



KPMG GLOBAL MINING INSTITUTE

BRAZIL


Country Mining Guide

2015

KPMG INTERNATIONAL

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01 Executive summary

Brazil is one of the leading mineral producing countries – the world's largest producer of niobium, second largest producer of iron ore and manganese and among the largest producers of bauxite and tin. The country produces nearly 80 mineral commodities; however, iron ore is the mainstay of the Brazilian mineral market as it accounts for nearly 80 percent of the country's minerals export.

In Brazil, 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 National Department of Mineral Production (DNPM) grants mineral exploration licenses in Brazil. The Ministry of Mines and Energy (MME) issues development concessions. The Geological Survey of Brazil (CPRM) is the national agency responsible for collecting information on the country's geology, minerals and water resources. However, the government is planning to introduce a new mining code to revamp the sector. The proposed code plans to dissolve DNPM and create a regulatory agency – National Mining Agency – that will have the authority to regulate, supervise, and organize public bidding for the concession of new mineral rights.

The ongoing slowdown in the world economy has affected the demand for various minerals, which has had severe effects on Brazilian' mining sector. It is likely to result in lower investment in the mining sector in the years ahead.

Investment on the infrastructure front, however, is expected to grow steadily in the near future. Acknowledging the poor state of infrastructure as one of the key barriers in Brazil's growth, the government has laid out extensive plans to revamp the existing facilities and add new ones in energy, transportation, housing, water and sanitation. The government has opted for private participation in infrastructure related projects in order to attract the required funds. Privatization began with roads and airports and will cover railways and ports as well in the next years.

The Brazilian government has stringent regulations to cut greenhouse gas (GHG) emissions. In some regions, the legislations are at both state and municipal level. In 2012, Brazil announced plans to cut GHG emissions in the mining sector by 4 percent compared to emission levels in 2005 by 2020. Overall, Brazil is expected to meet its target of reduction between 36.1 to 38.9 percent, from 2005 levels, of projected Green House Gas (GHG) emissions by 2020.

BRAZIL



Brazil produces

NEARLY

80

MINERAL
COMMODITIES



Brazil is the world's
LARGEST
PRODUCER OF NIOBIUM



2ND

LARGEST PRODUCER OF
IRON ORE AND MANGANESE
AND AMONG THE LARGEST
PRODUCERS OF BAUXITE
AND TIN



02 Country snapshot

Brazil^{1,2}

Geography

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.

- Located in the eastern part of South America (10°00 S, 55°00 W) and spread over 8,515,770 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.³

Population

With an estimated population of 202.77 million (July 2014 estimates⁴), Brazil is the sixth most populated country in the world. The country's population is relatively young, with a median age of 30.7 years.

Currency

In the 1980s and early 1990s, Brazil made a number of changes in currency amid hyperinflation and macro-economic volatility. However, the current currency system has been stable since its introduction and associated economic reforms in mid-1990s.⁵

Average exchange rate in Q3 2015 was:⁶

- BRL3.55: US\$1

Sources: CIA Factbook and Economic Intelligence Unit (EIU)



¹ CIA: The World Factbook, Accessed on May 18, 2015

² Brazil Country Profile, EIU, Accessed on May 18, 2015

³ Agri-food management excellence

Instituto Brasileiro de Geografia e Estatística (IBGE), July 2014 estimates

⁵ Currency and Money in Brazil, Kwinessential, accessed on June 23, 2014

⁶ Economic Intelligence Unit (EIU), Accessed on December 3, 2015

03 EIU rankings: Ease of doing business⁷

Brazil ranked 41st 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 2009-13, which included 12 countries, Brazil ranked third.

Over the forecast period of 2014-18, EIU expects Brazil to hold the same rank (41st) globally. However, in the regional rankings, it is expected to lose one position and slip to the fourth rank. 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 are expected to constrain Brazil's growth.

The President, Dilma Rousseff, took office for a second four-year term in January 2015. EIU expects fiscal and monetary policy tightening to bolster the public finances and lower inflation, with the result of economic decline in 2015. However, following these adjustments, the GDP is expected pick up during the period of 2016-19.

Value of index ^a		Global rank ^b		Regional rank ^c	
2009–13	2014–18	2009–13	2014–18	2009–13	2014–18
6.33	6.58	41	41	3	4

Source: EIU

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.

⁷ Brazil Country Profile, EIU, Accessed on May 18, 2015





04 Type of government and judiciary^{8,9,10}

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 Brasilia). The Chamber of Deputies (the lower house) has 513 directly elected members. The members of the upper house serve eight-year terms, while those in the lower house serve four-year terms.

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.

⁸ CIA: The World Factbook, Accessed on May 19, 2015

⁹ Brazil Country Profile, EIU, Accessed on May 19, 2015

¹⁰ Brazil Politics – Intro, Brazil.org Accessed on May 19, 2015



05 Economy and fiscal policy

Brazil is the world's seventh largest economy according to the latest World Bank data.¹¹ As per the 2014 estimates of Central Intelligence Agency (CIA), the nominal GDP of Brazil was \$2.24 trillion, while in terms of purchasing power parity it stood at \$3.07 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 70.4 percent, 23.8 percent and 5.8 percent, respectively, to the total GDP as per CIA 2014 estimates. Most of the country's industries are located in its southern and southeastern regions.¹²

GDP growth

Brazil was one of the first emerging markets to begin a recovery post the 2008 global financial crisis. In 2010, the Brazilian GDP rebounded strongly and registered a growth of around 7.5 percent, after contracting by 0.6 percent in 2009.¹³

However, the GDP growth rate has been on a decline in the recent years. The GDP growth rate was estimated at 0.3 percent and 2.5 percent for 2014 and 2013, respectively.¹⁴ In 2015, the Brazilian economy is expected to witness a negative growth. Economists estimate a y-o-y contraction of 3.19 percent.¹⁵

¹¹World Bank GDP Data, Accessed on May 19, 2015

¹²CIA: The World Factbook, Accessed on June 23, 2014

¹³CIA: The World Factbook, Accessed on June 23, 2014

¹⁴CIA: The World Factbook, Accessed on May 19, 2015

¹⁵Brazil's 2016 inflation expectations remain steady – survey

Monetary and Fiscal Policy

During 1960–1980, the country faced a series of boom and bust periods and was regularly plagued with problems of high inflation and foreign debt. However, since the monetary and fiscal reforms introduced in 1994, which included measures such as the introduction of the 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.^{16,17}

In recent years, Brazil has been facing high inflation. According to Brazilian Central Bank's survey of nearly 100 analysts, inflation is widely expected to increase to 8.25 percent in 2015.¹⁸ As a result, policy makers continue to tighten monetary measures to curb inflationary factors. In April 2015, the monetary policy committee decided to increase the Selic rate by 50 basis points, taking it to 13.25 percent.¹⁹

On the fiscal policy front too, the focus is on reigning in high inflation, and gradually moving towards high growth through structural adjustments. The government has raised taxes and cut spending to control the widening budget deficits.

Brazil's fiscal balance has been suffering with huge deficits in recent years. In 2014, the country ended with a budget deficit of \$128.5 billion, or 6.7 percent of GDP, according to the Central Bank of Brazil, compared with 3.25 percent deficit in 2013. Budget deficits are primarily driven by higher spending taken up by the government in the past few years in order to boost growth.²⁰ However, after Ms. Rousseff's election victory in October 2014, the government has moved towards budgetary prudence and exercising austerity in public spending.

Foreign Trade

Foreign trade constituted nearly a quarter of Brazil's GDP (CIA estimates) in 2014, with China, the US, and the EU being the largest trading partners.²¹

The total import and export for the year 2014 was US\$225 billion and US\$229, respectively.²²

Brazil has been maintaining a sizeable foreign reserve of US\$381 billion (as on December 31, 2014, CIA estimates) in recent years. Its public debt has increased from 56.7 percent of GDP in 2013 to 59.3 percent of GDP in 2014. However, the current public debt figures are a great improvement over the numbers seen nearly a decade ago. In 2005, the public debt was 67.7 percent of the GDP.

Brazil's external debt increased from US\$482.8 billion on December 31, 2013 to US\$535.4 billion as on December 31, 2014.^{23,24}

Brazil maintained positive trade balance since 2000, until 2014 when it posted a deficit of US\$3.9 billion. The deficit is attributed to a variety of reasons, ranging from slowdown in China that caused a slump in demand for raw material, to the economic downturn in Argentina (the biggest foreign market for Brazilian vehicles). A global glut of sugar and soybean has also further affected the exports from Brazil. However, the trade balance is expected to improve in 2015 with a surplus of nearly US\$10 billion, and witness gradual strengthening thereon.^{25,26}

Economic Statistics

- Income level – Upper middle income
- GDP (current US\$) – \$2.244 trillion (2014 estimates)²⁷
- Population (total) – 202.77 million (July 2014 estimates) 2013²⁸

Brazil's economy has been under pressure from rising inflation and stagnated consumption. In 2016, the country's economy is likely to contract by 1 percent.²⁹ However, the steps being taken by the current government towards structural changes in the economy are expected to bring back the momentum in the economy and move towards a steady growth rate of 2–2.5 percent between 2017 and 2020.³⁰

¹⁶Brazil Country Profile, Foreign & Commonwealth Office, Accessed on December 28, 2011

¹⁷Brazil Country Profile, EIU, Accessed on December 28, 2011

¹⁸Brazil Analysts Cut 2015 GDP Forecast, Boost Inflation Estimate

¹⁹Moody's Analytics: Brazil Monetary Policy, Accessed on May 19, 2015

²⁰Brazil Worst Budget Deficit Shows 'Tougher Measures' Needed

²¹CIA: The World Factbook, Accessed on May 20, 2015

²²CIA: The World Factbook, Accessed on May 20, 2015

²³CIA: The World Factbook, Accessed on May 20, 2015

²⁴Brazil Country Profile, EIU, Accessed on December 28, 2011

²⁵IMF Press Release on April 10, 2015

²⁶Brazil Posts First Trade Deficit Since 2000

²⁷CIA: The World Factbook, Accessed on May 20, 2015

²⁸Instituto Brasileiro de Geografia e Estatística (IBGE), July 2014 estimates

²⁹IMF trims global forecast, as Brazil, Canada outlooks deteriorate

³⁰IMF Press Release on April 10, 2015

06 Fraser institute rankings

Economic Freedom of the World 2013 Report³¹

Among the 152 countries covered in the Fraser Institute's 'Economic Freedom of the World 2014' report, Brazil ranked 103rd, slipping one position from its last year's rank as it scored 6.61 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 152 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:

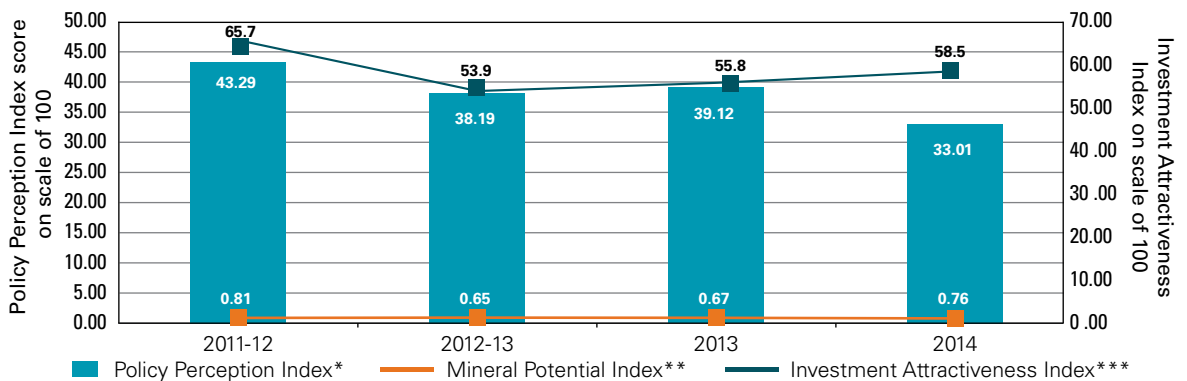
- Size of government: expenditures, taxes, and enterprises
- Legal structure and security of property rights

- Access to sound money
- Freedom to trade internationally
- Regulation of credit, labor, and business

Survey of Mining Companies 2014³²

Brazil ranked 52 on 'Investment Attractiveness Index' among the 122 countries in the Fraser Institute's 'Survey of Mining Companies 2014'. On other indices such as Policy Perception and Best Practices Mineral Potential, Brazil ranked 87 and 20, respectively. Figure 1 provides the country's scores on the key indices of the survey.

Figure 1: Brazil's scores, Fraser Institute's Survey of Mining Companies 2014



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.

³¹Economic Freedom of the World 2014 Annual Report, Fraser Institute, October 2014

³²Survey of Mining Companies: 2014, Fraser Institute, February 2015

07

Regulatory environment^{33,34,35,36,37}

For the mining sector, Brazil has a complex regulatory framework, with jurisdiction and approval processes divided among municipal, state, and federal governments. At the federal level, there are three key government agencies – the Ministry of Mines and Energy (MME), the National Department of Mineral Production (DNPM), and the Geological Survey of Brazil (CPRM).

In Brazil, mineral exploration licenses are granted by the DNPM and development concessions are issued by the MME. The DNPM has the responsibility of managing Brazil's mineral resources, including the supervision of the mining activity and the enforcement of mining related laws. The CPRM is the national agency responsible for collecting information on the country's geology, minerals and water resources.

The Ministry of Environment is responsible for developing environmental regulations. While the National Council of Environment (CONAMA) implements these regulations, the Brazilian Institute for Environment and Renewable Resources (IBAMA) acts as the primary licensing entity. 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)

In Brazil, exploration licenses (with three years' validity) are granted by the DNPM. Such licenses are then renewed based on analysis and approval of the Final Exploration Report. Mining concessions are granted by the MME, within a year of approval of the exploration report. The concessions are granted for the period until the mineral deposit is exhausted.

The Mining Code (Act No. 227) of 1967 governs mining in Brazil. Aimed at providing an impetus to foreign investment in the mining sector, the mining code was amended in 1996, to provide greater

flexibility to foreign investors. General foreign investment laws and regulations protect foreign mining investment. Successive amendments to the constitution have now made it possible for foreign entities to have 100 percent ownership of Brazilian companies.³⁸

Brazil is in the process of overhauling its mining sector policy. The plan of a new mining policy was first announced in 2009. In June 2013, the Brazilian Government submitted a bill of law (PL 5807) to the National Congress for replacing the current mining code. However, the approval of the bill has been stalled for various reasons including contestation of provisions to increase royalties, quick timeframe for implementation, the intended auction process, etc.³⁹ The new mining code, if approved, will introduce substantial changes to the provisions of the current mining code, which include:

- Creation of the National Council for Mining Policy (CNPM) to assist the president in strategic decision
- Increase in the royalties charged for the exploration of natural resources
- Unification of the current exploration and exploitation licenses under a single mining license.
- Dissolve the National Department of Mining Policy (DNPM) and create a regulatory agency, the National Mining Agency (NMA) that will be provided with the authority not only to regulate and supervise the mining sector, but also to organize public bidding for the concession of new mineral rights.^{40,41,42}

On November 11, 2013, an amended bill of law was released.⁴³ The passage of the bill was delayed due to the opposition's protests on various provisions of the bill and the national elections in 2014. The government is presently planning to rework parts of the proposed mining code.⁴⁴

³³Mining in Brazil – State of the Industry Review, InfoMine, October 2011

³⁴Brazil – Not a Country for Beginners, Engineering & Mining Journal, February 10, 2011

³⁵What You Need To Know About Brazil's New Mining Code, And Why Vale Could Be Oversold, Business Insider, September 09, 2011

³⁶Brazil's New Mining Code To Introduce National Input Rule –ABDI, FOX Business, September 26, 2011

³⁷Brazil mining code to limit new licenses-report, Reuters, November 4, 2011

³⁸Brazil, Latin Lawyer, April 2014

³⁹Debate Over Brazil's New Mining Code Shifting Gears, December 24, 2015

⁴⁰New Brazilian Mining Code Is Proposed By The Brazilian Government, Monday, June 26, 2013

⁴¹New Brazilian Mining Code Under Discussion At The National Congress, Mayer Brown, January 2014

⁴²Brazil – Mining Law 2015

⁴³New Brazilian Mining Code Under Discussion At The National Congress, Mayer Brown, January 2014

⁴⁴Brazil to Rework Mining Code Stalled in Congress, Minister Says, January 2015

08

BM&FBOVESPA – Brazil exchange

BM&FBOVESPA is one of the largest exchanges in the world in terms of market value.

BM&FBOVESPA Listed Mining Companies – R\$ thousand⁴⁵

Segment: *Metallic Minerals*

Company	Ticker	Net Worth	Number of Shares – Thousand (ex-treasury)
VALE	VALE	152.205.316	5.153.375
LITEL	LTEL	28.040.413	278.642
MANABI	MNBI	1.341.765	1.040
MMX MINER	MMXM	-655.867	162.205

Segment: *Non-metallic Mineral*

Company	Ticker	Net Worth	Number of Shares – Thousand (ex-treasury)
CCX CARVAO	CCXC	191.132	170.123

⁴⁵BM&FBOVESPA Website. Accessed on May 21, 2015



09

Sustainability and environment

One of the most important aspects of sustainability in Brazil's mining sector has been Climate Change mitigation, which led to adoption of emission reduction commitments. Brazil established the National Policy on Climate Change in 2009, which incorporated a voluntary reduction target between 36.1 to 38.9 percent of projected Green House Gas (GHG) emissions by 2020.⁴⁶ The government in 2010 legalized the policy nationally.⁴⁷

Rapidly evolving regulatory environment for climate change in Brazil continues to add complexity to mining companies that are paralyzed between a position of action or reaction.⁴⁸ In 2012, Brazil announced that it plans to cut GHG emissions in the mining sector by 4 percent compared to emission levels in 2005 by 2020.⁴⁹ In some regions such as São Paulo and Rio de Janeiro, there are both state and municipal level legislation. São Paulo State Climate Change Policy establishes a 20 percent reduction target over a 2005 baseline until 2020, whereas the municipal level sets a 30 percent reduction target over a 2005 baseline by 2020. Rio de Janeiro has voluntarily committed to reduce GHG emissions by 20 percent compared to 2005 baseline, by 2020.

One approach taken by few mining companies was to enter the carbon market via the Clean Development Mechanism (CDM). CDM is a flexibility mechanism defined under the Kyoto Protocol, which allows developed countries to meet their emission targets by trading carbon credits generated from investing in emission reduction projects in developing countries. However, due to uncertainty in regulatory environment, companies are likely to shift to a risk management approach – comprising GHG inventory elaboration and accounting of emissions reductions – and enabling them to hedge against future regulations.

Other companies adopted a wait and see policy – prolonging until external stakeholders ask for data on their carbon footprints. The rapid interest from the investment community and organizations such as the Carbon Disclosure Project (CDP) and Sao Paulo Stock Exchange (BM&F Bovespa) resulted in many mining companies having to develop GHG accounting systems overnight to comply with increasing demands for non-financial information.

Mining companies are now preparing for national and local emission trading market, which is expected to be adopted in the country in the future. Companies are increasingly focused on emission minimization, given the competitive advantage of low-carbon products.⁵⁰ Extensive measures are being taken to reduce carbon footprints, such as incorporating emission reduction strategies into mine design, optimizing mining operations through fuel switching, upgrading outdated machineries, and launching innovative carbon reduction programs, etc.⁵¹

⁴⁶Climate Change in Brazil: economic, social and regulatory aspects, Institute for Applied Economic Research, 2011

⁴⁷The World's Carbon Markets: A Case Study Guide to Emissions Trading, Environmental Defense Fund, May 2013

⁴⁸Brazil changes mining rules for environment, Eco news, June 20, 2013

⁴⁹Brazil sets modest 2020 GHG targets for three sectors, Thompson Reuters Foundation, June 18, 2012

⁵⁰Mining in Brazil, Global Business Reports, 2012

⁵¹Carbon footprinting: Coming Clean, MPE Magazine



10 Taxation^{52,53}

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).

Mineral product	Rate (%)
Bauxite, manganese ore, rock salt and potassium	3.0
Iron ore, fertilizers, mineral coal and other mineral substances	2.0
Gold* (when produced in prospecting, it is exempt)	1.0
Precious carbon, colored, cuttable stones and precious metals	0.2

*Gold produced in prospecting is exempt

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 commercialization, as well as the expenses with transport and insurance.

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 the sum of direct and indirect costs incurred until the moment of the utilization of the mineral extracted.

The Federal government is currently studying a possible hike on the rate of CFEM under the proposed Mining Code, which is still under consideration in the National Congress.

TFRM

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

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.

⁵² [Mining in Brazil – State of the Industry Review, InfoMine, October 2011](#)

⁵³ [Brazil – Not a Country for Beginners, Engineering & Mining Journal, February 10, 2011](#)

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.





Transfer Pricing Policy

As Brazil does not follow OECD Transfer Pricing Rules. Commodities transactions are 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.

When a commodity is not recognized on an international futures and commodities exchange, the following methodology can be used: i) independent data provided by an industrial research institute internationally recognized as defined by Brazilian Federal Revenue; ii) prices published in the Official Daily Gazette by agencies or regulatory bodies for export transactions comparisons.

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.

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.

Other tax considerations

- Import tax (II): In the case of mineral products, the rates of this tax might vary from 2 percent to 8 percent.
- Export tax (IE): Does not apply to exported mineral products (exempt).
- Tax on industrialized products (IPI) does not apply to mining activities.

Changes in Mining tax Provisions under proposed New Mining Code

The proposed New Mining Code will bring several changes to the mining tax provisions. The new code, if approved without amendments, will increase royalties to 4 percent and tighten the rules for owners of mining claims.

Further, the royalties from mineral exploitation (CFEM) will no longer be levied on the net revenues of mineral sales, but on gross revenues. This is expected to place more pressure on the mining companies, as they will no longer be able to deduct costs such as transportation before calculating royalties.⁵⁴

The bill also proposed to retain the existing allocation of royalties; with 65 percent going to municipalities affected by mining, 23 percent to producing states and 12 percent to the federal government.

⁵⁴Article 36 of the Bill No 5,807/2013

11 Power supply

Brazil is the biggest electricity market in South America. Of the total 1,135TWh generated during 2013 in the region, Brazil alone accounted for 516TWh, or 45 percent of the entire region's electricity generation.

The total installed capacity of the country was 129 GW at the end of 2013, and is expected to witness a steady increase in the short to medium term to meet the growing demand. As per the Electricity in the 2023 Brazilian Energy Plan (PDE 2023), the government estimates that a total installed capacity of 196 GW would be required by the end of 2023, growing at an annual rate of 4.6 percent, to keep up with the rise in demand. During this period, the total consumption of electricity is also expected to go up from 516TWh to 780TWh.⁵⁵ As on May 21, 2015; Brazil's total installed capacity was recorded as 134 GW by the Brazilian Electricity Regulatory Agency (ANEEL).⁵⁶

Brazil's generation capacity mix is largely dominated by hydropower, which accounted for nearly 60 percent of its total at the end of 2013. The share of hydro generation is further accentuated from the actual supply standpoint, where it accounts for close to 75 percent of the total. The next big contributor to the installed capacity is natural gas, with a share of 12.2 percent. Biomass (11.5 percent), oil (7.8 percent), small hydro (4.9 percent), coal (3.4 percent), wind (2.2 percent) and nuclear (2.0 percent) are the other major sources of generation.⁵⁷

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 2009, the country generated 85 percent of its total electricity from renewable sources. Apart from having vast potential of hydroelectricity, Brazil also has an estimated potential of 300 GW and the latest figures for installed capacity in wind sector are pegged at around 6 GW^{58,59,60} turning Brazil into the second biggest generator in the wind sector behind China. It is expected that solar will follow the same way, reaching at least 3 GW of installed capacity by 2020.

Brazil is expected to invest nearly US\$129 billion in electricity infrastructure between 2013 and 2023, representing nearly 24 percent of the total expected investment of US\$540 billion in the entire energy sector. As per the government's Brazilian Energy Plan (PDE 2023), of the US\$129 billion of investment in electricity infrastructure, nearly 74 percent would be in the generation projects. The remaining percentages, while the rest would be in the field of transmission, which requires huge investment in order to integrate the new and upcoming generation projects of the north region with the major consumer centers.⁶¹

⁵⁵ Electricity in the 2023 Brazilian Energy Plan (PDE 2023), September 2014 Edition

⁵⁶ ANEEL: Electricity Database, Accessed on May 21, 2015

⁵⁷ Brazilian Energy Plan (PDE 2023), September 2014 Edition

⁵⁸ Brazil to Offer Ambitious Climate Plan With More Renewables, April 16, 2015

⁵⁹ Why isn't Brazil Exploiting its Amazing Wind Capacity, November 21, 2014

⁶⁰ Brazil Hits 6 GW of Operational Wind Power Capacity, May 18, 2015

⁶¹ Brazilian Energy Plan (PDE 2023), September 2014 Edition





12 Infrastructure development

After a decade of rapid growth, the Brazilian economy seems to be slowing. The low quality of its infrastructure has been found to be a major barrier to economic expansion in Brazil. The state of facilities in sectors such as transportation, energy, and water are found to be lacking in many ways. The World Economic Forum's Competitiveness Rankings on infrastructure place Brazil at 76th position among 144 countries.⁶²

One of the key reasons behind the poor state of the infrastructure is low public and private investments in these sectors. Brazil's investment in infrastructure has remained around 2 to 2.5 percent of the GDP for many years. Given the ongoing slump in the economy, it is a challenge for the Brazilian government to accelerate investments in building and upgrading the infrastructure of the country.⁶³

In 2007, the government announced the first wave of an investment program (Programa de Aceleração do Crescimento – PAC) to accelerate the country's growth plans, comprising a US\$225 billion jump-start program for infrastructure development in energy, transportation, housing, sanitation, etc. The second wave of the program (PAC 2) was announced in 2010 to begin in 2011 with the objective of attracting major infrastructure contracts, particularly as Brazil hosted 2014 FIFA World Cup and is preparing to host the 2016 Summer Olympic Games in Rio de Janeiro.^{64,65}

The Logistics Investment Program (PIL), an initiative to attract investments in the transportation sector, was launched in 2012, which targets the following:⁶⁶

- Concession of 7,500 km of highways to be duplicated in five years
- Concession of 10,000 km of railways to be constructed in five years

- Concession of two major airports: Galeão (Rio de Janeiro) and Confins (Belo Horizonte)
- Modernization of 270 regional airports
- Remodeling and leasing of nearly 150 port terminals inside public ports

The government has moved towards bringing in private sector investments in the infrastructure projects. It began with privatization of airports, and opening road sector projects for the private companies at attractive Internal Rates of Return (IRRs), and the state-run Brazilian National Development Bank (BNDES) offering funds at subsidized rates. BNDES disbursed loans worth US\$85 billion in 2013, one-third of which went to the infrastructure-related projects. In the same year, Brazil auctioned nearly US\$40 billion of investment opportunities in the infrastructure projects. The next phase of PIL was announced by President Dilma in June 9th, 2015, inviting private participation in airports, ports roads and railways concessions worth USD 64 billion.⁶⁷ However, some reports have suggested that the privatization initiatives for the railways may get delayed.⁶⁸

In a recent study, the Brazilian National Development Bank (BNDES) has projected BRL4.07 trillion (US\$1.89 trillion) worth of investments in Brazil's economy during the period 2014–2017, among which infrastructure will account for approximately BRL575 billion (US\$267 billion) driven primarily by investments in ports and railways.⁶⁹

China has recently signed intention letters with the Brazilian government to finance infrastructure projects worth US\$50 billion, which should help revamp the Brazilian railway infrastructure.⁷⁰

⁶²Global Competitiveness Report 2014-15, World Economic Forum

⁶³Investment Guide to Brazil, 2014

⁶⁴Brazil is Betting on a New Growth Model: Infrastructure, September 10, 2014

⁶⁵Infrastructure Investment In Northeastern Brazil, Brazil-works.com, August 12, 2013

⁶⁶The Logistics Investment Program

⁶⁷Brazil is Betting on a New Growth Model: Infrastructure, September 10, 2014

⁶⁸Brazil Likely to Exclude Railways from New Infrastructure Auctions, April 25, 2014

⁶⁹BNDES study shows Brazil will receive R\$ 4 trillion in investments between 2014-2017, BNDES, May 22, 2014

⁷⁰China to Invest \$50bn in Brazil Infrastructure, May 15, 2015

13

Labor relations and employment situation

The employment relationship in Brazil is strongly regulated and there is limited negotiation of conditions as the rights and duties of both employers and employees are stated in the Consolidation of Brazilian Labor Laws (CLT), issued in 1943. Labor rights can also be regulated by collective bargaining and Agreements that complement CLT for specific groups and/or categories. Any individual remunerated for services, on frequent basis, under employer subordination (obedience to rules and orders given by the employer) is an employee and no formal written employment agreement is required as oral agreements are fully valid and enforceable, subjecting the employee and employer to the rules and regulation of the CLT. The country's employee-centric regulations have proven costly to many international companies in labor settlements.^{71,72}

The Brazilian employment market has not followed the overall recessionary trends of the nation's economy. Brazil's unemployment rate for 2013 was 5.4 percent in comparison to 5.5 percent in 2012. It ended 2014 with a record low unemployment rate of 4.3 percent. Although in the initial months of 2015, there has been a steady rise in the rate of unemployment, and has reached the highest level of the last three years.^{73,74,75}

Brazil is currently facing a shortage of skilled labor. The National Confederation of Industry (CNI) expects a labor shortage of 570,000 workers in 2014 and 2015⁷⁶. For example, the highest demand gap is in qualified and bilingual professionals and estimates indicate a five-digit lack in engineers.

As per a Talent Shortage Survey, 2015 by Manpower, Brazil was among the top five countries where employers expressed difficulty filling the job openings during 2014. Sixty-one percent of Brazil's employers reported that they faced talent-shortage, whereas, the global average was 38 percent.⁷⁷

To help the employers affected by skilled labor-shortages, Brazil's Ministry of Labor has steadily increased temporary work visas for foreign technical workers. Following this move, Brazil's automakers, construction firms, energy and mining companies have started hiring from the bordering nine countries.⁷⁸

The mining sector in Brazil has also been affected due to shortage in skilled workforce. The sector is growing fast and demands an increasing number of skilled workers to confront this trend. Many mining companies operating in Brazil are facing project delays and cost increase due to this shortage. Mining is still a male-dominated industry, but recent data has indicated an increasing presence of women over the past several years. In 2011, the mineral sector employed about 2.2 million workers directly, apart from the jobs generated during exploration; prospecting; and planning stages and the people working in the panners. The mining industry in Brazil faces challenges such as lack of qualified employees, more demand for professionals than the market can offer, and an increase in the salaries stimulated by aggressive competition among mining industries, causing a huge turn over.⁷⁹

⁷¹Ten questions regarding Brazilian labor and employment law, *Lexology*, March 18, 2013

⁷²Navigating Labor Compliance in Brazil, *SHRM.org*, August 5, 2013

⁷³UPDATE 3-Brazil economy ends 2013 on an upbeat note, boosting Rousseff, *Reuters*, February 27, 2014

⁷⁴Brazil's 'Blessed' Unemployment Rate, *Forbes*, October 24, 2013

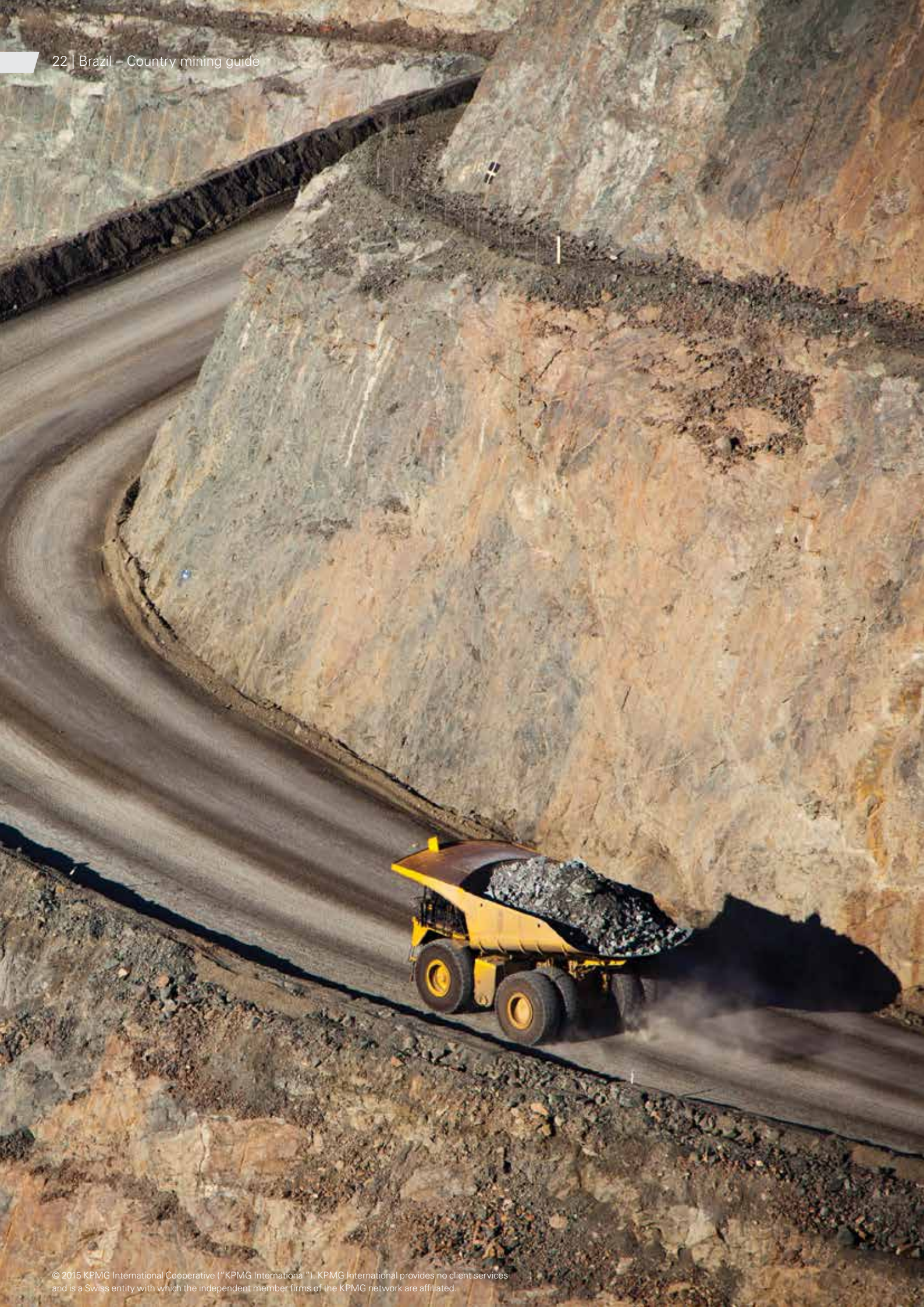
⁷⁵Brazil's March Unemployment Rate Climbs in Blow to Rousseff, *Bloomberg*, April 28, 2015

⁷⁶Brazil Seeks Over a Million Skilled Workers in 2014-2015, *The Rio Times*, January 21, 2014

⁷⁷2015 Talent Shortage Survey Results Report, *Manpower*

⁷⁸Brazil's Economic Trap, *Fortune*, January 15, 2014

⁷⁹Brazil Said to Require Local Content on New Mining Contracts, *Bloomberg*, February 7, 2012



14 Inbound and outbound investment

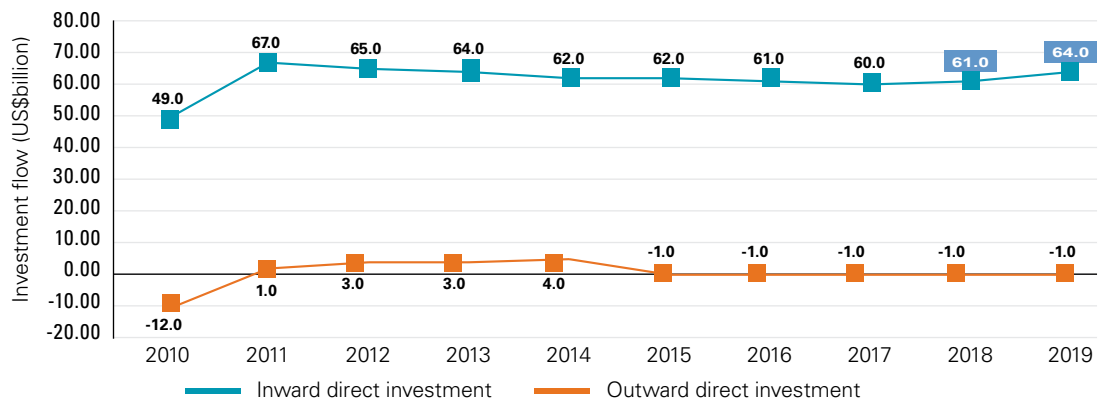
Foreign direct investment (FDI) has seen a tremendous rise in Brazil, peaking at US\$67 billion in 2011.

Post 2011, the scale of FDI seems to have stabilized as it attracted US\$65, 64, and 62 billion during 2012, 2013, and 2014, respectively. According to EIU, the total FDI in Brazil is likely to stay at the same level as compared to the prior

year. The percentage contribution of FDI towards the GDP of Brazil has been around 3 percent in recent years, and is expected to maintain similar levels in the short-term.

The country's inward direct investments have been outpacing its foreign outward investment, as shown in Figure 4.

Figure 4: Trend for inward and outward direct investment in Brazil



Source: EIU

Due to weak metal prices and rising costs, the mining industry in Brazil is believed to be facing a decline in investment over next few years, according to the mining institute Brazil, IBRAM. IBRAM has projected weaker investment projection for 2014-18 (US\$ 53.6 billion), as compared to 2012-16 (US\$75 billion).⁸⁰

The World Bank's survey report 'Doing Business 2015' on the ease of doing business has ranked Brazil as 120th (up from 123rd in the 2014 report), out of the 189 countries surveyed. Along with the gradually improving business environment, Brazil also has huge reserves of minerals and holds a great opportunity for prospective investors.⁸¹

⁸⁰Investments in Mineral Sector, IBRAM, Accessed on May 21, 2015

⁸¹Doing Business Ranking 2015, Accessed on May 22, 2015



15

Key commodities – Production and reserves

Production level of key commodities in Brazil

Brazil is a leading producer of minerals – producing and marketing nearly 80 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 until 2014. Brazil is the world's largest producer of niobium and second largest of iron ore and manganese. Further, it is the third largest producer of bauxite and fifth largest producer of tin and copper. In addition, Brazil is an importer of mineral coal, potash, copper, zinc, sulfur, etc.^{82, 83}

In the last few years, Brazil's mining industry has contracted due to the slowdown in the

world economy. Brazil's export of iron ore (the cornerstone of its mineral exports) to emerging economies such as China has taken a severe hit. After reaching US\$53 billion in 2011, the mining industry has been on a continuous decline. In 2014, the total production was much lower at US\$40 billion. According to Brazilian Mining Institute's (IBRAM) estimates, it is likely to stay subdued in 2015 as well, with a projected output worth US\$38 billion.⁸⁴

The projected investment in the minerals and mining sector is also likely to be affected. The investment projection has been reduced from US\$75 billion for 2012-16, to US\$53.6 billion for 2014-18.⁸⁵

Ores	Production on 2011 (1,000 tons)	Expected Production by 2016 (1,000 tons)	Change (%)
Aggregates	673,000	849,000	26
Iron	369,000	820,000	122
Bauxite	31,000	38,000	23
Manganese	2,600	3,000	15
Phosphate	1,800	2,500	39
Copper	400	600	50
Nickel	70	100	43
Zinc	285	350	23
Niobium	90	120	33%
Gold	0.066	0.095	44

Source: IBRAM

⁸² Brazil's mineral production value down 9% in 2013, BNamericas, February 25, 2014

⁸³ An Optimistic Outlook for Mining in Brazil, IBRAM, March 2013

⁸⁴ Evolution of the Brazilian Mineral Production (PMB), IBRAM, Accessed on May 21, 2015

⁸⁵ Investments in Mineral Sector, IBRAM, Accessed on May 21, 2015



Classification of Brazil's mineral production and reserves compared with the world's total

Mineral	%BRA vs. World production	Ranking Position	%Brazil vs. World reserves	Ranking Position
Bauxite	14%	3 rd	6.8%	5 th
Copper	2%	5 th	2%	13 th
Ornamental Rocks	7.7%	3 rd	5.6%	6 th
Gold	2.3%	12 th	3.3%	9 th
Iron Ore	17%	2 nd	11%	5 th
Kaolin	6.8%	5 th	28%	2 nd
Manganese	20%	2 nd	1.1%	6 th
Niobium	98%	1 st	98%	1 st
Tantalite	28%	2 nd	50%	1 st
Tin	4.1%	5 th	13%	3 rd
Zinc	2.4%	12 th	0.85%	6 th

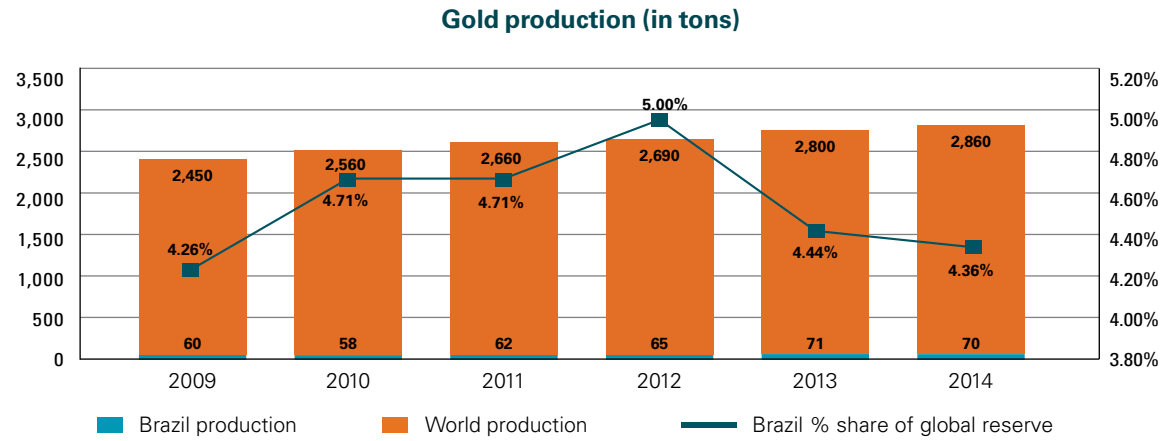
Source: PNM 2030/IBRAM – 2012

Mineral production: Global position of Brazil

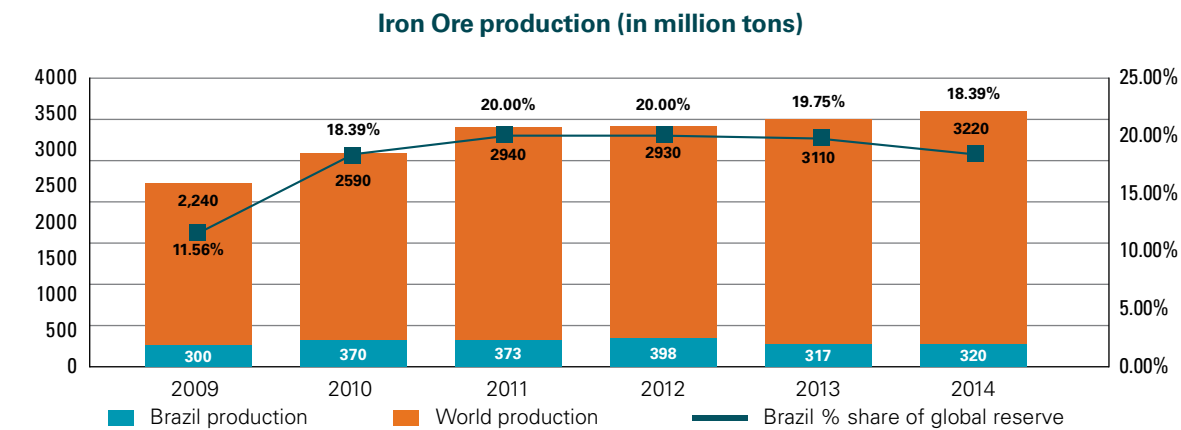
Exporter (Global player)	Exporter	Self-sufficient	Importer/producer	External dependency
Niobium (1 st)	Nickel	Limestone	Copper	Metallurgical Coal
Iron Ore (2 nd)	Magnesite	Industrial Diamond	Diatomite	Sulphur
Manganese (2 nd)	Kaolin	Talc	Phosphate	Potassium
Tantalite (2 nd)	Tin	Titanium	Zinc	Rare Earths
Graphite (3 rd)	Vermiculite	Tungsten		
Bauxite (2 nd)	Chromium			
Ornamental Rocks (4 th)	Gold			

Source: DNPM/PNM 2030/IBRAM – 2012

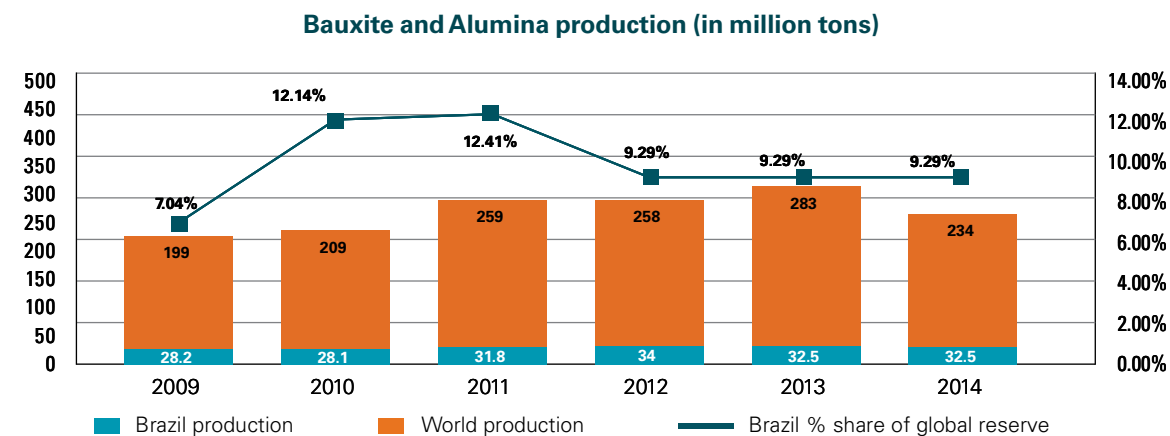
Figure 2: Production level of key commodities in Brazil⁸⁶



Source: USGS



Source: USGS

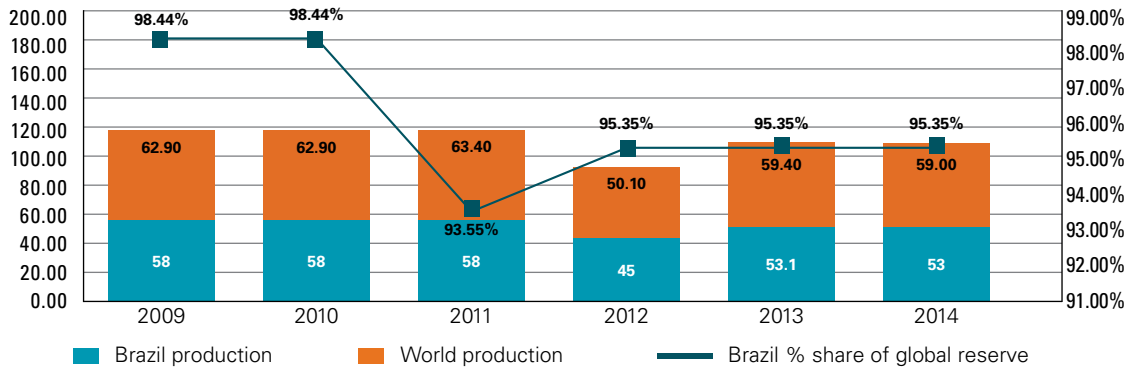


Source: USGS

⁸⁶ 2013 Survey of Energy Resources, World Energy Council

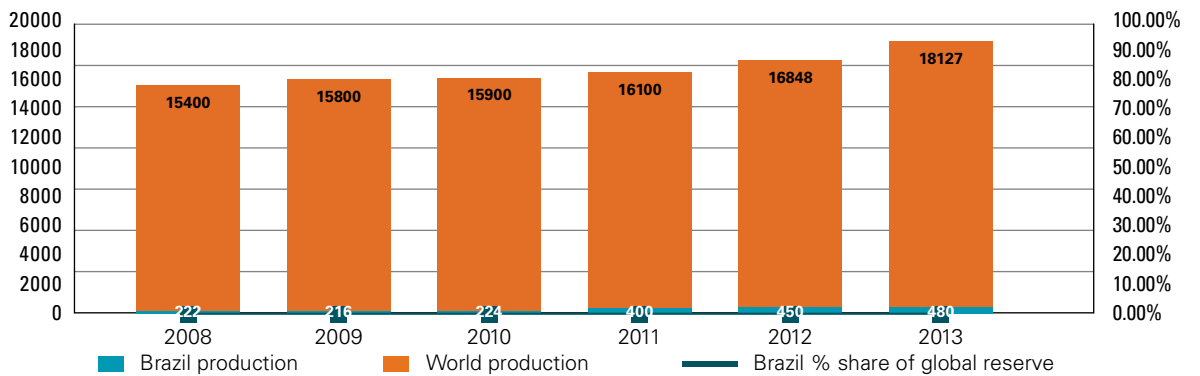


Niobium production (in thousand metric tons)



Source: USGS

Copper production (in thousand tons)



Source: USGS/DNPM/ICSG e Index Mundi – 2012



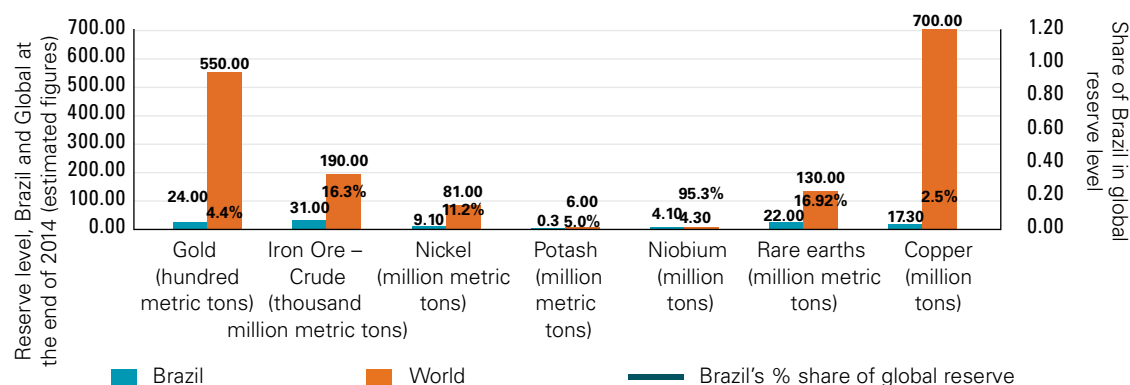
Brazil's share of key commodities in global reserves

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 (16,000 million metric tons), nickel (9.1 million metric tons) and

potash (300 thousand metric tons).⁸⁷ 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 and Australia.

Figure 3, below provides the reserve level of key commodities in Brazil and the country's share in the global reserve level, at the end of 2014.

Figure 3: Reserve level of key commodities in Brazil, end of 2013



Source: US Geological Survey, Mineral Commodity Summaries

⁸⁷ Website of USGS Accessed on May 22, 2015

16

Major mining and metal companies in Brazil^{88*}

Key domestic players (sales revenue of more than US\$250 million in 2013)

- | | |
|---|--|
| 1. Vale SA | 11. Votorantim Siderurgia S.A. |
| 2. Gerda SA | 12. MMX Mineracao E Metalicos SA |
| 3. Metalurgica Gerda SA | 13. Companhia De Ferro Ligas Da Bahia – Ferbasa. |
| 4. Companhia Siderurgica Nacional | 14. Mineracoes Brasileiras Reunidas S.A. |
| 5. Vicunha Siderurgia SA | 15. Nacional Minerios S.A. |
| 6. Usinas Siderúrgicas de Minas Gerais SA | 16. Aço Cearense Industrial Ltda. |
| 7. Samarco Mineração | 17. Soluções Em Aço Usiminas S/A. |
| 8. Parapanema SA | 18. Tupy Fundições Ltda. |
| 9. Companhia Brasileira de Alumínio S.A. | 19. Indústria Brasileira de Metais S/A |
| 10. Companhia Brasileira de Metalurgia e Mineração S.A. | 20. Votorantim Metais S.A. |

17

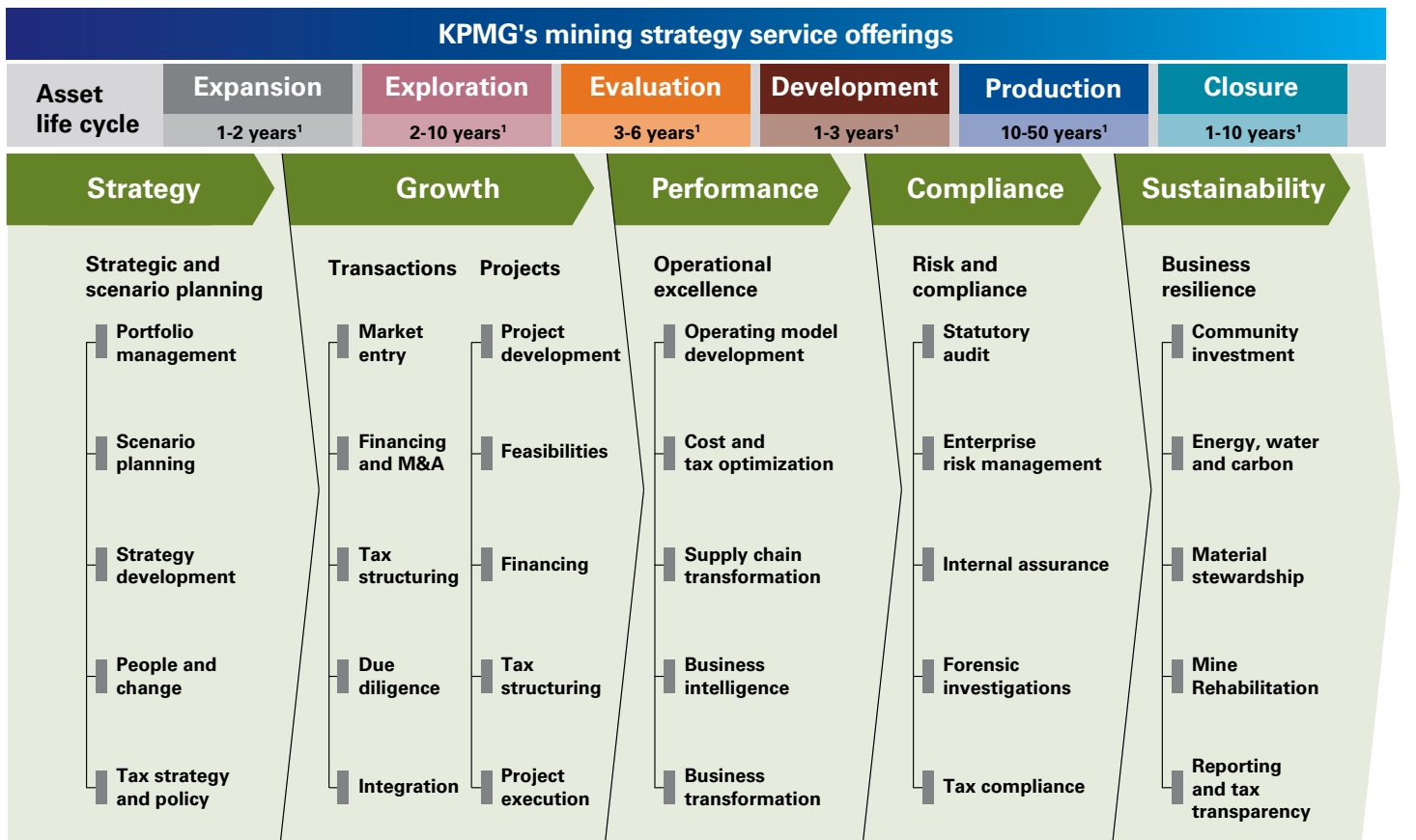
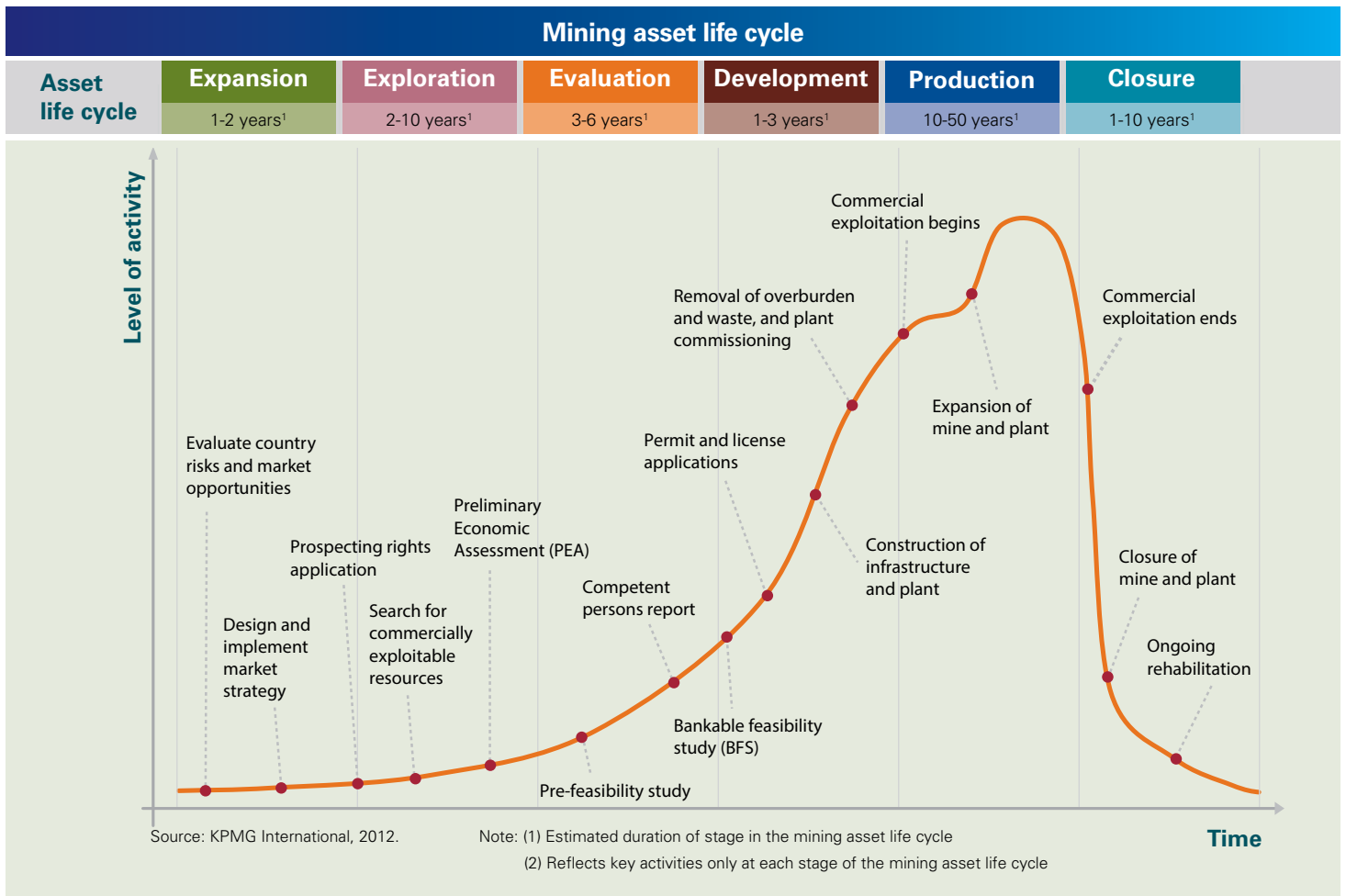
Foreign companies with operations in Brazil

- | | |
|---|--|
| 1. BHP Billiton Limited (Samarco Mineração S.A.) | 7. Anglo American plc. (Anglo American Brasil Ltda.) |
| 2. AngloGold Ashanti Ltd. (Sao Bento Mineracao S.A.) | 8. Yamana Gold, Inc. (Mineracao Maraca Industria e Comercio S.A.) |
| 3. Kinross Gold Corporation (Kinross Brasil Mineracao S.A., 51% of Paracatu Mine) | 9. Novelis Inc. (Novelis Do Brasil Ltda.) |
| 4. Alcoa Inversiones España S.L (Alcoa Aluminio S.A.) | 10. ThyssenKrupp CSA (ThyssenKrupp Companhia Siderúrgica do Atlântico) |
| 5. Norsk Hydro ASA (Albrás – Alumínio Brasileiro S/A.) | 11. Sao Bento Mineracao S.A. |
| 6. ArcelorMittal Brasil S.A. (Belgo Mineira Bekaert Arames S/A, ArcelorMittal Vega, Gonvarri Brasil SA) | 12. Technip (Flexibrás Tubos Flexíveis Ltda.) |

* Note: Methodology used for identification of mining companies:

- For the identification of top mining sector companies in Brazil, we accessed Capital IQ to generate the list of companies operating in Brazil in the following industry sectors: aluminium, coal and consumable fuels, diversified, metals and mining, gold and steel. The list was then filtered to exclude domestic Brazilian corporations with revenue less than US\$250 million in 2014.
- The list of foreign companies with operations in Brazil includes companies whose ultimate parent company was headquartered outside Brazil.

⁸⁸ Capital IQ, Accessed on June 30, 2014



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An eye to the future – Adapting to change in a volatile mining industry



This release from KPMG's Global Mining Institute provide thoughtful insights into implementing change and the benefits of transformation through standardization, outsourcing and divesting non-performing or core assets. After several years of unprecedented layoffs in the industry, talent and resource management will be critical to future success.

We therefore stress the need for international operators to have an effective mobility program that allows them to move resources from where they are to where they are needed, in a cost-effective and efficient manner, creating a strong, mobile and global workforce. Our analysis of talent management strategies highlights the benefits of having detailed, long-term output targets and matching resource needs accordingly.

Global Metals Outlook 2015



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In this report, KPMG International provides a comprehensive overview of current trends, issues and opportunities in the global metals sector. It includes valuable benchmarks as well as forward-thinking advice and practical insights from KPMG partners, industry experts and metals leaders.

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18 KPMG Global Mining practice

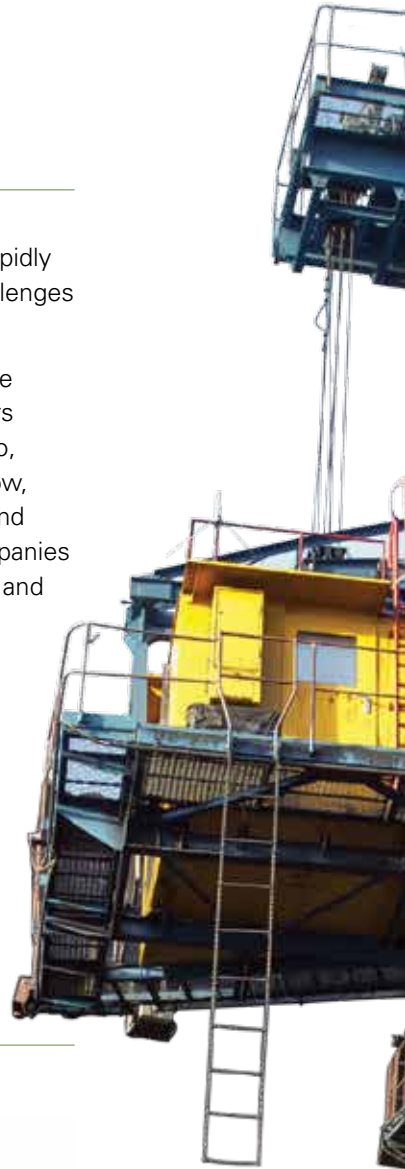
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19 Mining Centers





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