).

Brazilian Trade & Customs Tax Environment

In order to import into or export from Brazil, a company is required to obtain a permit from the Internal Revenue Services called "RADAR" ("Register and Supervision of Foreign Trade"). The RADAR allows the company to carry out import and export activities and to have access to the Global Trade Single Window / Siscomex government trade systems. All import/export transactions are recorded and declared to the tax authorities through those systems.

Accessing the Single Window or Siscomex, the importer and the exporter are able to apply for the import license and for the export record with the Foreign Trade Secretariat (Secex) and other related agencies, as well as, to start the customs clearance process.

As previously mentioned, the Imports into Brazil are subject to five different federal taxes (I) Import Duty; (II) IPI; (III) PIS-Import; (IV) Cofins-Import; (V) Merchant Marine Fee; and one State tax; ICMS. In relation to exports, as general rule, those operations are not taxed in Brazil, except for the external remittance of some controlled products.

The main customs and global trade issues in Brazil are:

- **Tariff Classification:** the accurate tariff classification of imported goods is a basic element of the Brazilian Customs control doctrine. For the purpose of determining the classification of any product imported/exported in Brazil, it is necessary to consider the appropriate tariff heading of the subject merchandise under the Mercosur Harmonized Tariff Schedule ("NCM");
- **Customs Valuation:** Brazil follows the WTO Agreement on Customs Valuation and, thus, when using the transaction value method of appraisal, some costs, if excluded from the cost base, shall be added to the price for valuation purposes, such as royalties and patent rights, among others. Currently, there are six different methods for determining the customs value of imported products into Brazil.
- **Authorized Economic Operator (AEO) Program:** the Brazilian AEO certifies international trade stakeholders which present low operational risks, concerning both cargo physical security and tax and customs compliance. Those certified as AEOs are able to benefit from several operational preferences, including being able to use the AEO seal, which states the company's reliability before clients and authorities.

Main Special Custom Regimes

- **Recof-Sped:** special customs regime that allows the qualified company to import or acquire goods in the local market to be subject to the manufacturing of exported products, with suspension of the payment of the taxes on the acquisition, which is converted to tax exemption after the proof of export. In case of selling the final product in the local market (instead of exporting), the suspended taxes must be collect, but without fines or interests.
- **Drawback:** similar to Recof-Sped, the Drawback regime also allows importing or acquiring goods in the local market to be subject to the manufacturing of exported products, with suspension of the payment of the taxes on the acquisition, which is converted to tax exemption after the proof of export. On the other hand, in case of selling the final product in the local market (instead of exporting), the suspended taxes must be collect with fine and interests.
- **Ex-Tarifário:** Ex-tarifário is a temporary reduction of the Import Duty tax rate to a percentage of 0% or 2%, depending on the case, for capital or telecommunication goods where there is no similar item produced in Brazil.
- **Recordkeeping:** Records are required to be kept by companies in Brazil that are conducting international business. Brazil Customs has a recordkeeping requirement of retention of five years from the date of import. Brazil also has an export file retention period requirement of five years from the date of export.





11 Power supply^{56,57}

Brazil is the biggest electricity market in South America. Of the total 1,231 TWh generated during 2021 in the region, Brazil alone accounted for 663 TWh, or 53 percent of the entire region's electricity generation.[3]

The total installed capacity of the country was 181 GW at the end of 2021, and is expected to have a steady increase in the short or medium term to meet the growing demand. As per the Electricity in the 2031 Brazilian Energy Plan (PDE 2031) the government estimates that a total installed capacity of 275 GW will be required by the end of 2031, growing at an annual rate of 3.9 percent, to keep up with the rise in demand. During that period, the total consumption of electricity is also expected to go up from 563 TWh to 792 TWh.

The industrial sector will continue to be the largest consumer of energy in the country, with a volume of consumption in the order of 3 percent of the total generated energy. However, the rate of growth in industry consumption should be lower than the average, with around 3.2%, due to the improvement of the sector's efficiency and infrastructure utilization. Consumption by source has shown a reduction in the share of petroleum derivatives, sugarcane derivatives and firewood and charcoal over the ten-year period. Sources such as natural gas and electricity may increase its importance. In the case of industrial segments linked to infrastructure, such as non-ferrous metals and others in metallurgy (which includes aluminum), cement and ceramics, the perspective is that their activities will grow more quickly in the first five years.

Brazil's generation capacity mix is largely dominated by hydropower, which accounted for nearly 57 percent of its total at the end of 2021. The next big contributor to the installed capacity is wind, with a share of 11.4 percent.

Natural gas (8.9 percent) Biomass (8.6 percent), oil (4.2 percent), small hydro (3.0 percent), solar (2.6 percent), coal (1.8 percent), and nuclear (1.1 percent) are the other major sources of generation. . But the protagonism of hydros is going to decrease gradually in the next decade since the country is changing its power mix. In addition of the increasing participation of wind, solar, biomass, natural gas sources that we have seen for the last decade, there is a very good expectation for the new renewables technologies such as offshore wind and hydrogen, as Brazil has an important potential to explore them.

Brazil is one of the frontrunners in meeting the carbon-emission reduction targets. It has laid great emphasis on promoting the exploitation of renewable energy potential in the country. In 2021, the country generated 85 percent of its total electricity from renewable sources. In addition to having vast hydroelectricity potential, Brazil also had an estimated 20 GW in wind power potential in 2021 with 30.8 GW forecast by 2031. It is expected that solar will follow the same way, reaching at least 45.3 GW of installed capacity by 2031.

Brazil is expected to invest nearly US\$19 billion in electricity infrastructure between 2021 and 2031, representing nearly 16 percent of the total expected investment of US\$639 billion in the entire energy sector. Almost 81% of the total invested in electric infrastructure will be destined to generation projects, according to the government's Brazilian Energy Plan (PDE 2031). The remaining percentages, while the rest will be in the field of transmission, which requires huge investment in order to integrate the new and upcoming distributed generation projects to guarantee the reliability of the power system.



12 Infrastructure development

Although the quality of Brazilian infrastructure has been a major barrier to economic expansion in Brazil, in the last years great progress has been made in various infrastructure projects to support economic growth and improve the quality of life for its citizens. Some of the major investments include:

- **Transport:** construction of new highways and upgrading existing ones, as well as expanding the country's rail network.
- **Energy:** expanding the country's energy grid and upgrading existing power plants to support the growth of the renewable energy sector.
- **Communication:** telecommunications infrastructure, including the expansion of broadband Internet access and the deployment of 5G networks.
- **Water and Sanitation:** water and sanitation infrastructure has been a priority in Brazil, with private and public sector investment in the expansion of the country's sewage treatment systems and the construction of new dams to ensure a reliable water supply.

One of the key reasons behind the poor state of the infrastructure is low public investment. Besides regulatory improvements, allowing an increase in the

investments of the private sector, public investment in infrastructure has remained lower than the country needs. An estimate of National Confederation of Industry (CNI) indicates that only 1.57% of GDP was invested in infrastructure in the 2021, and in 2022 the Ministry of Infrastructure's budget was the lowest percentage of GDP in 11 years of the historical series⁵². The contribution it is not enough to guarantee maintenance of sector projects that already exist, according to experts. As a result, the IMD – International Institute for Management Development Rankings on Basic Infrastructure has placed Brazil at 58th position among 63 countries.

BNDES is the National Bank for Economic and Social Development in Brazil, and it is one of the main sources of financing for infrastructure development in the country. BNDES provides financing for infrastructure projects through loans and investments, and it has invested billions of dollars in recent years. According to reports, BNDES invested around \$30 billion in infrastructure projects in 2019, with a focus on transport, energy, and communication infrastructure. The private sector has also invested significantly in infrastructure projects through public-private partnerships. For example, in

⁵² Exame 2022

2019, the Brazilian government announced plans to invest around \$126 billion in infrastructure projects over the next five years. This includes investments in transport, energy, water and sanitation, and communication infrastructure. However, recent announcements of the President related to changing new regulatory framework related to these sectors, has concerned the market.

As for future projections, figure 7 shows the infrastructure transport agenda, with an expectation of an increase in 45 assets, including privatizations, and concessions.



Figure 7: 2023-2026 Infrastructure Agenda



13 Labor relations and employment situation

Brazilian employment relationship is regulated by the Consolidation of Labor Laws (CLT), the Brazilian Federal Constitution and other ancillary norms. This relationship is also regulated by rules set forth under Collective Bargaining Agreements which are negotiated between employers and unions representing employees, even if they are not unionized. Unions in Brazil have a key role setting forth rights related to employees' benefits, such as annual salary increase and profit sharing.⁵³

Since November 2017, direct negotiations between employers and employees were given the same status of Collective Bargaining Agreements (this type of negotiation is only allowed to employees who hold university degrees and receive a monthly base salary equal to or higher than twice the maximum benefit paid by Social Security).⁵³

The unemployment rate for Q3 2022 stood at 8.7%, as informed by the IBGE (Brazilian Institute of Geography and Statistics). It is the lowest level since 2015, which shows that the Country is returning to the pre-pandemic scenario. However, this drop was accompanied by continued growth of informal employment (self-employed workers without

Legal Entity Register and employees without a formal contract).^{54 55}

Due to the emergence of new technologies and changes in production chains, Brazil continues to face a shortage of skilled labor. According to the National Confederation of Industry (CNI) Map of Industrial Work (2022-2025), in the next three years Brazil must qualify 9.6 million people in industrial occupations. Technological evolution has also led to the growth of technical and Bachelor-level occupations, which reinforces investment by industry and companies in Corporate Education.⁵⁶

The shortage of skilled labor was also intensified by competition for professionals in the international market. Covid-19 has disrupted the flow of international talent. With the growth of remote work opportunities, mining companies have been competing for professionals with companies from different sectors, mainly technology companies looking for highly specialized professionals. Mining companies need to illustrate modern environments and play an integral role in society in order to attract young and specialized professionals.⁵⁷ Furthermore, flexibility and purpose are key for those seeking jobs in the market.

⁵³ International Comparative Legal Guides 2022

⁵⁴ Instituto Brasileiro de Geografia e Estatística 2022

⁵⁵ Folha de São Paulo 2022

⁵⁶ Portal da Indústria 2022

Both ESG and technology are currently impacting jobs in the sector. Overall pressure for ESG to become a priority with major players selling some of their assets, investing not only on social initiatives, but also more awareness and consideration of environmental impacts now and for future generations. Business decisions no longer aim to prioritize the safety of people but to also think of the environment, integrity and social legacy. As for the workforce, non-technical capabilities, soft skills and decision-making capabilities become even more important since routine and tasks-based jobs have become more automatized. An employer who is ESG conscious and prioritizes the environmental and social agendas will be more appealing to the workforce as it fits their purpose in life.

When considering talents, roles within the industry are perceived as dangerous and/or part of the global warming crisis. Therefore, some migrate to other industries which appear to be 'cleaner'. The cost to compete for talent in the open market tends to be higher than the cost of developing skills internally. The stereotype of being bad for the environment is a reason mining is less attractive for younger workforce population. With shortage of talent still an issue, companies are working on developing core and soft skills, investing on training to overcome this problem over time.

The mining sector is one of the most male-dominated industries in the world, as is the case in Brazil, where male workers represent 88% of the workforce. Most female professionals working in the sector are still in administrative and support positions, with low representation in technical and operational positions. On the other hand, the female population has a higher proportion of advanced educational level than the male population. This is a favorable indicator for the tendency to reduce the gender pay gap and to increase the female population in higher qualification positions.⁵⁷ Workforce today is impatient demanding workers to accept individual differences and embrace culture differences, committing to transformation and to foster diversity and inclusion within the organization.

Recent tragedies demanded and forced transformation to happen. With negative media attention, companies have efforts underway to bring back dignity for affect communities and to focus more in the social dimensions, learning from errors from the past.

⁵⁷ bnamericas 2022

⁵⁸ Intergovernmental Forum of Mining 2022



14 Inbound and outbound investment

Foreign direct investment (FDI) has faced an increase around 8% from 2014 to 2017 in Brazil, peaking at US\$67,5 billion in 2017. Post 2017, the scale of FDI has dropped as it attracted US\$59,8, 65,38, 28,3 and 50,6 billion during 2018, 2019, 2020 and 2021, respectively. According to the Brazilian Central Bank, the total FDI in Brazil is expected to reach US\$85,1 in 2022. The percentage contribution of FDI towards the GDP of Brazil has been around 3 percent in recent years and is expected to reach contributions around for 4% in the short-term.

The country's inward direct investments have been outpacing its foreign outward investment, as shown in Figure 8.

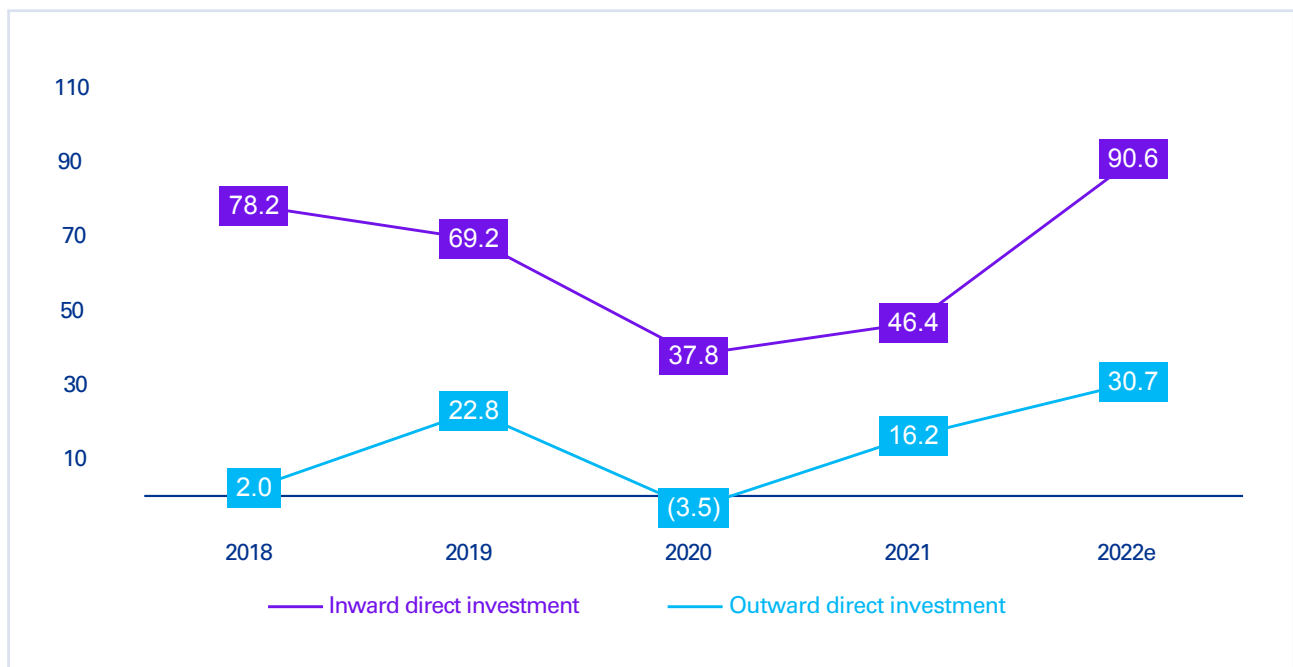


Figure 8: Inward and outward direct investments
Source: Banco Central

⁵⁹ Banco Central 2023

⁶⁰ IBRAM 2022

According to the previous Minister of Mines and Energy, mining can significantly help Brazil to attract foreign capital in large volumes in the coming years and double the sector's share in GDP, from 2.4% to 5%. The Brazilian mineral sector gained a new financial network, uniting public and private organizations to help improve the mining business environment.⁶⁰

As figure 9 shows, the expectation of mineral sector investments is projected to reach US\$ 50 billions up to 2027.

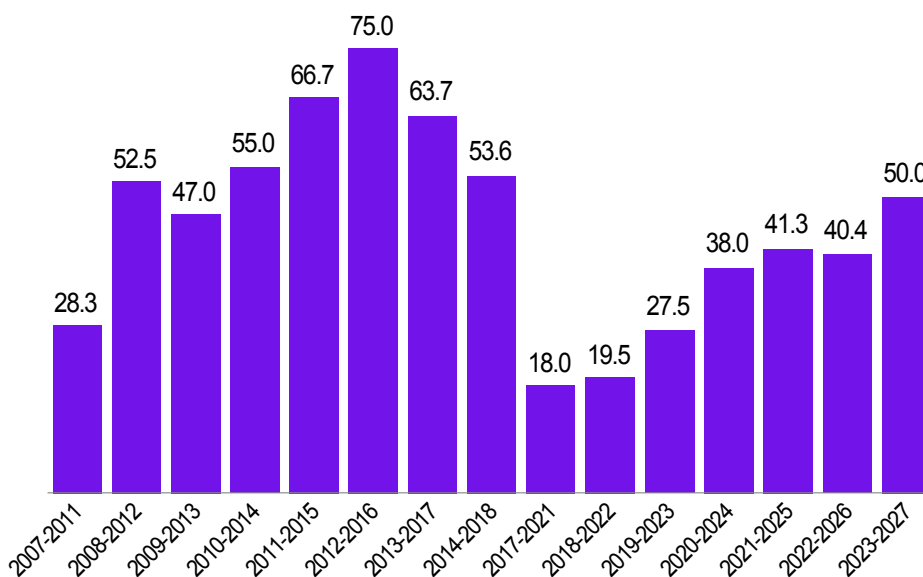


Figure 9: Mineral sector investment estimates in US\$ billions
Source: IBRAM

MAIN INVESTMENTS ESTIMATES BREAKDOWN	2023-2027
Copper	4.474,30
Iron ore	16.921,90
Zinc	113,00
Bauxite	4.962,00
fertilizers	5.222,00
Gold	2.847,00
Nickel	2.338,00
Manganese	225,00
Other substances	1.933,00
Logistics	4.448,12
Socioenvironmental	6.559,00
TOTAL	50.043,33

Table 4: Main investments estimates breakdown in US\$ billions
Source: IBRAM

15 Key commodities

Production and reserves⁶¹⁶²

Brazil is a leading producer of minerals – producing and marketing nearly 70 mineral commodities. The mining industry in Brazil not only contributes a significant part to the country’s annual gross domestic product (GDP), but is also responsible for the country’s consistent trade surplus. Brazil is the

world’s largest producer of niobium and second largest of iron ore. Further, it is the third largest producer of bauxite and fifth largest producer of tin. In addition, Brazil is an importer of mineral coal, potash, copper, zinc, sulfur, etc.

ORES	PRODUCTION ON 2021 (1,000)	PRODUCTION ON 2021 (1,000)	CHANGE (%)
AGGREGATES	321,698	849,000	26
IRON	273,330	820,000	122
BAUXITE	16,225	38,000	23
MANGANESE	597	3,000	15
PHOSPHATE	3,234	2,500	39
COPPER	335	600	50
NICKEL	75	100	43
ZINC	159	350	23
NIOBIUM	112	120	33%
GOLD	0.081	0.095	44

Table 5: Expected production
Source: ANM

MINERAL	%BRA VS. WORLD PRODUCTION	RANKING POSITION	%BRAZIL VS. WORLD RESERVES	RANKING POSITION
BAUXITE	8.2%	3rd	8.4%	4th
COPPER	1.6%	14th	1.3%	13th
GOLD	2.6%	13th	4.4%	6th
IRON ORE	15%	2nd	17.6%	3th
KAOLIN	2.7%	9th	23%	2nd
MANGANESE	2%	9nd	18%	3th
NIOBIUM	88%	1st	94.1%	1st
TANTALITE	22.3%	2nd	42.5%	2st
TIN	7.3%	5th	8.5%	5rd
ZINC	1.25%	12th	1.2%	6th

Table 6: Classification of Brazil’s mineral production and reserves compared with the world’s total
Source: Mineral Commodity Summaries 2022 - US Geological Survey

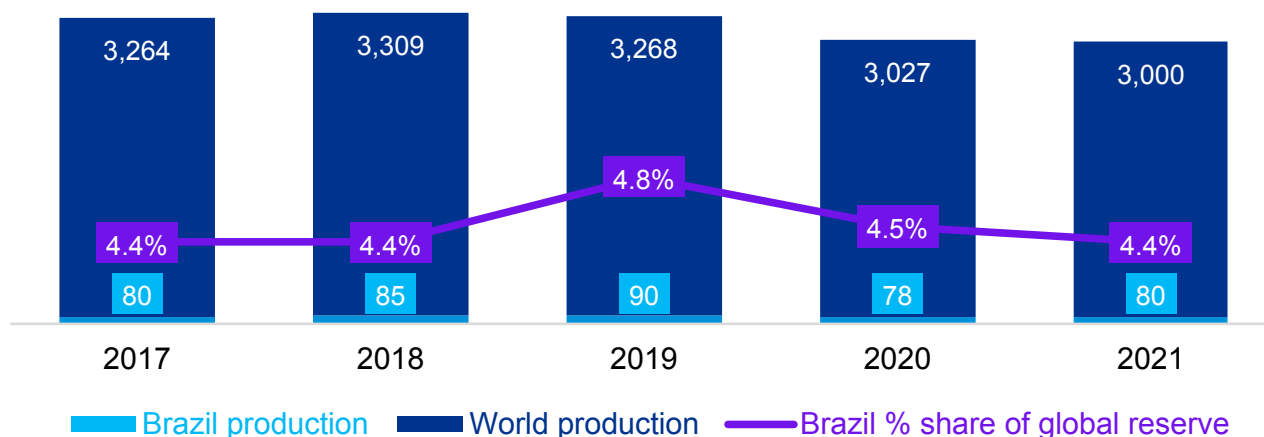
⁶¹ USGS 2022

⁶² ANM 2023

EXPORTER (GLOBAL PLAYER)	EXPORTER	SELF-SUFFICIENT	IMPORTER/ PRODUCER	EXTERNAL DEPENDENCY
Niobium (1st)	Nickel	Limestone	Copper	Metallurgical Coal
Iron ore (2nd)	Magnesite	Industrial Diamond	Diatomite	Sulphur
Manganese (2nd)	Kaolin	Talc	Phosphate	Potassium
Tantalite (2nd)	Tin	Titanium	Zinc	Rare Earths
Graphite (3rd)	Vermiculite	Tungsten		
Bauxite (2nd)	Chromium			
Ornamental rocks (4th)	Gold			

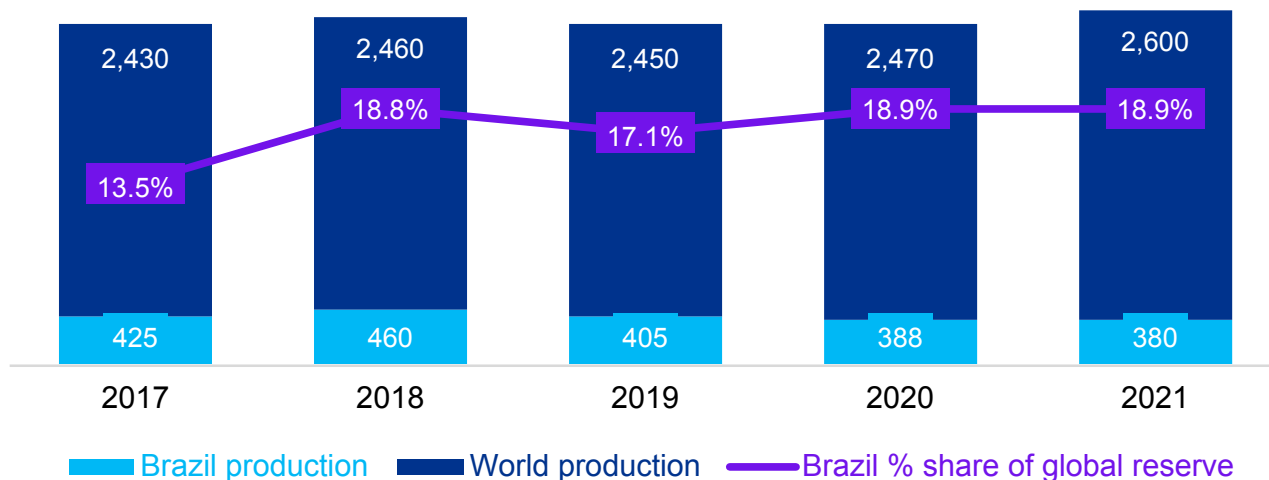
Table 7: Mineral production: Global position of Brazil
Source: IBRAM

Gold production (in tons)



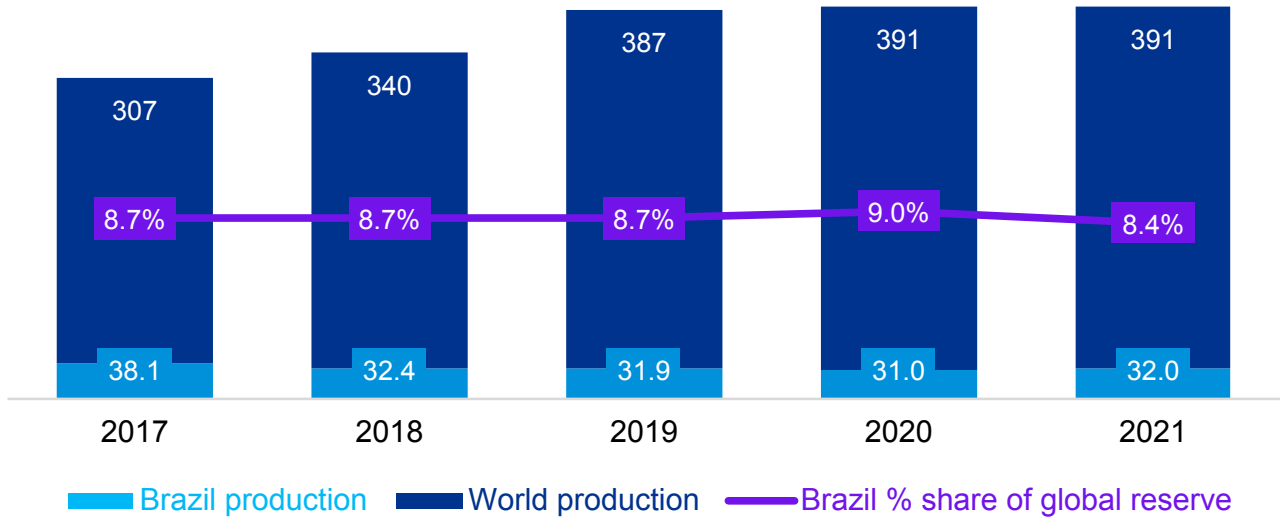
Source: USGS

Iron Ore production (in million tons)



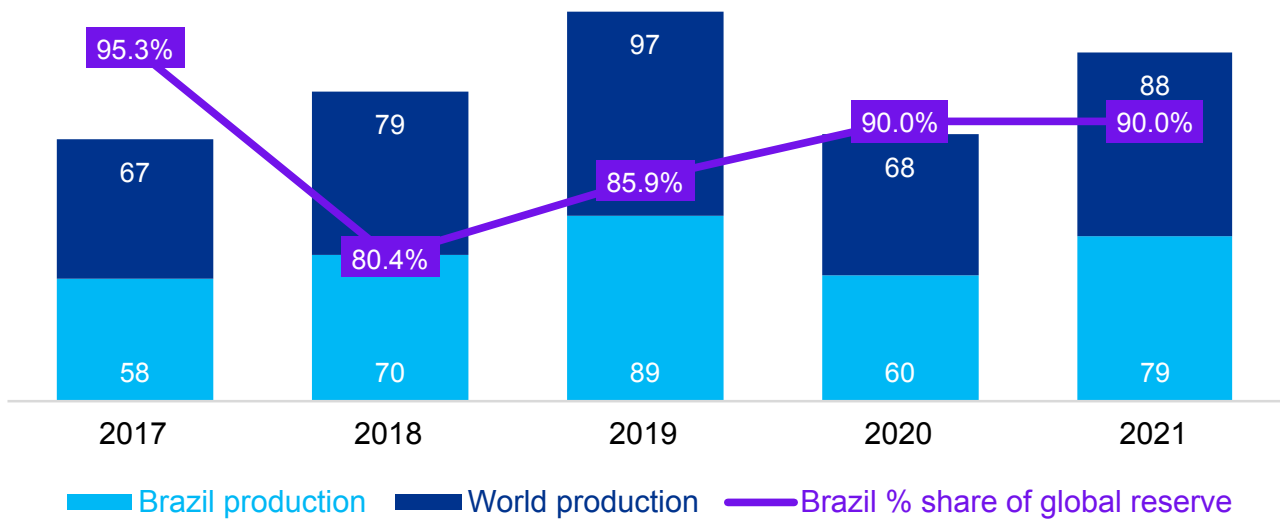
Source: USGS
Note*: Usable Ore

Bauxite production (in million tons)



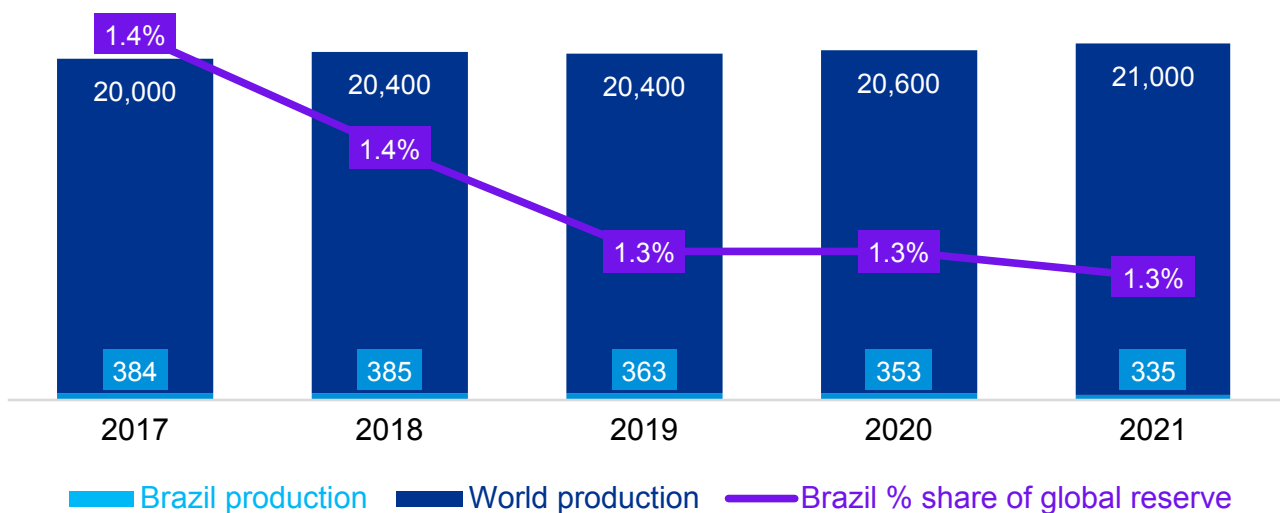
Source: USGS

Niobium production (in thousand tons)



Source: USGS

Copper production (in thousand tons)



Source: USGS

Brazil's share of key commodities in global reserves

Given its diverse geological environment, Brazil is considered to have one of the largest mineral potential in the world. Brazil has significant reserves of several important commodities such as gold (2,400 metric tons), iron ore (34,000 million metric tons), nickel (16 million metric tons) and potash (2,300 thousand metric tons). Minas Gerais, Para, and Goias are the most mineral-rich states in Brazil. The country holds the largest reserves in the world of niobium, followed by Canada.

Table 8, below provides the reserve level of key commodities in Brazil and the country's share in the global reserve level, at the end of 2021.



MINERAL	BRAZIL RESERVE LEVEL	GLOBAL RESERVE LEVEL	SHARE OF BRAZIL IN GLOBAL RESERVE
GOLD (METRICTONS)	2,400	54,000	4.44%
IRON ORE - CRUDE (THOUSAND METRIC TONS)	34,000	180,000	18.89%
NICKEL (METRICTONS)	16,000,000	95,000,000	16.84%
POTASH (THOUSAND METRICTONS)	2,300	3,500,000	0.07%
NIObIUM (METRICTONS)	16,000,000	17,000,000	94.12%
RARE EARTHS (METRICTONS)	21,000,000	120,000,000	17.50%
COPPER* (THOUSAND METRICTONS)	11,212	800,000	1.40%

Table 8: Reserve level of key commodities in Brazil, end of 2021

Note*: Data from 2018

Source: USGS

16

IBRAM Associated Mining Companies

- 1..... 3A MINING S.A.
- 2.....ALCAN ALUMINA LTDA
- 3..... ALCOA WORLD ALUMINA BRASIL LTDA
- 4..... AMG BRASIL S/A
- 5..... ANGLO AMERICAN MINERIO DE FERRO BRASIL S/A
- 6..... ANGLOGOLD ASHANTI CORREGO DO SITIO MINERACAO S/A
- 7.....APPIAN CAPITAL BRAZIL - ATLANTIC NICKEL MINERACAO LTDA
- 8..... ARAGUAIA NIQUEL METAIS LTDA
- 9..... BRASIL S/A
- 10..... AURA MINERAIS PARTICIPACOES LTDA.
- 11..... AVG EMPREENDIMENTOS MINERARIOS S/A
- 12.....BAHIA MINERACAO S/A
- 13..... BAUMINAS MINERACAO LTDA
- 14..... BEMISA HOLDING S.A.
- 15..... BHP BILLITON BRASIL LTDA
- 16..... BRAZAURO RECURSOS MINERAIS S.A.
- 17..... CIA DE FERRO LIGAS DA BAHIA FERBASA
- 18..... CMOC BRASIL MINERACAO INDUSTRIA E PARTICIPACOES LTDA
- 19..... COMPANHIA BRASILEIRA DE ALUMINIO
- 20.....COMPANHIA BRASILEIRA DE LITIO
- 21.....COMPANHIA BRASILEIRA DE METALURGIA E MINERACAO - CBMM
- 22..... COMPANHIA MINERADORA DO PIROCLORO DE ARAXA - COMIPA
- 23..... COPELMI MINERACAO LTDA
- 24..... EMBU S A ENGENHARIA E COMERCIO
- 25..... FIDES MINING MINERADORA S/A
- 26..... GERDAU ACOMINAS S/A

- 27**..... GSM MINERACAO LTDA
- 28**.....IAMGOLD BRASIL PROSPECCAO MINERAL LTDA
- 29**.....IMERYS RIO CAPIM CAULIM S/A
- 30**..... KINROSS BRASIL MINERACAO S/A
- 31**..... LARGO VANADIO DE MARACAS S.A
- 32**.....LUNDIN MINING CORPORATION
- 33**.....MAGNESITA MINERACAO S/A
- 34**..... MINERACAO AURIZONA S/A
- 35**.....MINERACAO BELOCAL LTDA
- 36**..... MINERACAO BRASILEIRA REUNIDAS S/A - MBR
- 37**..... MINERACAO CARAIBA S/A
- 38**..... MINERACAO JUNDU LTDA
- 39**..... MINERACAO MOEMA LTDA
- 40**..... MINERACAO MORRO DO IPE S/A
- 41**..... MINERACAO MORRO VERDE LTDA
- 42**.....MINERACAO RIO DO NORTE S/A
- 43**..... MINERACAO SERRAS DO OESTE EIRELI
- 44**..... MINERACAOTABOCA S/A
- 45**..... MINERACAO USIMINAS S/A
- 46**..... MINERAL DO BRASIL LTDA
- 47**.....MINERITA MINERIOS ITAUNA LTDA
- 48**..... MOSAIC FERTILIZANTES P&K LTDA
- 49**..... NACIONAL DE GRAFITE LTDA
- 50**..... NEXA RECURSOS MINERAIS S/A
- 51**.....PEDRAS CONGONHAS EXTRACAO ARTE INDUSTRIA LTDA
- 52**.....SAFM MINERACAO LTDA
- 53**.....SALITRE FERTILIZANTES LTDA.
- 54**..... SAMARCO MINERACAO S/A
- 55**..... SERABI MINERACAO S/A
- 56**..... SERRA VERDE PESQUISA E MINERACAO LTDA

IBRAM Associated Mining Companies

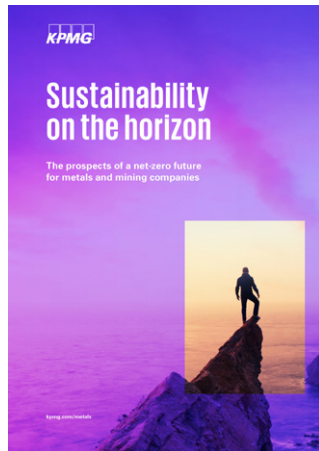
- 57**..... SIGMA MINERACAO S.A.
- 58**..... SOCIEDADE EXTRATIVA DOLOMIA LIMITADA
- 59**..... SOMAR - SOCIEDADE MINERADORA LTDA
- 60**..... SUL AMERICANA DE METAIS S/A
- 61**..... TAQUARIL MINERACAO S/A
- 62**..... VALE S/A
- 63**..... VALLOUREC MINERACAO LTDA
- 64**..... VOTORANTIM CIMENTOS S/A
- 65**..... YAMANA DESENVOLVIMENTO MINERAL S/A
- 66**..... YARA BRASIL FERTILIZANTES S/A



KPMG Global Mining practice

The mining industry faces a host of challenges, particularly regulatory changes and geopolitical risks. Stakeholders are calling for environmental and social concerns to be treated as top priorities. To address these challenges, mining and exploration companies need to be agile and flexible. KPMG professionals have worked with companies across the mining life cycles, from exploration and evaluation through to closure. Our specialists can help you to reduce costs, integrate digital tools and technologies, manage your asset portfolio and assess risks including those posed by climate change. We can help you to create a strategy for climate risk and decarbonization. KPMG firms work side by side with mining organizations to help them meet both the practical, day-to-day challenges of their business, as well as develop long-term strategies for growth.

Further insight from KPMG



For more information, visit <https://kpmg.com/xx/en/home/industries/mining.html>

References

- Agencia Brasil. (2023). Retrieved January 2023, from <https://agenciabrasil.ebc.com.br/economia/noticia/2023-01/haddad%3A%20diz-que-congresso-deve-voltar-abracar-reforma-tributaria>
- ANM. (2023, Jan 26). Retrieved Feb 03, 2023, from <https://app.powerbi.com/view?r=eyJrjoiZTRkNjI3MWEtMGI3My00ZTgzLWlyN2YtMzNjNDhjNTViM2Q2liwidCI6ImEzMDgzZTlxLTc0OWItNDUzNC05YWZhLTU0Y2MzMTg4OTdiOCJ9&pageName=ReportSection99c5eaca1c0e9e21725a>
- B3. (2023, Feb 02). Retrieved Feb 02, 2023, from https://www.b3.com.br/pt_br/produtos-e-servicos/negociacao/renda-variavel/empresas-listadas.htm
- Banco Central. (2023, January). Retrieved from <https://www.bcb.gov.br/estabilidade/financeira/historicocotacoes>
- Banco Central. (2023). Retrieved Jan 31, 2023, from <https://www.bcb.gov.br/estatisticas/historicosetorexterno>
- Banco Central do Brasil. (2022). Retrieved Jan 31, 2023, from <https://www3.bcb.gov.br/sgspub/consultarvalores/consultarValoresSeries.do?method=consultarValores>
- Banco Central do Brasil. (2023, Jan 26). Retrieved Jan 31, 2023, from https://www.bcb.gov.br/content/statistics/externalsectorstatistics_prev/202301_External_sector_statistics_text.pdf
- bnamericas. (2022, May 30). bnamericas. Retrieved Jan 26, 2023, from <https://www.bnamericas.com/en/interviews/the-top-challenges-facing-south-america-miners>
- BP. (2022). Retrieved Feb 02, 2023, from <https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2022-full-report.pdf>
- Brazilian Federal Constitution. (1988). Retrieved Jan 26, 2023, from http://www.planalto.gov.br/ccivil_03/constituicao/constituicao67.htm
- Business & Human Rights Resource Centre. (2023, Feb 02). Retrieved Feb 02, 2023, from <https://www.business-humanrights.org/pt/temas-relevantes/un-guiding-principles-on-business-human-rights/>
- EIU. (2022, April 20). Retrieved Jan 26, 2023, from <https://country.eiu.com/brazil>
- Engineering & Mining Journal. (2011, Feb 10). Brazil - Not a Country for Beginners.
- EPE. (2022, Aug). Retrieved Feb 1, 2023, from <https://www.epe.gov.br/pt/publicacoes-dados-abertos/publicacoes/anoario-estatistico-de-energia-eletrica>
- EPE. (2022). Retrieved Feb 01, 2023, from <https://www.epe.gov.br/pt/publicacoes-dados-abertos/publicacoes/plano-decenal-de-expansao-de-energia-2031>
- Fraser Institute. (2022, Apr 12). Retrieved Jan 26, 2023, from <https://www.fraserinstitute.org/categories/mining>
- Fraser Institute. (2022, Sep 8). Retrieved Jan 1, 2023, from <https://www.fraserinstitute.org/studies/economic-freedom-of-the-world-2022-annual-report>
- Fundação Getúlio Vargas. (2021). Registro Público de Emissões. Retrieved January 2023, from <https://registropublicodeemissoes.fgv.br/participantes>
- G1. (2023, Jan 16). Retrieved Jan 26, 2023, from <https://g1.globo.com/economia/noticia/2023/01/16/haddad-diz-que-se-depender-do-governo-reforma-tributaria-sera-votada-no-1o-semester.ghtml>
- IBGE. (2022). Retrieved Jan 27, 2023, from <https://www.ibge.gov.br/estatisticas/economicas/contas-nacionais/9300-contas-nacionais-trimestrais.html?edicao=33060&t=resultados>
- IBGE. (2022). Retrieved Feb 02, 2023, from <https://www.ibge.gov.br/explica/desemprego.php>
- IBGE. (2023, Jan 27). Retrieved Jan 27, 2023, from <https://www.ibge.gov.br/apps/populacao/projecao/index.html>
- IBGE. (2023). Retrieved Jan 31, 2023, from <https://www.ibge.gov.br/estatisticas/economicas/precos-e-custos/9256-indice-nacional-de-precos-ao-consumidor-amplo.html?=&t=series-historicas>
- IBRAM. (2019). An Update of the Brazilian Environmental Laws. Brasília: IBRAM.
- IBRAM. (2022, Nov 29). Retrieved Feb 03, 2023, from <https://ibram.org.br/noticia/mineracao-podera-atrair-investimentos-expressivos-para-o-brasil-diz-ministro-sachsida/>
- ICMM. (n.d.). Retrieved Feb 02, 2023, from <https://www.icmm.com/en-gb/our-story/our-members>
- ICMM. (2012, Apr 18). Retrieved Feb 02, 2023, from <https://www.icmm.com/en-gb/guidance/social-performance/2012/human-rights-due-diligence>
- ICMM. (2019, Nov 18). Retrieved Feb 02, 2023, from <https://www.icmm.com/en-gb/guidance/environmental-stewardship/2019/adapting-to-a-changing-climate>
- ICMM. (2020, Aug 05). Retrieved Feb 02, 2023, from <https://www.icmm.com/en-gb/our-principles/tailings/global-industry-standard-on-tailings-management>
- ICMM. (2022, Jun). Retrieved Feb 02, 2023, from <https://www.icmm.com/en-gb/our-principles/mining-principles/principle-3>

Contact us

Mining Leadership contacts

Trevor Hart KPMG International
Global Head of Mining
E: thart@kpmg.com.au

KPMG in Brazil contacts

Manuel Fernandes
Energy and Natural Resources
Latin America Leader
E: mfernandes@kpmg.com.br

Anderson Dutra
Energy and Natural Resources
Brazil Leader
E: adutra@kpmg.com.br

Ricardo Marques
Metals and Mining Brazil Segment Leader
E: rmmarques@kpmg.com.br

Paulo Guilherme Coimbra
Infrastructure and Energy and Natural
Resource DA&S Leader
E: pgcoimbra@kpmg.com.br

Lúcia Rabelo
Infrastructure and Energy and Natural
Resource DA&S Senior Manager
E: luciarabelo@kpmg.com.br

Other Contacts

Daniel Ricica
2º Partner KPMG Canada
E: dricica@kpmg.ca

kpmg.com.br



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