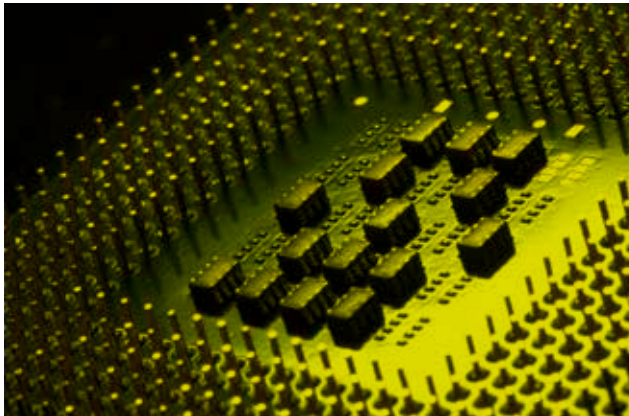


WHY MINAS GERAIS



STATE GOVERNMENT OF MINAS GERAIS

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Minas Gerais Investment and Trade Promotion Agency

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Introduction



In **Minas Gerais**, the mountains preserve not only natural riches, but also a **creative capacity** constantly explored. The state has a native ability in doing **good business** and gathers characteristics that allow ideas to become **opportunities**.

Excellent teaching institutions guarantee **knowledge development** and its specialisation, fostering the ingenious spirit that fuels Minas. Here we build the **future** and enterprise. Here business thrives. Our people are able to cultivate not only coffee, but also good and enduring **relations**.

Articulation, **networking** and alliance-building are legacies of our gregarious manner.

After being familiarised with Minas Gerais, it becomes clear that the **treasures** kept here are more than historical heritage cities or the flavour of our pão de queijo (Brazilian cheese bread): it is this very combination what makes Minas Gerais

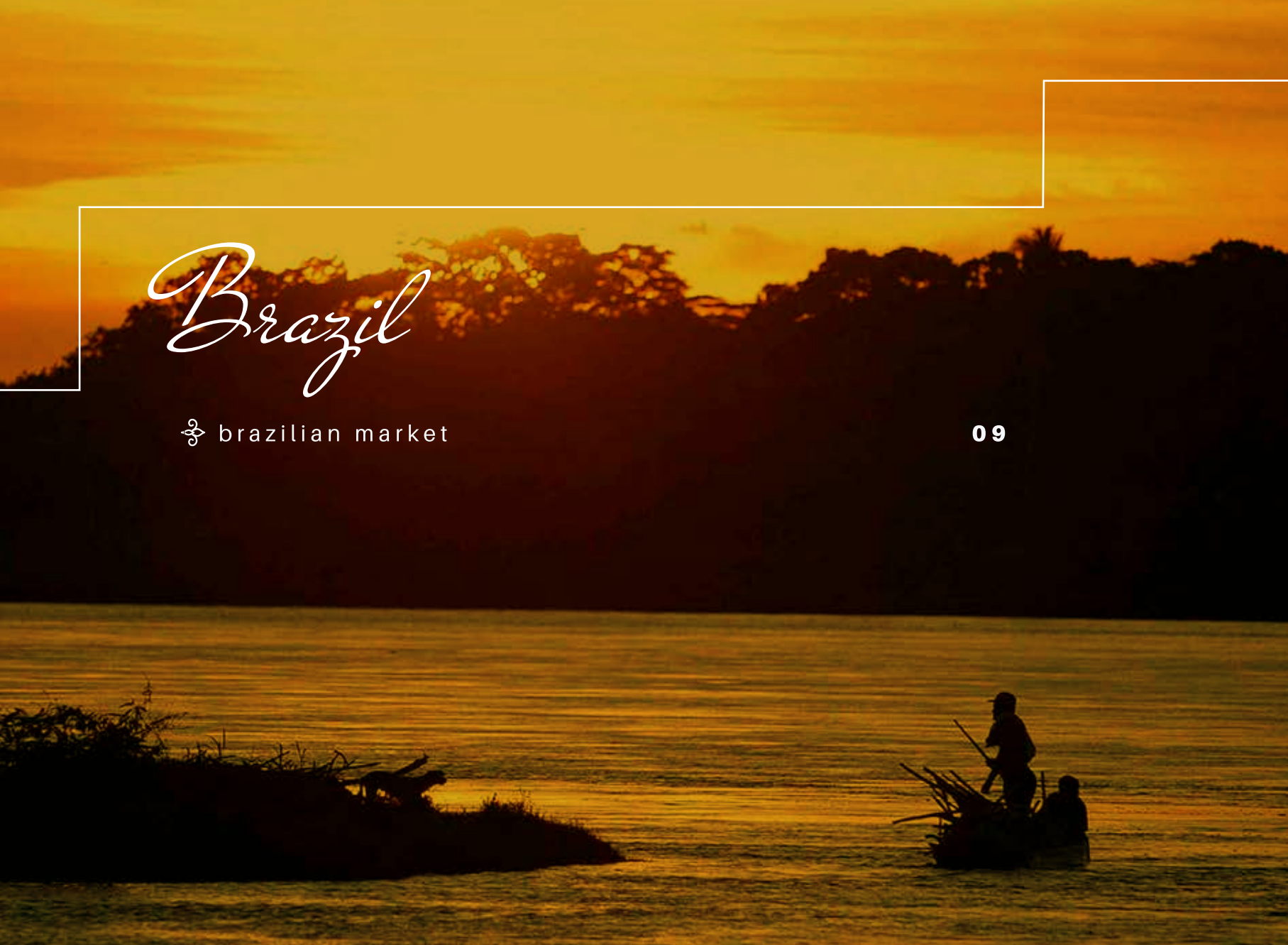
Precious.



Brazil

✿ brazilian market

09



206 million

inhabitants

9th largest world economy

GDP R\$ 5.9 / US\$ 1.77 trillion (2015)

8th largest country

To receive FDI in 2015 (UNCTAD).

7th country

Most quoted by CEOs to broaden their businesses in the next 12 months. (20th Annual Global CEO Survey, January 2017, PwC).

5th largest country

In territorial extension, allowing for great economic diversity in its different regions

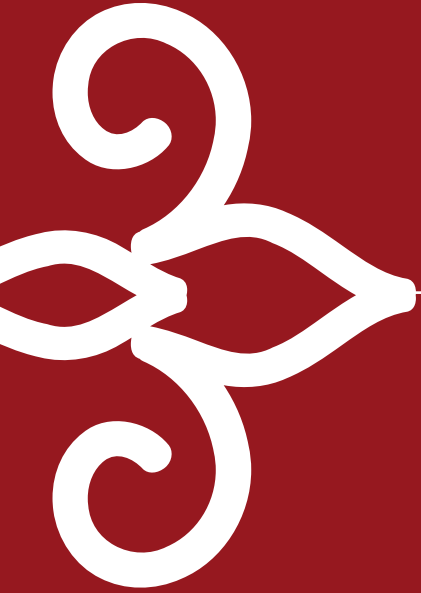
R\$ 3,9 trillion

Is the 2016 projected national consumption (iPC Marketing).

FDI INFLOWS 2015 top 10 host economies (Billions of dollars)

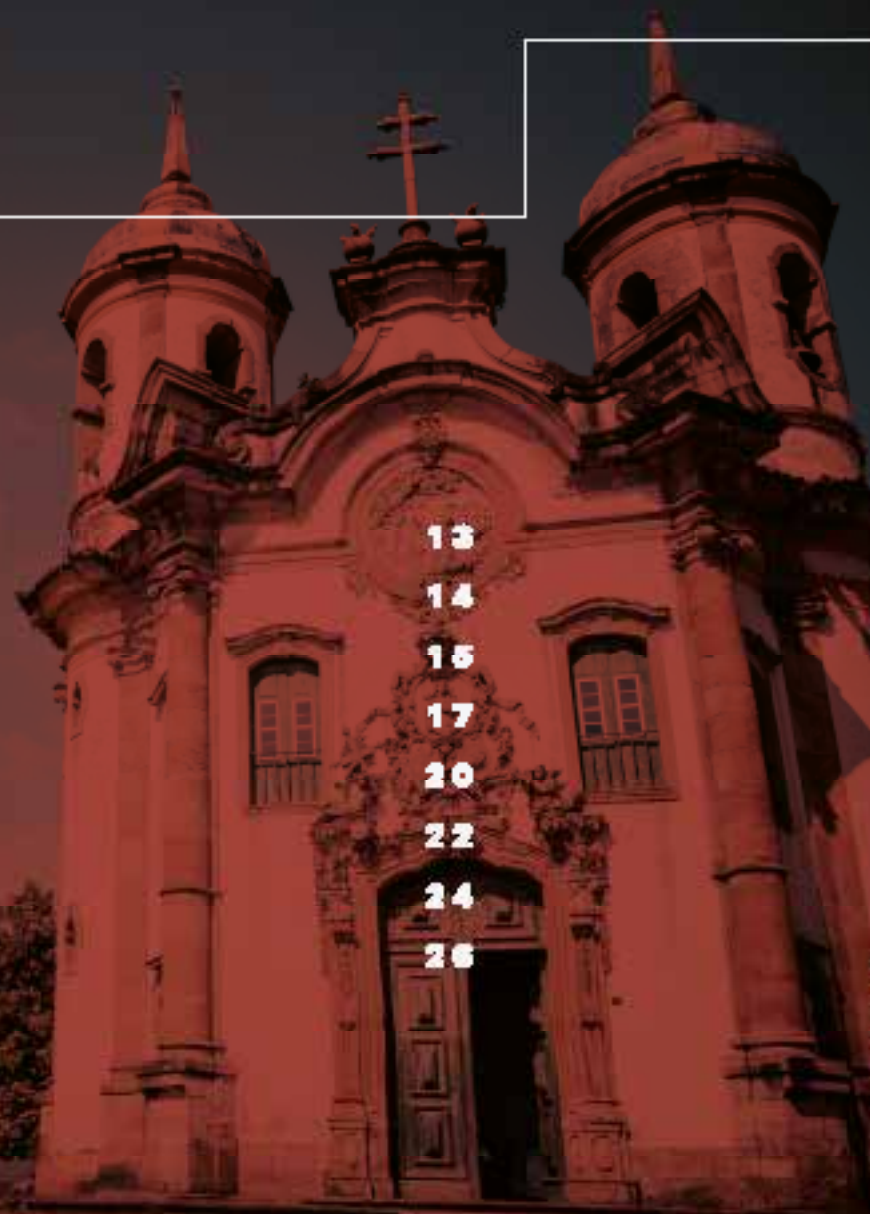


Source: UNCTAD (WIR, 2016)



Minas Gerais

✚ location	13
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Minas Gerais is located in the Southeast Region of Brazil (the most developed region in the country), with easy access to consumer markets and a privileged location. Neighbor to states such as São Paulo and Rio de Janeiro and the Center-West and Northeast Regions, the state of Minas Gerais is the main business corridor in Brazil.

- ❧ Third largest Brazilian economy
US\$ 158.8 bi GDP in 2015
- ❧ Second largest exporting state in Brazil
US\$ 21.9 billion in 2016
- ❧ Second largest population in Brazil: **21 million inhabitants**
(roughly the size of Australia)
- ❧ Larger than France or Spain in territorial extension
- ❧ Located in the southeast of Brazil, which is responsible
for 55% of the Brazilian GDP (IBGE)
- ❧ The state's GDP is comparable to countries such as
Hungary (US\$ 121.7 billion), New Zealand (US\$ 173, 7)
or Czech Republic (US\$ 185.1)*.

All these features contribute to the existence of an economic environment marked by diversified sectors, making the state the second largest consumer market in Brazil.

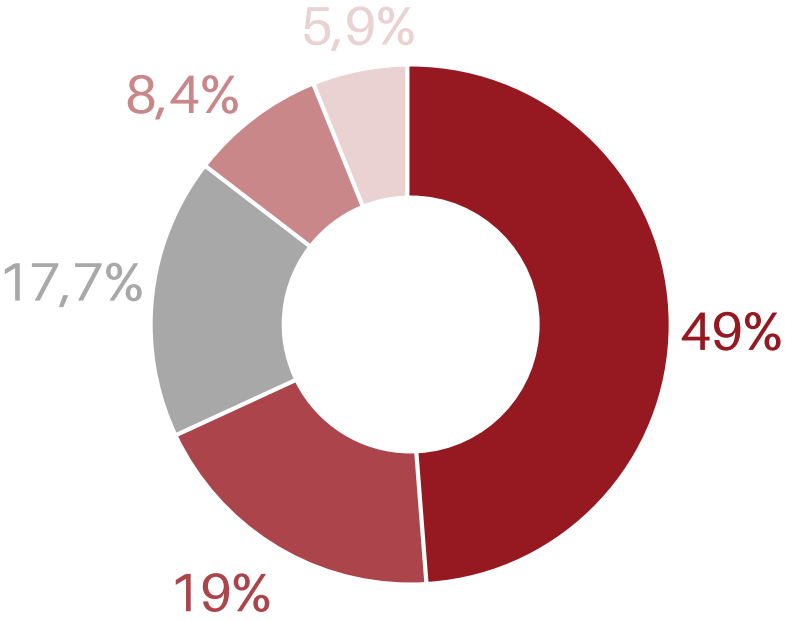
2015 data. Source: IBGE, MDIC, World Bank and Minaspart Desenvolvimento estimates.

Minas Gerais has the second largest consumer market in Brazil, with a 10.4% share, only behind the state of São Paulo. Considering the Southeast region as a whole, companies from Minas Gerais have a considerable logistic advantage: easy access to 49% of the Brazilian consumer market, with a consumption potential estimated at R\$ 1.826 trillion in 2016. The region also concentrates 50.3% of the 19.07 million Brazilian companies.

Brazilian state	Share in the consumer market(%)	Ranking
São Paulo (SP)	27,39	1
Minas Gerais (MG)	10,42	2
Rio de Janeiro (RJ)	9,18	3
Rio Grande do Sul (RS)	6,70	4
Paraná (PR)	6,34	5

Belo Horizonte, the state capital, stands out for being the 4th largest Brazilian city in terms of consumer potential. In 2015 it increased its share from 1.80% to 1.89% of the Brazilian total in 2016.

REGIONAL SHARE IN THE BRAZILIAN CONSUMER MARKET

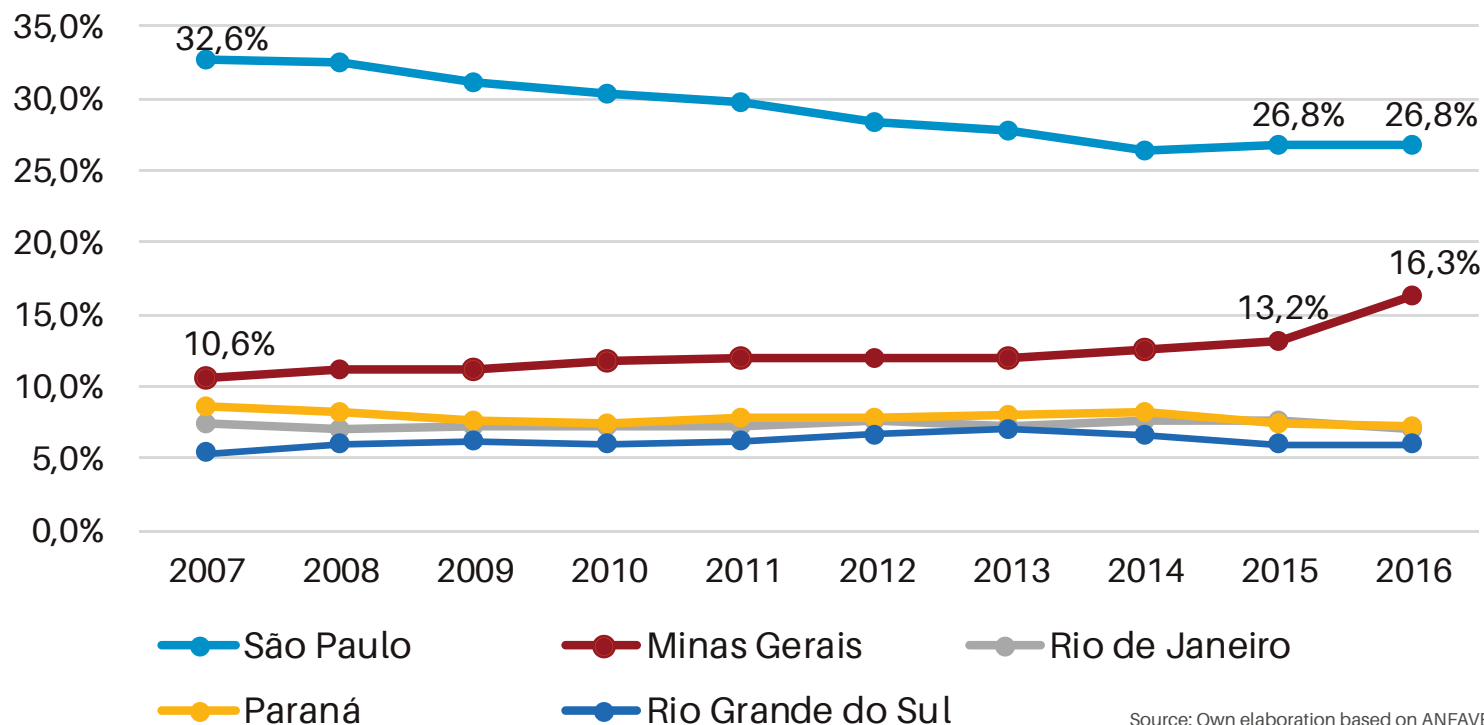


- Southeast
- Northeast
- South
- Center-West
- North

Source: Own elaboration based on IPC Marketing data (2016).

An example of the consumer market potential in Minas Gerais is represented by the evolution of its and a few states' shares in terms of vehicle licensing. In the last decade, Minas presented the largest growth among the top states.

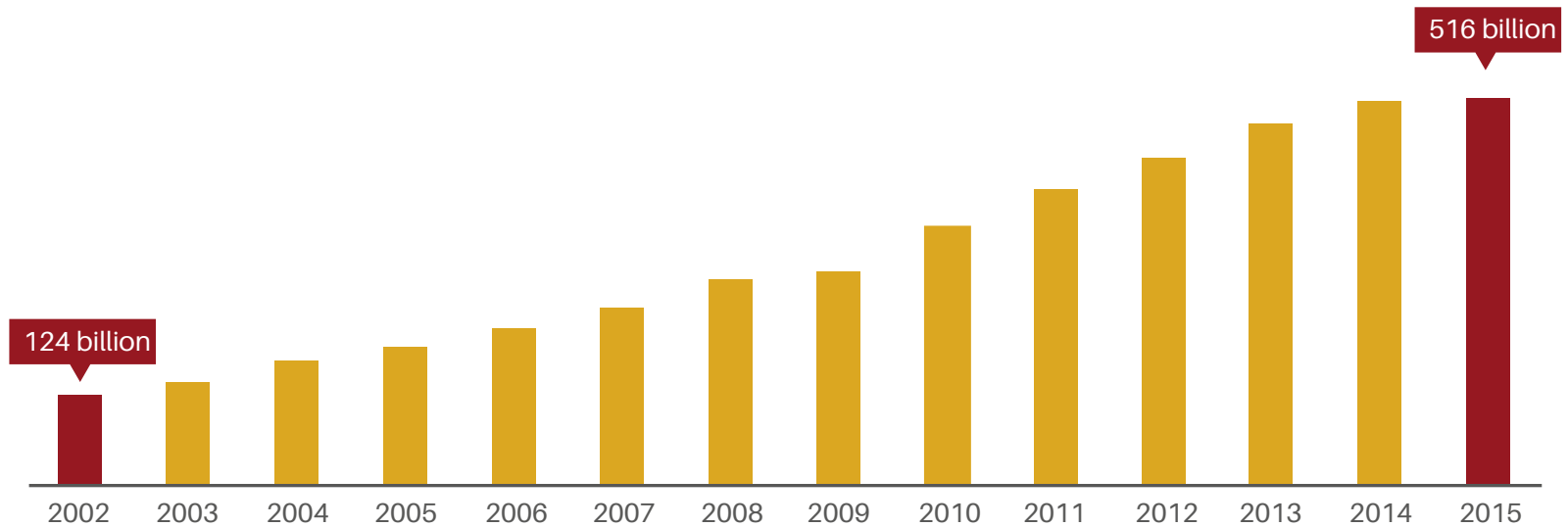
BRAZILIAN STATE SHARES IN VEHICLE LICENSING



Source: Own elaboration based on ANFAVEA data (2017)

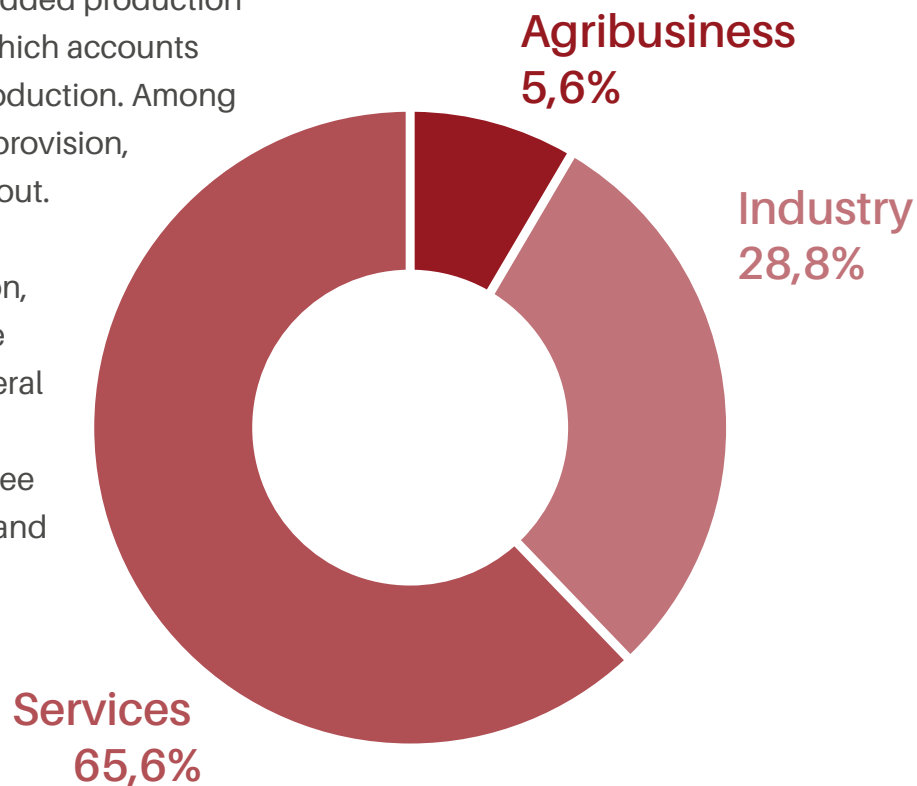
Between **2002** and **2015**
the State of **Minas Gerais** had a
GDP **growth of about 316%**

GDP CURRENT PRICES (R\$ BILLION)

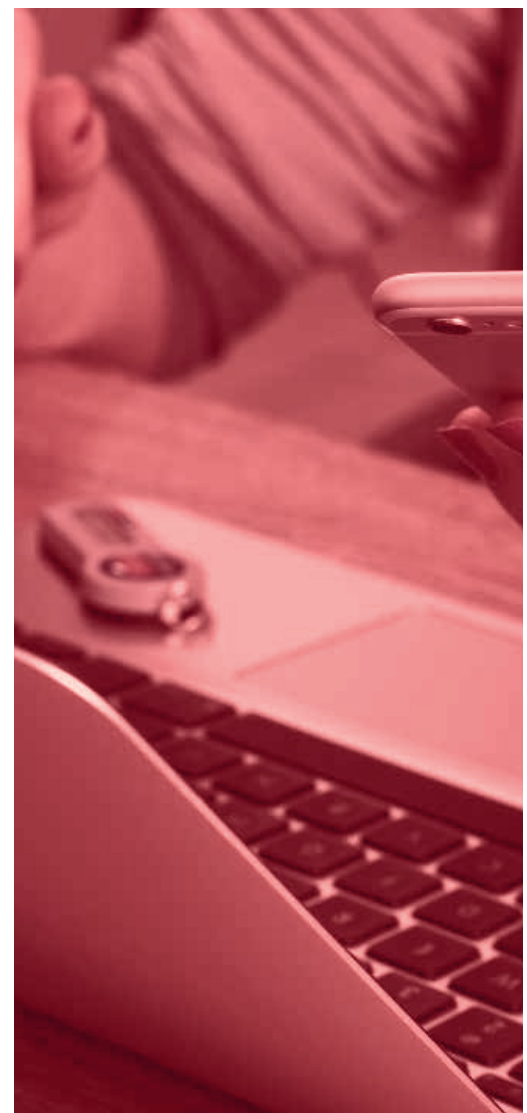


Sources: CEI-FJP/IBGE, 2015, Minas Part Desenvolvimento estimates.

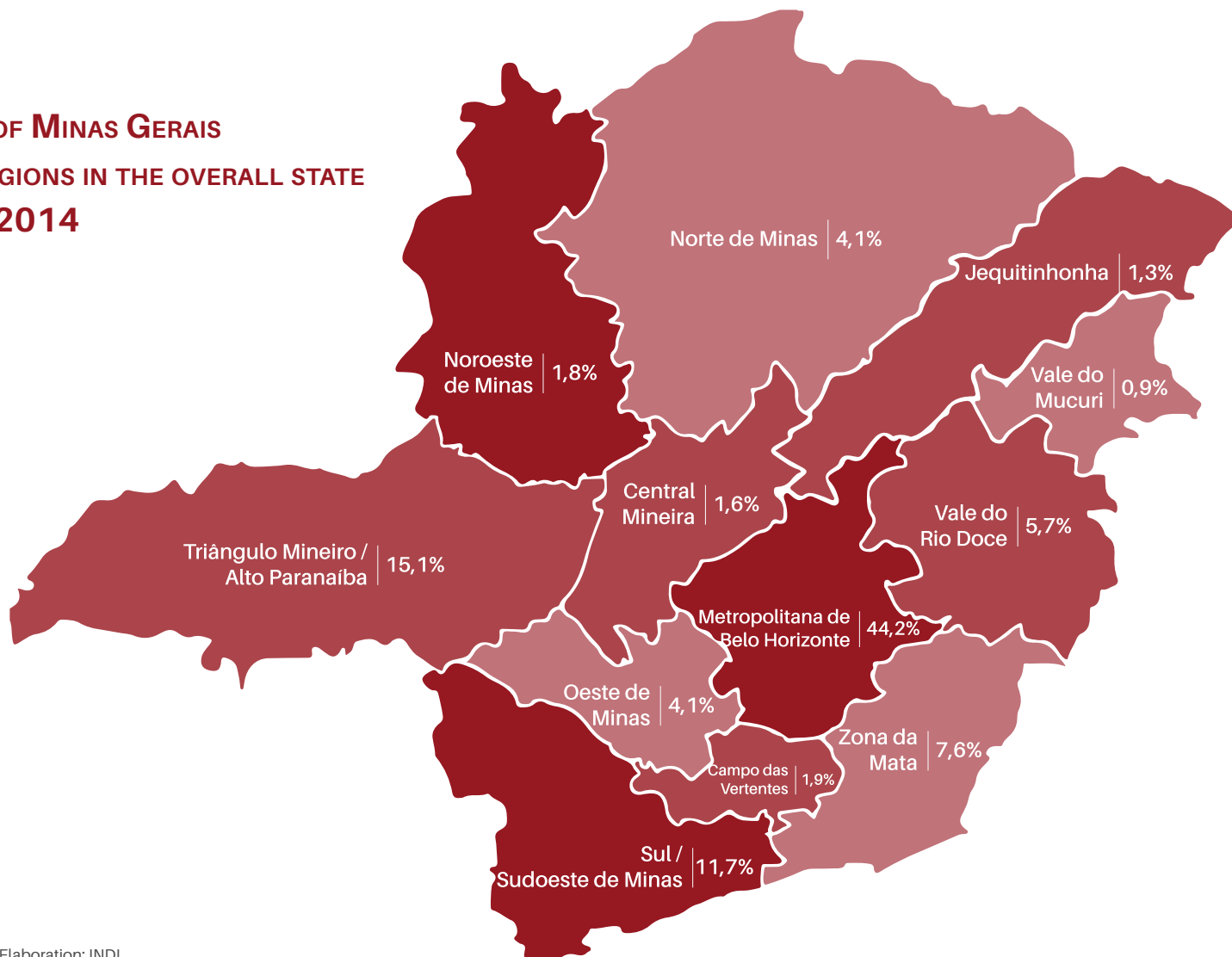
The largest part of state's value added production comes from the service sector, which accounts for more than 65% of the total production. Among services, those related to health provision, education and commerce stand out. Industry is responsible for more than 28% of the state's production, with a particular emphasis on the transformation industry and mineral extraction. In agriculture, grain-producing activities, such as coffee and soy, as well as cattle raising and a milk production stand out.



Source: Own elaboration based on FJP data (2016)



SHARE OF MINAS GERAIS MESOREGIONS IN THE OVERALL STATE GDP - 2014



Source: IBGE. Elaboration: INDI.

SOUTH/SOUTHWEST
Coffee
Agribusiness
Food Products
Automotive and automotive parts
Textile
Electronics
Non-metallic minerals
Cargo transport
Tourism
Helicopters

NORTHWEST
Agribusiness (cattle, soy)
Mineral extraction (iron, aluminium, tin)
Petroleum Coke, petrol. & by-products

VALE DO RIO DOCE
Steel Industry
Metal Products
Agribusiness
Food Products
Paper and Cellulose
Metallurgy (pig iron and precious minerals)

METROPOLITAN AREA OF BELO HORIZONTE
Metallic mineral extraction
Automotive and automotive parts
Metallurgy: pig iron, foundry, laminated steel
Construction industry
Life sciences
Information and Communication Technology (ICT)
Food & beverage
Tourism

VALE DO MUCURI
Cattle Raising
Food Products
Petroleum Coke, petrol. & by-products
Ethanol
Cargo Transport

CENTRAL MINEIRA
Agribusiness (cattle)
Forestry production
Food production (dairy)
Textile
Metallurgy: Non-ferrous metals and their alloys

TRIÂNGULO MINEIRO E ALTO PARANAÍBA
Agribusiness (cattle, poultry and coffee)
Cargo Transport
Sugar and Ethanol
Food products
Chemical products
Wholesale

NORTH
Agribusiness (cattle, fruit)
Forestry production
Textiles
Food products
Metallurgy (pig iron and non-metallic minerals)
Ferroalloys

ZONA DA MATA
Clothing manufacturing
Food Products
Wood Furniture
Cattle and Pig breeding
Textile
Metal Products
Cargo Transport

OESTE
Cattle Raising
Food Products
Iron and Steel foundry
Ethanol
Cargo Transport
Non-metallic minerals
Metallurgy
Leather and footwear
Clothing manufacturing

CAMPO DAS VERTENTES
Agribusiness
Food Products
Leather and Footwear
Non-metallic minerals
Cargo Transport
Automotive Parts

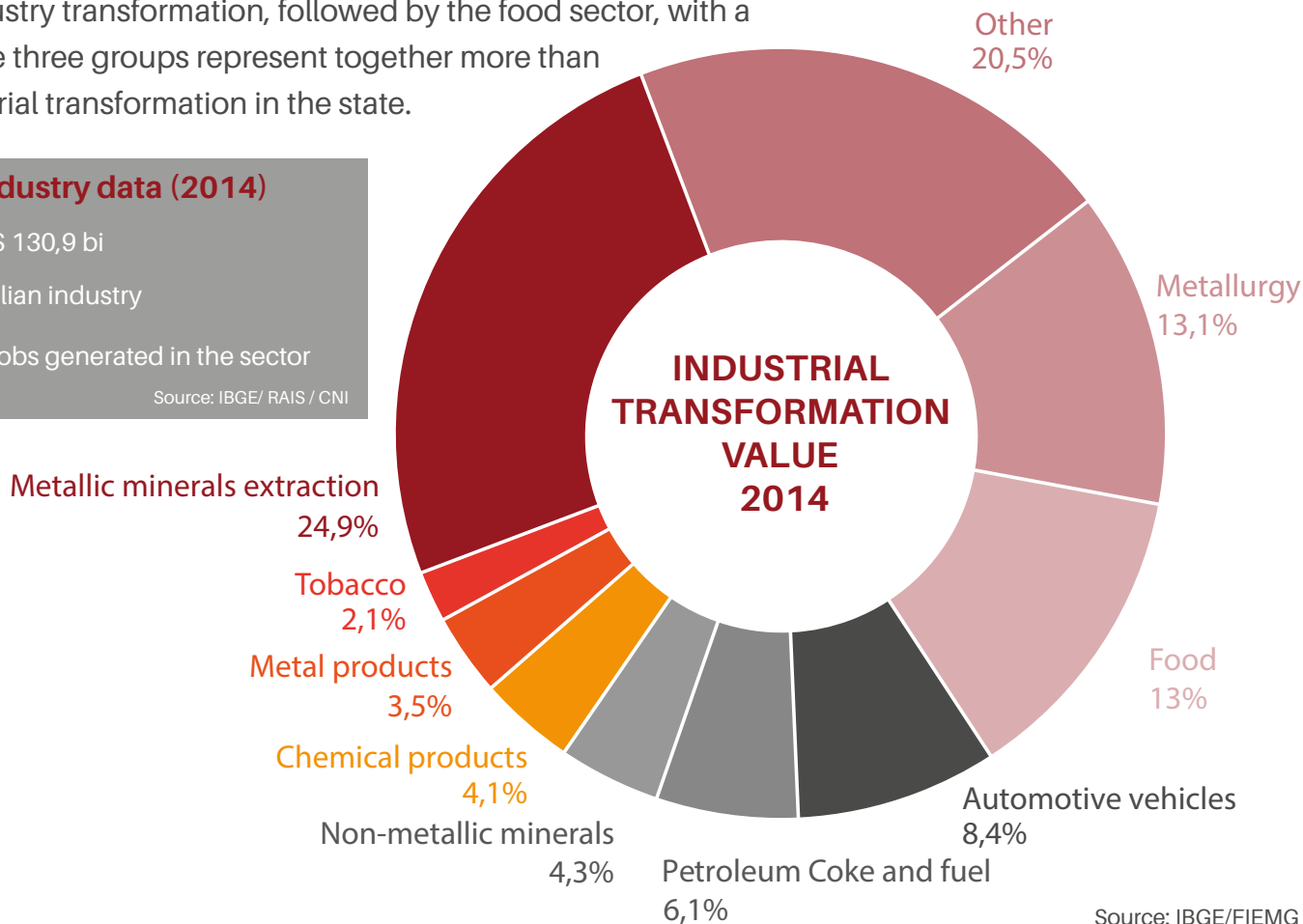
JEQUITINHONHA
Agribusiness (cattle, coffee)
Forestry production
Precious and ornamental stones
Non-metallic mineral extraction and products

Regarding the industrial transformation value in Minas Gerais, there is a strong presence of metallic mineral extraction, such as iron and niobium, with nearly a 25% share in 2014. Noteworthy as well is metallurgy, with 13.1% of the industry transformation, followed by the food sector, with a 13% share. These three groups represent together more than half of the industrial transformation in the state.

Minas Gerais industry data (2014)

- Industrial GDP: R\$ 130,9 bi
- 11,1% of the Brazilian industry
- Over 1,2 million Jobs generated in the sector

Source: IBGE/ RAIS / CNI



Source: IBGE/FIEMG

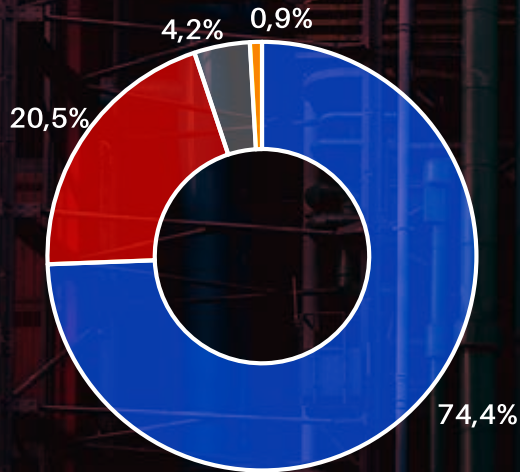
More than 12% of the Brazilian industries are located in Minas Gerais, what made for 64 thousand companies in the state in 2015. More than 39% of the industrial employees work for large companies (those which employ over 250 people).

INDUSTRY ENTERPRISES SIZE

64.320 industrial companies in the state in 2015

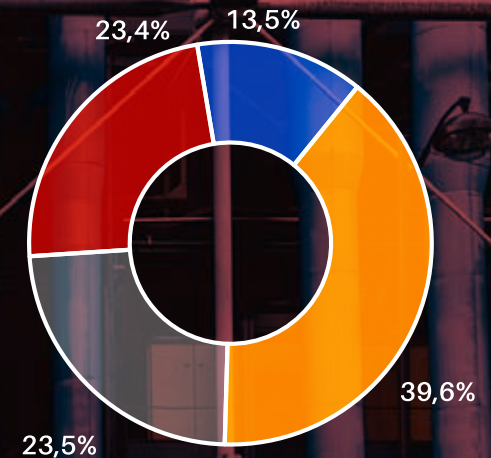
12,6% of all industrial companies operating in Brazil

INDUSTRY ENTERPRIZES SHARE BY SIZE



-  **Micro Enterprises**
up to 9 employees
-  **Small Enterprises**
10 to 49 employees
-  **Medium Enterprises**
50 to 249 employees
-  **Large Enterprises**
250+ employees

INDUSTRY ENTERPRIZES SHARE BY INDUSTRIAL EMPLOYMENT



Source: CNI



Minas Gerais has over 21 million inhabitants, about 10% of the Brazilian population. Nearly 85% of them live in the urban areas of the 853 municipalities of the state.

In 2015, Belo Horizonte's Metropolitan Area (RMBH), consisting of 34 municipalities, had a population of over 5.87 million inhabitants, of which 2.5 million live in Belo Horizonte, the capital.

There are 13 municipalities in the state with over 200 thousand inhabitants and 16 between 100 and 200 thousand.

The state's HDI is considered high according to UN standards and life expectancy, over 76 years, is above the Brazilian average.

Description	Minas Gerais	Brazil	MG/BR (%)
Area (km ²)	586,528.29	8,514,876.60	7.0
Population 2016* (million inhabitants)	21.0	206.1	10.2
Rate of urbanization 2014 (%)	84.6%	85.1%	--
Economically Active Population - EAP 2015 (million inhabitants)	10.8	101.4	10.7
Employed population 2015 (million inhabitants)	9.8	92.3	10.6
Medium size families 2013	2.8	3.0	--
Population density 2015 (inhab./km ²)	35.6	24.0	--
Life expectancy at birth - 2015 (years)	76.7	75.2	--
Human Development Index - 2010 (HDI)	0.731	0.727	--
Birth rate (births/1,000 persons) - 2014	15.1	14.79	--
Total fertility rate - 2014 (children/woman)	1.6	1.74	--
Population-growth rate - 2016*	0.62	0.8	--

*Estimate

Sources: IBGE/FJP

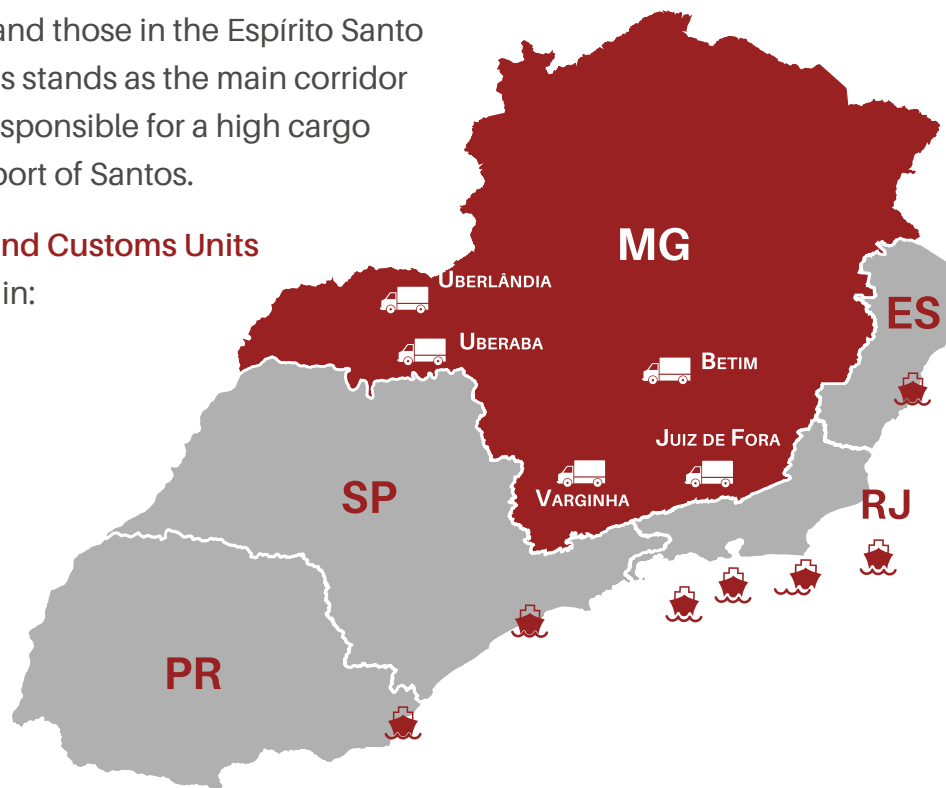
Minas Gerais boasts a privileged location in Brazil, being in the center of the Brazilian Southeast Region, connecting the Center-West (by the frontiers with Goiás and Mato Grosso do Sul) and the Northeast (frontier with Bahia) to the states of São Paulo, Espírito Santo and Rio de Janeiro. That allows easy access to the main Brazilian ports, such as Santos (SP), Rio de Janeiro (RJ), Paranaguá (PR), and those in the Espírito Santo Port Complex. Therefore, Minas Gerais stands as the main corridor connecting these states, which are responsible for a high cargo land transport, especially due to the port of Santos.

In addition, Minas Gerais has **five Inland Customs Units** (EADI), known as “dry ports”, located in:

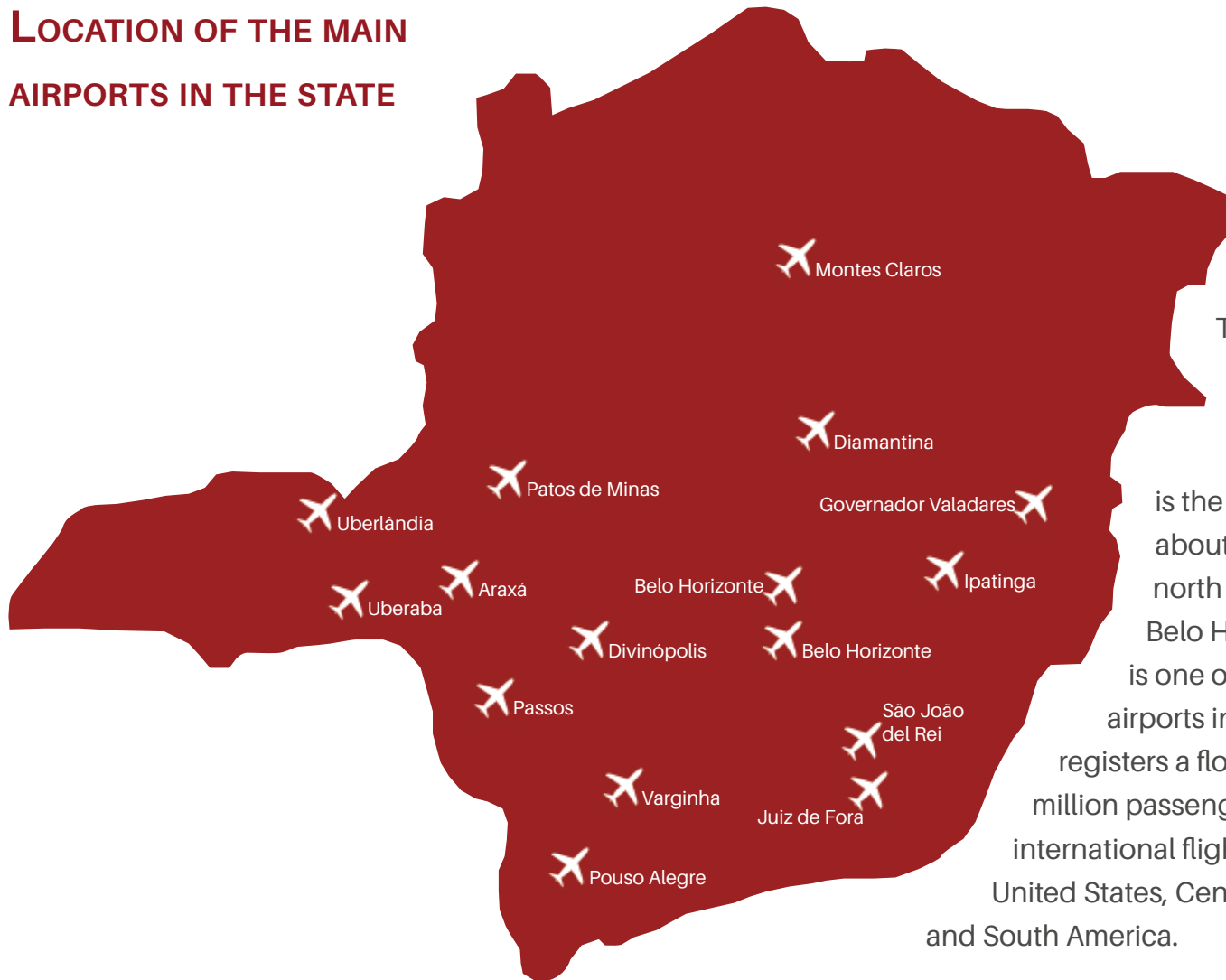
- ✧ **Betim;**
- ✧ **Juiz de Fora;**
- ✧ **Uberaba;**
- ✧ **Uberlândia;**
- ✧ **Varginha.**

The main advantage of those structures is the speed in the customs clearance process.

LOCATION OF THE MAIN PORTS IN THE SOUTHEAST REGION



LOCATION OF THE MAIN AIRPORTS IN THE STATE



The most important airport of Minas Gerais is the BH Airport, about 40 kilometers north of downtown Belo Horizonte. It is one of the top five airports in Brazil and registers a flow of over 10 million passengers/year, with international flights to Europe, United States, Central and South America.

Minas Gerais has the **largest road network** and the **second largest rail network** in Brazil.

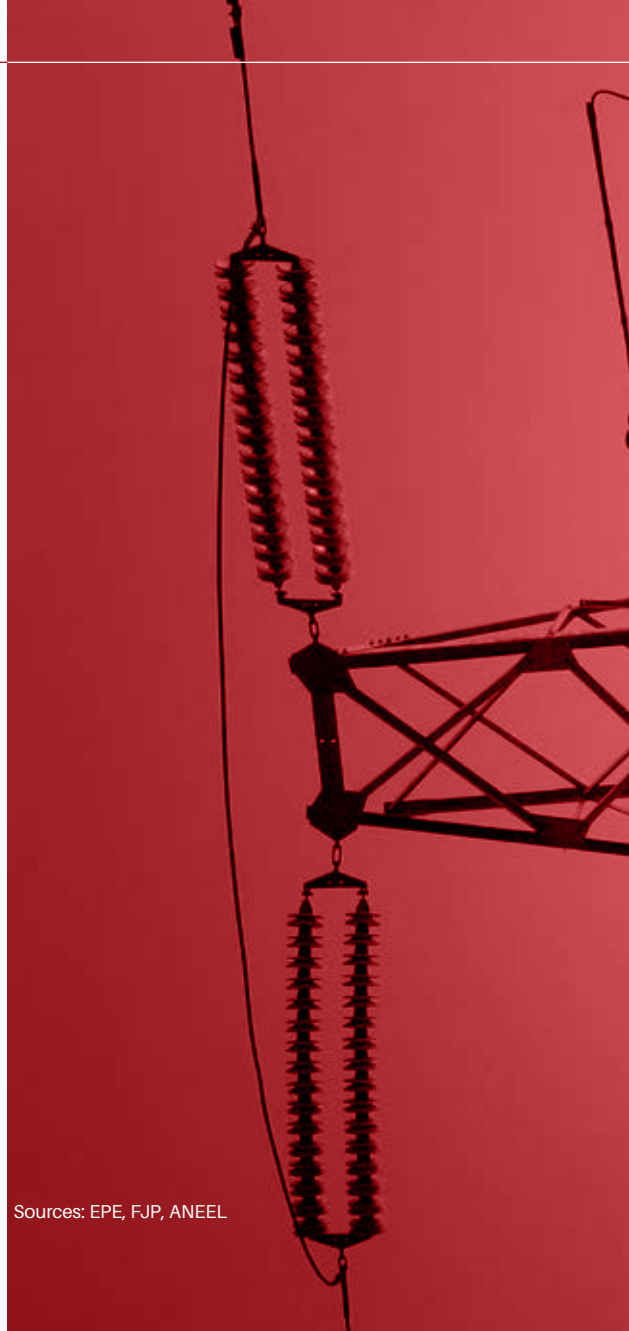
Natural Gas: Controlled by CEMIG and the municipality of Belo Horizonte, GASMIG distributes about 4 million m³/day of natural gas to all major industrial centers of Minas Gerais.

Sanitation: COPASA is the second largest sanitation service provider in Brazil and is nationally renowned for the quality of its work.

The state's industries consume more than 16% of Brazil's industrial energy, supplied mainly by the Minas Gerais energy Company (Companhia Energética de Minas Gerais - Cemig).

Infrastructure	MG	Brazil	MG/BR (%)
Energy-Installed capacity 2017 (MW)	15,801	151,576	10.42
Energy-Generation 2015 (GWh)	37,695	581,486	6.48
Energy-Industrial Consumption 2015 (GWh)	27,143	168,854	16.07
Energy-Total Consumption 2015 (GWh)	51,810	465,203	11.13
Paved Highway 2015 (km)	29,973	211,468	14.17
Railway 2015 (km)	5,329	29,706	17.93

Sources: EPE, FJP, ANEEL









Economy

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AGRIBUSINESS

in Minas Gerais has as a main feature its plurality.

The diversity of climate, soil and terrain fosters the establishment of a variety of businesses in many fields of economic activity.

Minas Gerais is the largest milk producer in Brazil, accounting for 26.7% of the national production in 2014 (IBGE). Milk processing and the production of dairy products take place in over 700 dairy plants scattered around the state. Some of the sector's main industries are located here, such as Danone, Itambé, Embaré and Cemil.

As for grains, corn and soy represent 89.4% of the total grain production in the state, around 13.3 million tons (SEAPA).

Coffee was responsible for 47.9% of the state's agribusiness exports and represented 58.3% of the national production in 2016 (MDIC; IBGE/SEAPA-MG). Growing conditions in southern Minas Gerais make the region the main coffee producer in Brazil. According to the Brazilian Specialty Coffee Association, the state presents the biggest concentration of specialty coffee producing regions.

In 2014, 260 thousand jobs were created in the agribusiness sector in Minas Gerais (Dataviva/Rais)



Coffee
47,9%

Forestry products
7%

Sugar and ethanol
16%

Other
4,7%

Soy complex
12,5%

Leather and leatherwork
1,4%

Meat
10,5%

Source: Aliceweb - MDIC/ Seapa

Highlights in Minas Gerais:

National 1st place in:

- ☞ Coffee production and exportation
- ☞ Milk production
- ☞ Potato production
- ☞ Horse herd
- ☞ Zebu genetics – largest hub in the world

National 2nd place in:

- ☞ Cattle herd
- ☞ Sugar production
- ☞ Bean production

And also 3rd largest sugar cane and ethanol producer.



Also noteworthy is the Cândido Tostes Dairy Institute, which since 1935 gives decisive contribution to the permanent growth of the Brazilian dairy industry, developing and sharing technology, as well as training technicians and personnel for both the industry and related activities.

POLO DE EXCELÊNCIA
EM GENÉTICA
BOVINA

Minas Gerais is home to Scientific and Technological Institutions (ICTs) reference in animal and vegetal genetic improvement. The Federal University of Viçosa (UFV) develops projects in the Vegetabel Science field, such as agricultural genetic improvement. The city of Uberaba is home to the Center of Excellence for Bovine Genetics in the Brazilian Zebu Breeders Association (ABCZ).

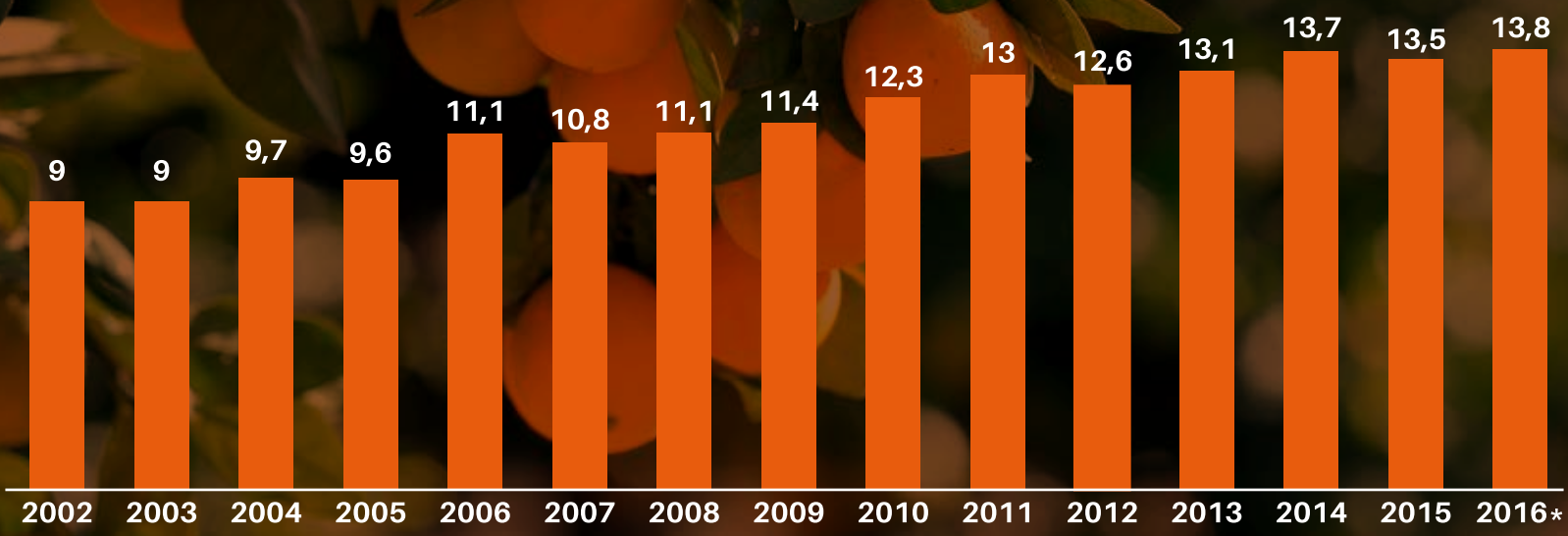
SHARE OF MINAS GERAIS IN BRAZILIAN AGRIBUSINESS GDP

* data published in March 2017 referring to December 2016.
Source: CEPEA-USP, FAEMG/SEAPA



MG
204,4

Other states
1.276,8





FOOD AND BEVERAGE

Minas Gerais has a very diversified beverage sector as well, producing cachaça (Brazilian rum spirit), beer, soft drinks, energy drinks and juices, among others.

- ✧ **AMBEV** – 4 plants in the state and a factory in Uberlândia, projected to be the world’s largest
- ✧ The **FEMSA Coca-Cola** factory in Itabirito is the group’s most modern facility
- ✧ **Nestlé** – the first plant outside Europe to use the exclusive technology to make NESCAFÉ® Dolce Gusto® coffee capsules, using 100% Brazilian coffee, as well as other national raw materials, like milk, cocoa and sugar.
- ✧ Renowned cachaça producers, like **Salinas**, **Vale Verde** and **Caribé**.
- ✧ A significant number of breweries, such as **Wäls**, **Bäcker**, **Falke Bier**, **Krug Bier** and others.

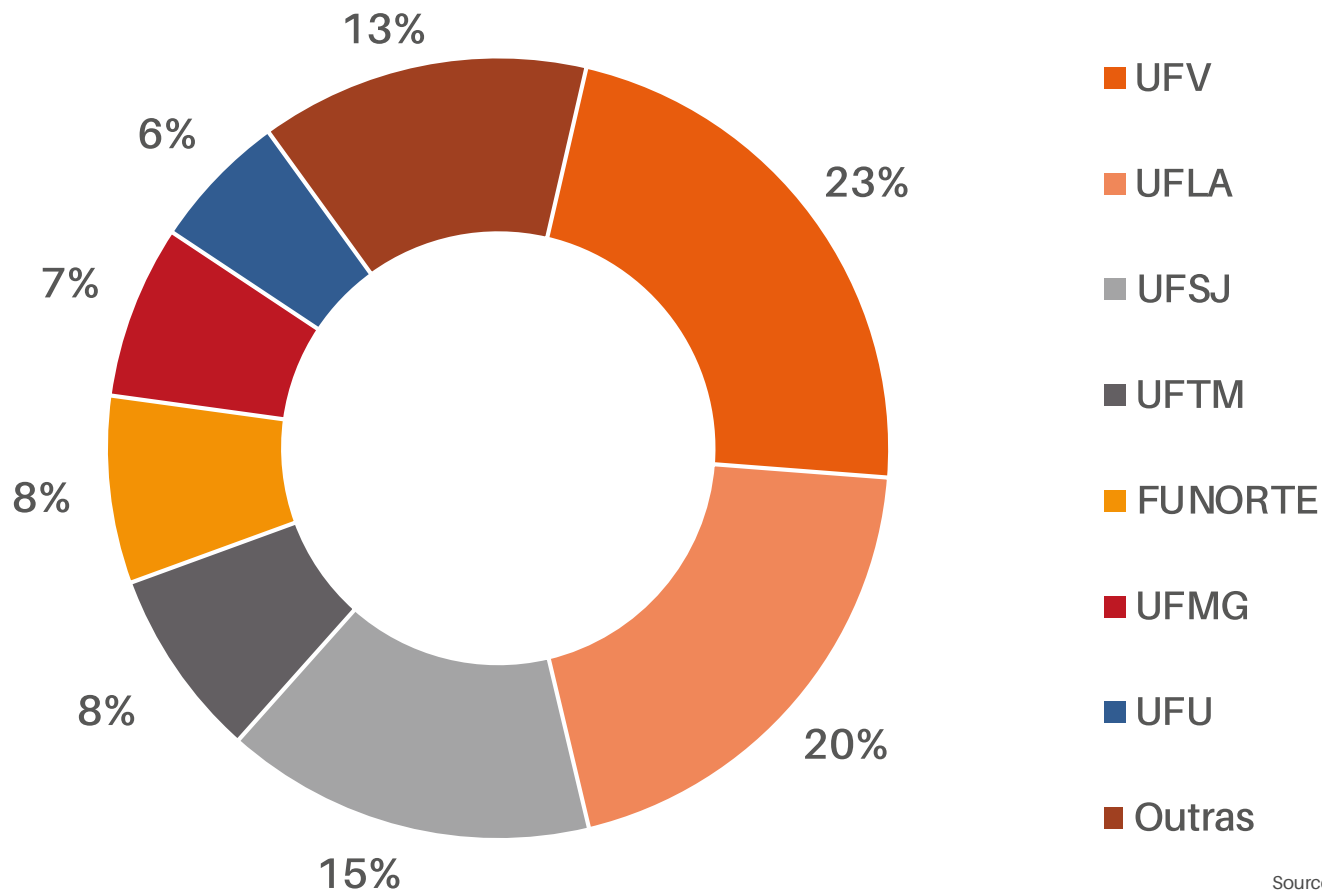
The state is also home to a variety of companies in the food sector (which is itself very diversified) producing non-processed, little-processed and highly processed food. There are hundreds of companies in the state, such as:

- ✧ Algar,
- ✧ Bauducco/Pandurata,
- ✧ Barry Callebaut,
- ✧ Cargill,
- ✧ Danone,
- ✧ Ferrero,
- ✧ Kopenhagen,
- ✧ PepsiCo,
- ✧ Unilever,
- ✧ Yoki.

The Federal University of Viçosa (UFV) has the largest number of students enrolled in the course of Food Engineering in the state, and the Federal University of Juiz de Fora (UFJF) has the largest number of students enrolled in Nutrition.

UNIVERSITIES OFFERING COURSES IN FOOD ENGINEERING IN MINAS GERAIS (2014)

Enrolled: 2,04 thousand students.



Source: DataViva/MEC



MINING

- ❖ Large production in *iron ore, gold, zinc, phosphate and niobium* (75% of the world production of niobium)
- ❖ Largest national producer of *graphite and lithium*
- ❖ One of the main national producers of *limestone*
- ❖ More than *300 mines operating* in the state
- ❖ Responsible for *53% of metallic minerals' production of brazil* and *29% of overall national minerals' production*
- ❖ The state has *40% of biggest mines in brazil*
- ❖ *67% of brazilian mines* with over 3 million tons/year production

Source: IBRAM 2014

Barite
Basalt
Diamond

Gold
Lead
Limestone

Niobium
Phosphate
Rare Earth Elements
Zinc



Diamond
Feldspar
Gemstones

Gold
Granite
Graphite

Kaolin
Limestone
Mica

Lithium
Quartz
Quartzite

Agalmatolite
Aluminum
Emerald
Gold
Granite

Iron Ore
Kaolin
Limestone
Manganese

Marble
Mineral Water
Phyllite
Quartz

Quartzite
Slate
Talcum
Topaz

EDUCATION

BEST BRAZILIAN PUBLIC UNIVERSITIES  4 among the top 10
 7 among the top 25

Number of graduating courses in related areas:

Mining Engineering **15** Metallurgical Engineering **10** Geology **6**

Master Degree in related areas **52 programs**

Doctorate in related areas **29 programs**

Some Mining Companies Stablished in Minas Gerais

-  Anglo American
-  BHP Billiton
-  Kinross
-  AngloGold
-  CBMM
-  Vale
-  Arcelor Mittal
-  Jaguar Mining
-  Yamana Gold



METAL AND STEEL INDUSTRY

Minas Gerais has the most important steel industry in Latin America (largest Brazilian steel, pig iron and ferroalloys producer) and counts with some of the main companies operating in Brazil. To strengthen this cluster there are also teaching institutions, such as UFMG and UFOP, as well as equipment suppliers for the sector.

The importance of this production chain is also visible in the economy of the state, where it is responsible for substantial amounts of ICMS (a state tax) and jobs created in regions such as Central, Vale do Aço, Vale do Rio Doce e Zona da Mata.

No.1 STEEL PRODUCER

32.1% of the national crude steel production in 2015

No.1 CEMENT PRODUCER

20.85% in 2013

No.1 ZINC PRODUCER

100% of the national production

No.1 SLATE AND PRECIOUS STONES PRODUCER

90% of the national production

No.2 AUTOMOTIVE HUB IN BRAZIL

15.4% in 2016 (vehicle manufacturing, automotive parts, trucks, tanks, comercial vehicles and tractors)

Sources: Anfavea, DNPM, Instituto Aço Brasil, SNIC.

INDUSTRIAL PRODUCTION – SELECTED PRODUCTS

Specifications	Brazil	Minas Gerais	MG/BR (%)	Ranking
Processed iron ore 2014 (millions of tons)	411	281.7	68.5	1st
Pig iron 2014 (millions of tons)	5.35	2.9	54.4	1st
Crude steel production (millions of tons)	34	11	32.7	1st
Cement 2013 (millions of tons)	70	14.6	20.8	1st
Gold 2014 (tons)	81	37.7	46.5	1st
Locomotives (2016)	109	109	100	1st
Helicopters (2015)	12	12	100	1st
Niobium (2014) (tons)	88,7	79,8	89.9	1st
Vehicles 2016 (thousands)	2,175	334.95	15.4	2nd
Zinc (millions of tons)	170	170	100	1st

The Minas Gerais transformation industry is the second largest in the country, representing 11.1% of the Brazilian industrial GDP (2014).

AUTOMOTIVE AND TRANSPORT

Minas Gerais is home to the 2nd largest automotive hub in Brazil, with 15.4% of the national production in 2016. It has a consolidated production chain and is also a great producer of primary material for the automotive industry.

The state is an important producer of transport material as well:

- ✧ Only helicopter factory in South America.
- ✧ Only locomotive production plant in Brazil

MAIN DOMESTIC MARKETS (VEHICLE LICENSING)

State	2015	2016
São Paulo	26,8%	26,8%
Minas Gerais	13,2%	16,3%
Rio de Janeiro	7,7%	7,1%
Paraná	7,5%	7,2%
Rio Grande do Sul	6,1%	6,0%

Source: Anfavea (2017)

THE SECTOR'S MAIN PLAYERS IN THE STATE ARE:

- ✧ FCA (Fiat)
- ✧ XCMG
- ✧ Landini
- ✧ Iveco
- ✧ Helibrás
- ✧ GE Transportation (locomotives)
- ✧ Mercedes-Benz
- ✧ CNHi
- ✧ EMD (locomotives - CaterpillarGroup)

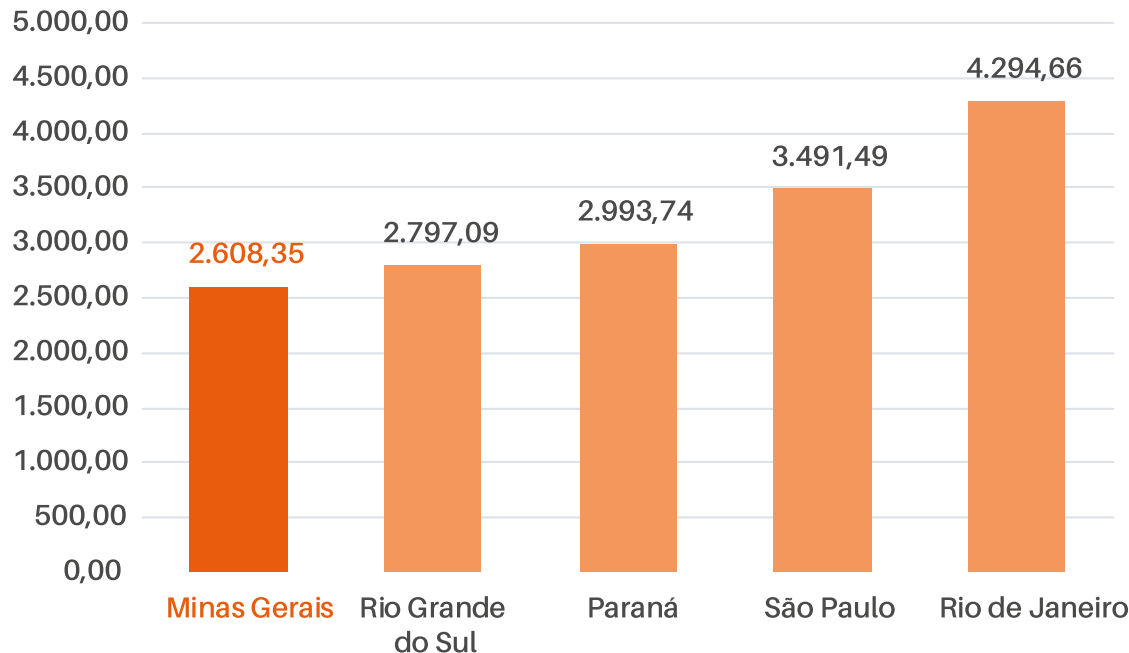
The state has 72 companies affiliated to the National Union of Automotive Components Industries (SINDIPEÇAS) - more than double the size of the 3rd place.

Minas Gerais Shares	
Revenue	12,7%
Employees	14,9%
Business units	11,5%
Exports	10,5%
Imports	6,3%

Source:
Sindipeças (2015)

STATE COMPETITIVENESS RANKING

AVERAGE WAGES IN THE MECHANICAL INDUSTRY (IN R\$)



Source: RAIS, 2015

AEROSPACE

The aerospace industry in Minas Gerais stands out both nationally and internationally due to the presence of higher education institutions and also big companies such as Embraer, Helibras, IAS, GOL and Azul. Through initiatives that gather research institutes, universities, industry and government, the state is set on strengthening its competitive advantages in the sector.

Minas Gerais is home to the only helicopter factory in Latin America.

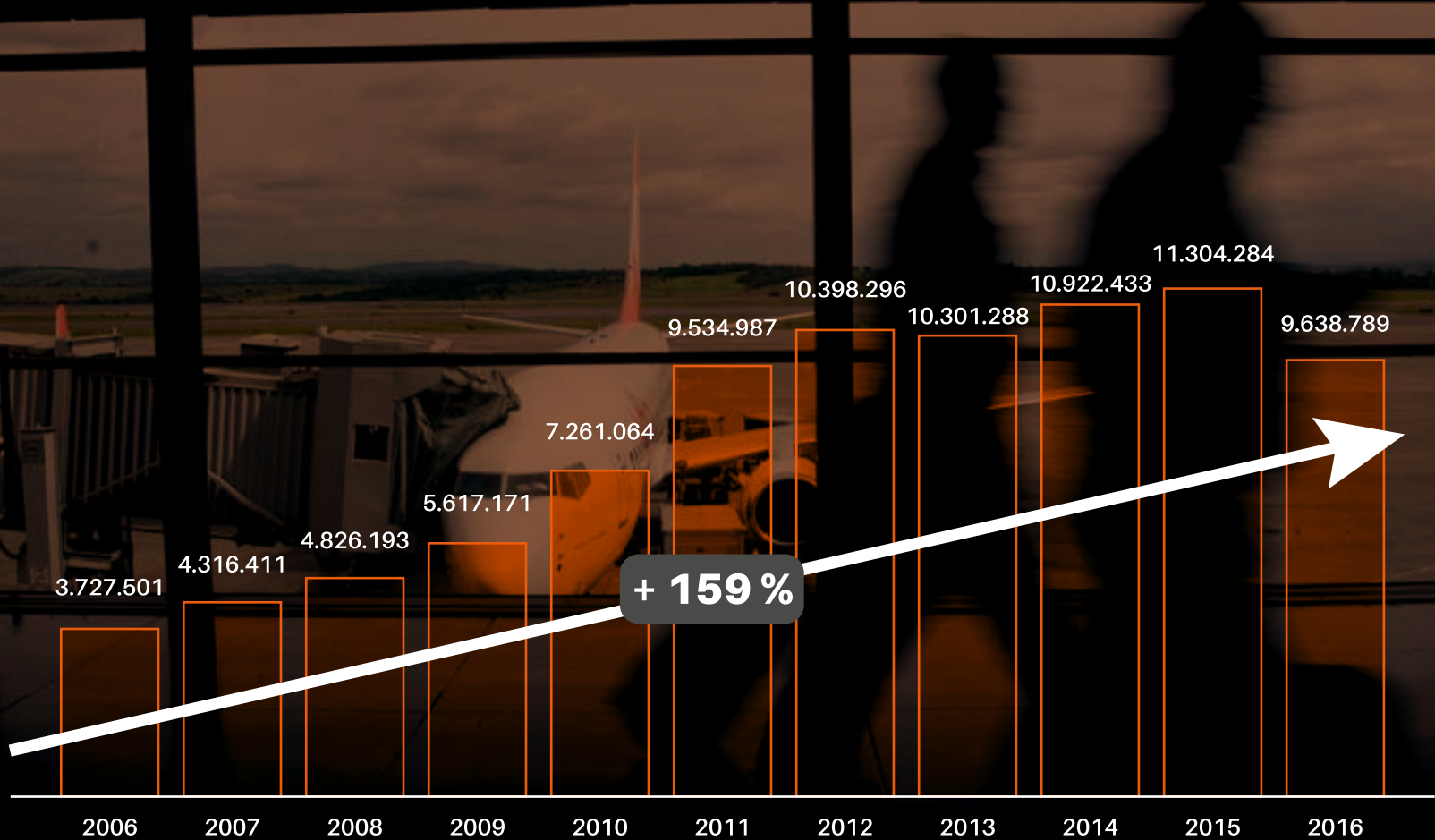
The Tancredo Neves International Airport, in the city of Confins, is the state's main airport and also one of the busiest in Brazil, reaching 11.3 million passengers in 2015. With a R\$ 1.5 billion investment in the next decade, BH Airport (the concessionary company responsible for the airport administration) intends to increase its capacity by 22 million passengers a year.

WORKFORCE

In Minas Gerais, many institutions provide qualified professionals every year to the aerospace sector. There are, for instance, courses in aerospace engineering at UFMG and FUMEC, both in Belo Horizonte. The Federal University of Itajubá offers a course in aerospace mechanical engineer, dedicated to helicopter manufacturing. In addition to those higher education institutions, SENAI-MG also offers a technical course in aircraft maintenance.

In 2015, UFMG students and professors developed in class the fastest plane on Earth.

EVOLUTION OF PASSENGER GROWTH - % BH Airport (Confins)



LIFE SCIENCES

2nd largest Brazilian hub

Biotechnology and Life Sciences

Over 200 biotechnology and life sciences companies

Over 400 companies in the human health chain (Anbiotec)

Source: Biomínas

The first biotechnology company in Brazil (Biobrás) was founded in Minas Gerais in the 1970s, and later acquired by Novo Nordisk in 2001.

Today, the group counts with dozens of companies born in Minas and many other multinational companies, such as ACG Worldwide, GE Healthcare, Novo Nordisk, Philips VMI and St Jude Medical.

They work with in vitro diagnosis, medical appliances, vaccines, bone reconstruction material and other fields. (BIOMINAS, 2014).

Companies from the Minas Gerais sell human health products and services, and also provide solutions in the agribusiness field, in areas such as animal health, reproduction, molecular diagnosis and vaccine production.

The concentration of teaching, research and professional formation institutions stands out in the state, which is ranked 2nd in the number of graduate programmes in life sciences (171 in total). In addition, some courses are nationally and internationally recognised (Capes grades 5, 6 and 7),

Business Environment





according to the classification set by Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (Capes) (Geocapes/ Biominas, 2016)*

Besides a variety of universities and other teaching institutions, the state also has the experience of the Ezequiel Dias Foundation (FUNED) and the René Rachou Research Center (CPqRR/Fiocruz Minas).

***Note:** According to the parameters set by Capes, grades 6 and 7 correspond to international quality courses and 5 to excellence at national level. FUNED is aligned with the Brazilian national health system (SUS) for the production of currently imported drugs and takes part in a few partnerships with private companies. It also has a modern 2,500 square metre biotechnology plant .

Laboratory Analysis:

- ❖ Tests to measure the quality of: water for human consumption, cosmetics, medicine, cleaning materials and ambient air quality.
 - ❖ Proficiency tests;
 - ❖ Analyses in biologic material for disease control;
 - ❖ Water and food monitoring;
 - ❖ Haemodialysis quality-monitoring services;
- and several other services such as research, development and innovation in health, science and technology.



RENEWABLE ENERGY

CEMIG, the largest integrated company in the electrical energy sector in Brazil has prepared a detailed study of the potential for renewable energy in the state. Solar incidence and radiation, geographical conditions and territorial extension make Minas Gerais perfect for solar energy generation.

MINAS GERAIS PROGRAM FOR RENEWABLE ENERGY

Programa Mineiro de Energias Renováveis
Energias de Minas/Energy of Minas

Pioneer in Brazil, this program aims at promoting both the production and consumption of renewable energy, bolstering the state's position as a national reference center in clean energy.

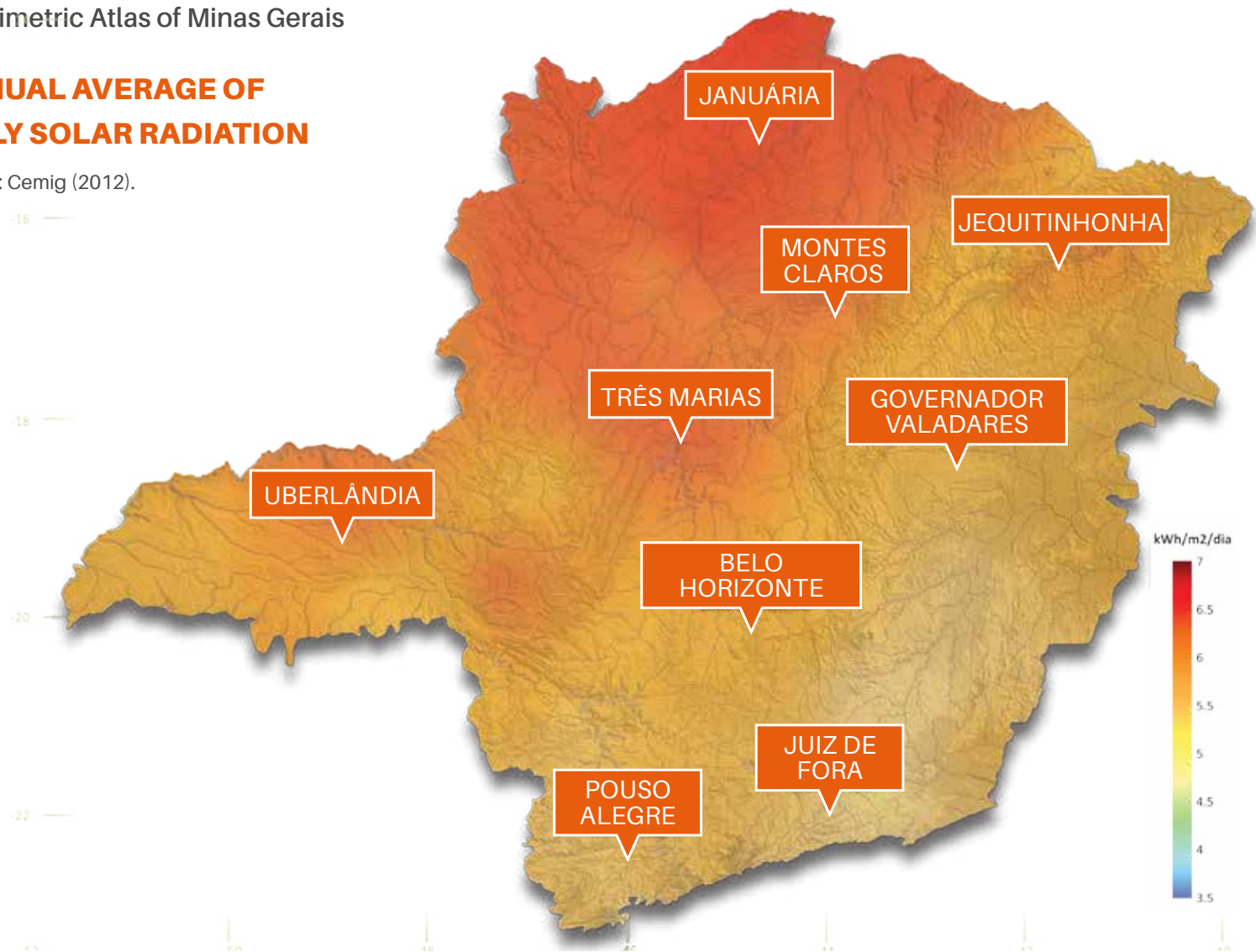
The programme covers:

- ✧ Various types of energy: solar, wind, biomass, biogas, and hydraulic
- ✧ Low rates for equipment purchasing
- ✧ Special tax regime for the generation of renewable energy
- ✧ Special financing line
- ✧ Capital and technology formation for the sector

Solarimetric Atlas of Minas Gerais

ANNUAL AVERAGE OF DAILY SOLAR RADIATION

Source: Cemig (2012).



INFORMATION AND COMMUNICATION TECHNOLOGY

- ✧ Home to about 5 thousand companies.
- ✧ Annual revenue: R\$ 2.4 billion
- ✧ Direct jobs involved: about 33 thousand
- ✧ 25 incubators for technology-based companies connected to the Minas Gerais Innovation Network (Rede Mineira de Inovação - RMI)
- ✧ Approximately 159 companies undergoing incubation process

Source: Rede Mineira de Inovação (RMI)



Renowned as one of the best universities in the country, the Federal University of Minas Gerais (UFMG) helps provide qualified professionals in Belo Horizonte with its course in computer science.

Another hub of technological development in the state is the city of Santa Rita do Sapucaí, where the National Telecommunications Institute (INATEL) offers undergraduate and graduate courses in engineering, telecommunications and information technology.

The state has a total of 29 higher education institutions offering courses in computer engineering:

- ✧ 18 institutions offering undergraduate courses in information systems
- ✧ 8 institutions offering MA in computer sciences
- ✧ 3 PhD courses

HARDWARE

Minas Gerais is home to two Data Center companies:

- ✧ Ativas counts with a 11,000 square metre built-up area following the latest international sustainability and energy efficiency standards
- ✧ Algar Tecnologia, with two Data Centers in Uberlândia



SOFTWARE

In Belo Horizonte there is an important technology hub organised in a development cluster: Software BH

Minas Gerais is home to important IT companies, most of them located in the metropolitan area of Belo Horizonte, but in other cities as well:

- ✧ Google has a Research and Development Center in Belo Horizonte, the only of this type in Latin America;
- ✧ SAP is strengthening its operations in the state and has already spotted the Triângulo region as strategic;
- ✧ Microsoft has a branch in Belo Horizonte, aimed at consolidating and increasing its partnerships in the area.

Other companies in the state are Algar Tech, Avenue Code, Infosys, Sankhya e Totvs.



Foreign Trade

✚ export development	55
✚ main exported products	56
✚ main imported products	57
✚ export markets 2018	58
✚ Import origins 2018	59

Minas Gerais is the second largest Brazilian exporter. In 2016 the state exported over US\$ 21 billion, an amount correspondent to 11.8% of total Brazilian exports.

EXPORT DEVELOPMENT (US\$ BILLION)



Source: MDIC

THE MAIN PRODUCTS EXPORTED IN 2016 WERE:

iron ore, with a 32% share, followed by **coffee, with 16%** and **metallurgical products, with more than 15%** of the total exported.

Products (NCM)	US\$ (2016)	Share %
Ore and other mineral products	7.100.569	32,39
Coffee	3.524.388	16,08
Metallurgical products	3.438.891	15,69
Ceramic material, precious stones and metals	1.542.372	7,04
Food products, beverage and tobacco	1.409.242	6,43
Vehicles and transport materials	931.158	4,25
Chemical products	790.638	3,61
Electrical and mchanical equipment	564.430	2,57
Paper and cellulose	504.869	2,30
Textiles, footwear, leather	198.480	0,91
Other	1.915.620	8,74
TOTAL	21.920.657	100

Source: Own elaboration based on data from MDIC.

MINAS GERAIS IMPORTED MORE THAN US\$ 6 BILLION IN 2016. MAIN PRODUCTS WERE:

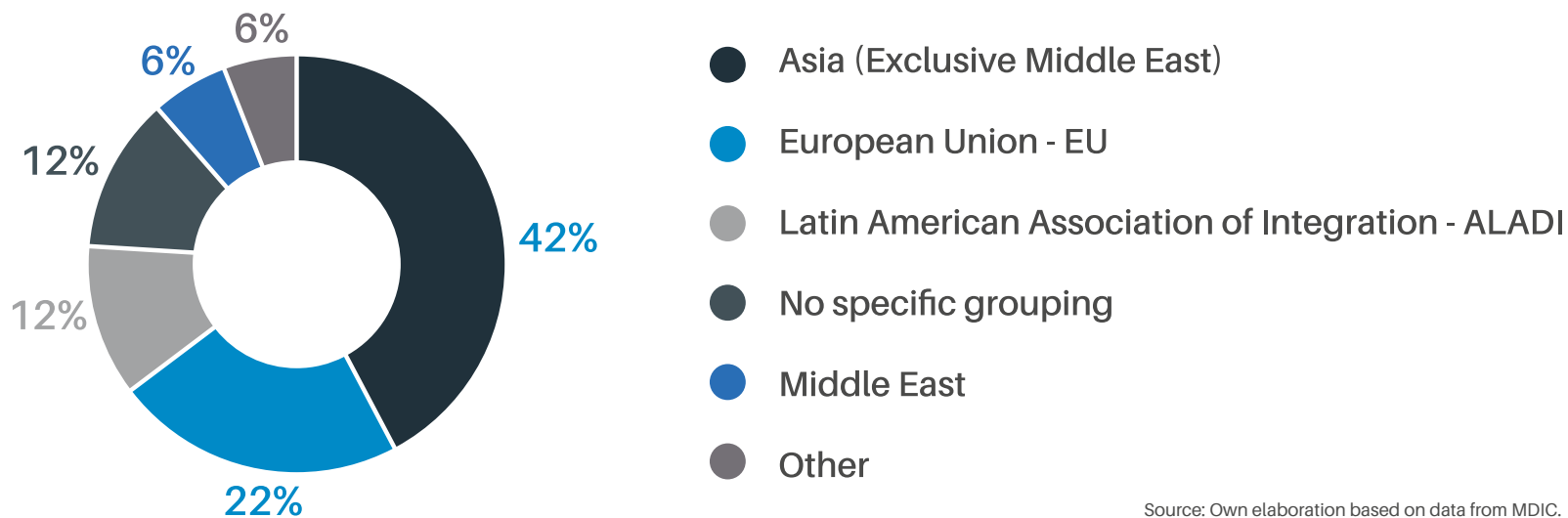
electrical and mechanical equipment, equivalent to **more than 33% of the total**, followed by **chemical products**, with **19%** and **vehicles and transport material**, with **9.8%**

Products (NCM)	US\$ (2016)	Share %
Electrical and mechanical equipment	2.164.359.705	33,02
Chemical products	1.248.655.158	19,05
Vehicles and transport material	642.755.771	15,69
Mineral ores and fuels	603.021.579	9,20
Manure and fertilisers	535.177.199	8,16
Food products, beverage and tobacco	226.490.766	3,46
Textiles, footwear, leather	156.071.595	2,38
Pharmaceuticals	112.150.133	1,71
Other	866.163.377	13,21
TOTAL	6.554.845.283	100

Source: Own elaboration based on data from MDIC.

The major amount of Minas Gerais exports are sent to Asia, outstanding China as the greatest consumer of iron ore and other metallic minerals.

Countries - export destinations (2016)	US\$ FOB	Share %
China	5.921.679.299	27,01
The United States	1.844.451.522	8,41
Argentina	1.244.224.508	8,68
Japan	1.153.584.440	5,26
The Netherlands (Holland)	1.107.367.126	5,05

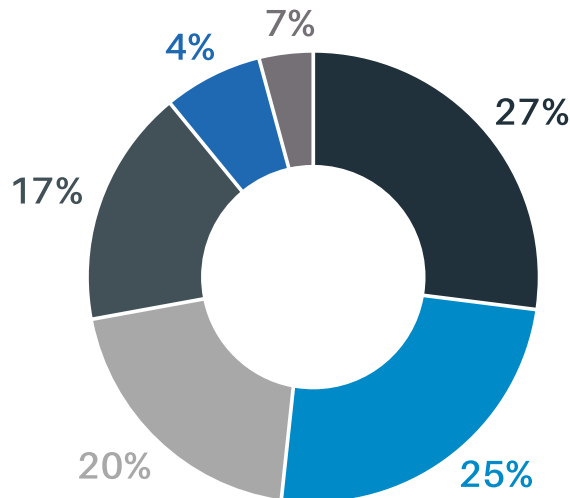


Source: Own elaboration based on data from MDIC.

The major amount of Minas Gerais imports come from Asia and the European Union. China, the United States, Argentine, Italy and Germany stand out amongst the countries of origin of such products.

Countries - import origins (2016)	US\$ FOB	Share %
China	1.252.073.677	19,10
The United States	966.802.693	14,75
Argentina	586.211.088	8,94
Italy	461.819.900	7,05
Germany	408.161.837	6,23

A significant bilateral trade relation between Minas Gerais and China, the United States and Argentina is noticed when all these countries appear with the highest share of both export markets and import origins.



- Asia (Exclusive Middle East)
- European Union - EU
- Latin American Association of Integration - ALADI
- No specific grouping
- Middle East
- Other

Source: Own elaboration based on data from MDIC.



Innovation

✦ Innovation

✦ funding

83

86

Great Brazilian Information technology Cluster

SAN PEDRO VALLEY

One of the main Brazilian start-up clusters which is located in Belo Horizonte, the capital of the state:

256

Startups

10

Coworking spaces

8

Accelerators

5

Venture capital firms

2

Incubators



MGTI 2022

The Government of Minas Gerais plans to transform the state into the best region for IT companies by 2022. The program is structured in 4 axes:

- ✧ Training;
- ✧ Generation of businesses, with incentive to the creation and acceleration of companies;
- ✧ Creation of a regulatory environment;
- ✧ Creation of an IT themed consortium in Assespro-MG (Association of Information Technology Companies)

MINAS INNOVATION SYSTEM (SIMI)

The Minas Innovation System - SIMI (Sistema Mineiro de Inovação) has the mission of creating an adequate environment to innovation in the state. It promotes interaction between researchers, companies and the government, besides aligning demand, technology supply, resources and incentives to innovations.





STARTUPS AND ENTREPRENEURSHIP ECOSYSTEM DEVELOPMENT

A program created by the Minas Gerais State Government (Brazil) to support national and international entrepreneurs to develop technological-based projects. Since 2013, SEED develops the entrepreneurial culture and the startups ecosystem in the state.

It has supported a large number of entrepreneurs, and raised millions in investments. During six months the program strengthens, promotes and fosters ideas of 40 Brazilian and international startups.

Coordinated by the State Secretariat of Economic Development, Science, Technology and Higher Education of Minas Gerais - SEDECTES, SEED has the goal to turn Minas Gerais in the largest hub of innovation and entrepreneurship of LATAM.



Technological Parks

- There are three different technology and science parks in Minas Gerais: Belo Horizonte, Itajubá, Uberaba e Viçosa.
- Two others are on the way: Juiz de Fora e Lavras.
- All of them work under close collaboration with local universities
- Technology-based companies from various industries can be established in any of these places.



Incubators and accelerators

- Minas Gerais has got 25 technology-based incubators in several regions of the state. All of them are linked to the Minas Gerais Innovation Network (Rede Mineira de Inovação).
- In this group, seven are recognised as the best incubators in Brasil.
- Technology-based companies operating in Minas Gerais receive support from accelerators.
- New investors receive support throughout the whole process of investment, from its initial phase until the full operation of their businesses.



Startup Community

- The Minas Gerais startup community has been recognised for its innovative and successful environment.
- San Pedro Valley is a start-up community which clusters more than 200 technology-based companies, as well as accelerators, incubators and coworking spaces
- Startups from any part of the world are welcome in Belo Horizonte.



R&D Centers

Companies with high technological content chose Minas Gerais for their Research and Development centers.

- ✦ Embraer, CSEM Brasil and Fiat are companies which develop new products in the state.
- ✦ There are also public research centers in Minas Gerais, such as Fiocruz (Oswaldo Cruz Foundation) and Funed (Ezequiel Dias Foundation).
- ✦ There are 10 INCTs (National Institute of Science and Technology), proving the state's great capacity in R&D.



Government Programs

The state government encourages innovation and stimulates creativity and entrepreneurship, offering programs such as Minas Digital which works on several fronts to support the digital economy, the creative economy and innovation.

- ✦ Innovative projects may also receive support from Codemig (Minas Gerais State Economic Development Company).



Financing

Minas Gerais offers financing lines created specifically to foster innovation. BDMG (Minas Gerais Development Bank) together with Fapemig (State Funding Agency), have the following lines:

- ✦ Pró-Inovação, for companies with innovative projects
- ✦ Proptec, for companies set in science parks

Codemig and BDMG also provide venture capital through holding funds: BDMGTEC and Codepar.



STATE FUNDING AGENCY

- ✧ Finances scientific and technological or innovation research projects with the goal of advancing knowledge in several areas;
- ✧ Promotes or participates in initiatives and programmes related to training human resources for science, technology and innovation;
- ✧ Existing innovation programmes:
 - ✧ **Amitec:** Stimulates improvements and technological innovation of State enterprises;
 - ✧ **Inventiva Program:** Supports the construction of innovative prototypes in the State;
 - ✧ **Pró-Inovação:** Supports the development of projects focused on product, processes, and service innovation on companies installed in Minas Gerais;
 - ✧ **Proptec:** Supports implementation, expansion and modernization proposals of companies located in Technology Parks.

FAPEMIG invested more than R\$ 853 million to several local institutions interested in developing research in the year of 2015. From this amount, more than R\$ 167 million were allocated directly in private companies.

The total amount of funds available for 3,081 research projects in 2016 was R\$ 649 million.

In 2016, special projects such as those involved in public policies and those considered priority for the government stand out with 34.86% of the investments.

These include resource availability from FAPEMIG to state priority projects focused in science, technology and innovation.

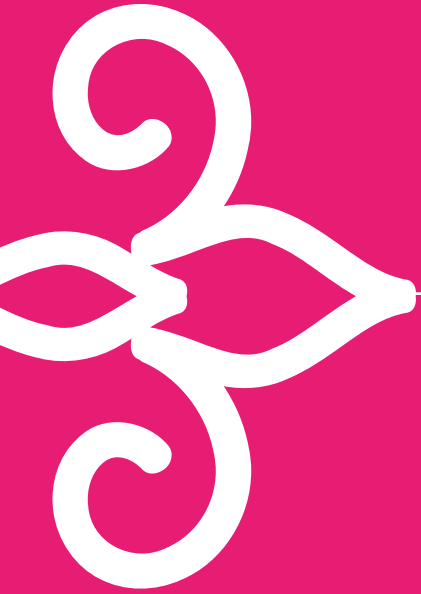
PERCENTAGE OF FAPEMIG'S FINANCIAL EXECUTION BETWEEN 2006 AND 2016

Investment	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Induced research projects	31,5	31,4	17	21,9	29,3	27,3	27,5	27,2	18,6	17,8	21,34
Universal Research Projects	27,2	25,3	24,9	25,3	17	19,5	17,6	15,6	14	10,97	11,61
Scholarship and HR training courses	20,7	17,8	20,8	19,5	17,5	17,8	17,6	18	28,1	17,54	21,93
Academic events	3,9	2,7	2,4	2	2,2	2	2,5	2,5	3,3	2,48	2,77
Special, internal and structural projects	9,7	16,2	30,4	26,3	29	28,6	30	31,8	31,1	39,66	34,86
Other Activities	1,9	1,5	1,2	1	1	1	1	0,6	1,1	8,97	0,89
Administrative Costs	5,1	5,1	3,3	4	4	3,8	3,8	4,3	3,8	3,3	6,6
Total %	100	100	100	100	100	100	100	100	100	100	100

Universal project assist researchers with scientific and technological research projects in all areas of knowledge and

Induced projects are specialized in areas considered strategic for the development of the State.

Source: FAPEMIG



Social and Education

✚ universities	73
✚ undergraduate courses offered in the state which excel in the country rank	74
✚ undergraduate student profile	75
✚ quality of life	77
✚ living costs	78

Minas Gerais excels in quality in education in Brazil. There are 14 public universities in the State, and **3 of the 10 best universities in the country are in Minas Gerais.**

Undergraduate courses offered by these universities, such as of Agronomy, Biological Sciences, Design, Information Systems, Pharmacy and Engineering occupy the first positions in the national education rankings. In addition, the state hosts one of the best business schools in Latin America – Fundação Dom Cabral (FDC) – recognized in 2017 as the 12th best in the world by the British journal Financial Times.

- ✧ 2nd place in education by the competitiveness ranking of 2015;
- ✧ Largest number of public universities in the country;
- ✧ Internationally recognised business schools: Fundação Dom Cabral (FDC), Ibmec and IBS in partnership with Fundação Getúlio Vargas (FGV).

UFMG occupies the 11th position in the ranking of Latin American universities (QS Quacquarelli Symonds University Rankings 2015).



Agronomy

UFTM is ranked 4th and UFV 5th



Food Engineering

UFVJM is ranked 1st and Uftm 2nd



Pharmacy

UFJF is ranked 1st



Automation and Control Engineering

UFMG is ranked 5th



Biological Sciences

UFSJ is ranked 2nd



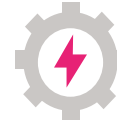
Information Technology

UFMG is ranked 1st



Design

UFMG is ranked 6th



Electrical Engineering

UFMG is ranked 1st and UFTM 5th



Environmental Engineering

UFV is ranked 3rd and UFLA 5th



Mechanical Engineering

UFV is ranked 3rd



Civil Engineering

UFTM is ranked 4th and UFV 6th



Chemical Engineering

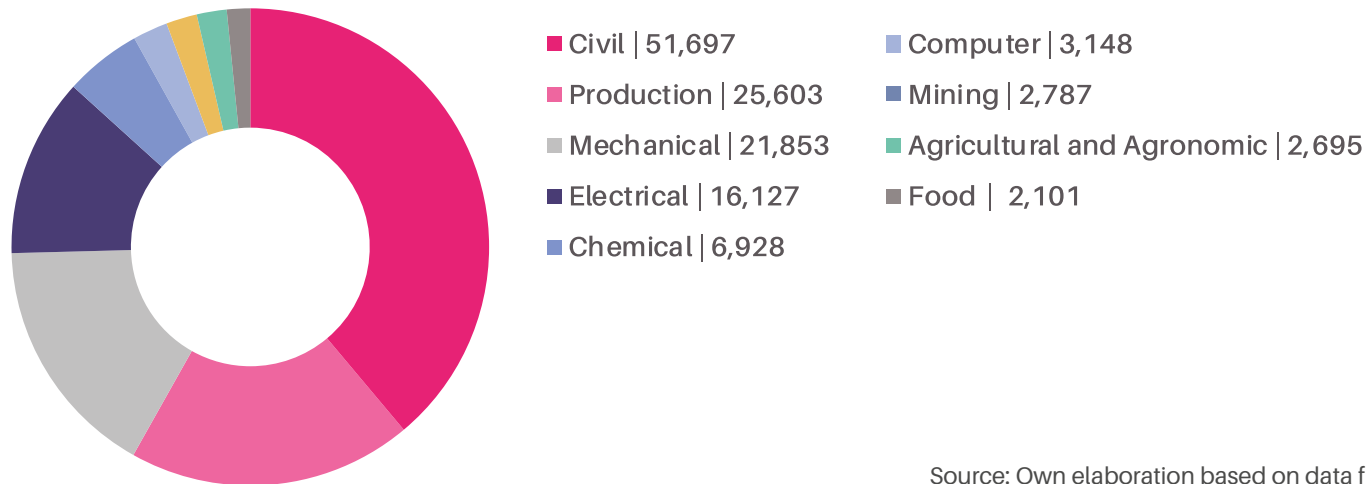
UFTM is ranked 2nd, UFMG 3rd and UFV 4th

There are over **677 thousand students** enrolled in undergrad courses in Minas Gerais.

Over **161 thousand** are distributed between engineering courses: approximately **24%** of the graduating total.

Around **17%** are in courses related to business areas such as administration and accounting.

NUMBER OF STUDENTS IN SOME ENGINEERING COURSES

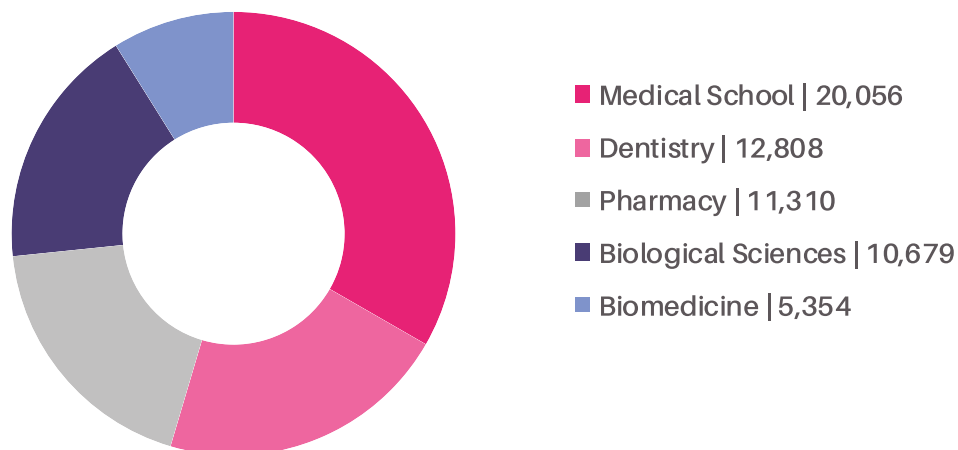


Source: Own elaboration based on data from MEC/INEP (2015)

Education and training for biotechnology and life sciences professionals are an important feature in the state. Courses guarantee qualified personnel, absorbed by the companies operating in Minas Gerais, as well as in other locations around the world.

The state has two important institutions developing projects related to business development, research and innovation in Minas Gerais and Brazil: Anbiotec and Biominas.

NUMBER OF STUDENTS IN SOME LIFE SCIENCES COURSES



Source: Own elaboration based on data from MEC/INEP (2015)

Minas Gerais has a large supply of qualified professionals with technical level education, with public centers for professional education in all regions of the state.

With campuses in many cities in the state, the **Federal Center for Technological Education (CEFET-MG)** offers technological and professional education courses, as well as undergraduate and specialisation courses.

The **Federal Institute of Education, Science and Technology of Minas Gerais (IFMG)** is also a public teaching institution which offers mainly technical and higher education courses, with an administrative branch in Belo Horizonte, besides campuses in 17 other cities. There are over 40 technical courses, 30 higher

education courses, graduate courses and also basic and continued education.

The state counts also with many units of the **National Service of Industrial Apprenticeship - SENAI**, scattered in cities and different regions. SENAI offers a variety of industrial apprenticeship and technical courses, as well as qualification and professional improvement courses.

Minas Gerais is a unique state, combining culture, history, tradition, gastronomy and nature.

Sustainability

Minas Gerais stands out in sustainability. The state capital, Belo Horizonte, was elected for the second year in a row the Brazilian capital of the Planet Hour, occupying a prominent role in solar energy reuse.

Culture

- ✧ Minas Gerais is well known for being a guardian of the Brazilian historical and cultural heritage, particularly visible in its historical cities.
- ✧ The state is home to about 60% of the country's historical heritage.
- ✧ Inhotim was chosen as one of the 20 best museums in the world by Trip Advisor.
- ✧ Recently, the Pampulha Architectural Ensemble was elected a World Heritage Site by Unesco.

LIBERTY SQUARE CULTURAL CIRCUIT

The Liberty Square Cultural Circuit is the largest integrated network of culture sites in Brazil.

The project was developed by the Government of Minas Gerais, through the State Secretariat for Culture, in partnership with private companies.

Old public buildings were transformed into interactive spaces with the aim of spreading the diversity of the historical, artistic and thematic collections, interactive cultural centers, libraries and workshop spaces, courses and open workshops. As well as a planetarium, coffee shops, restaurants and stores.



Top 10

Human capital and lifestyle among states in South America - general

Cost Effectiveness among the main states in South America

Minas Gerais still showcases:

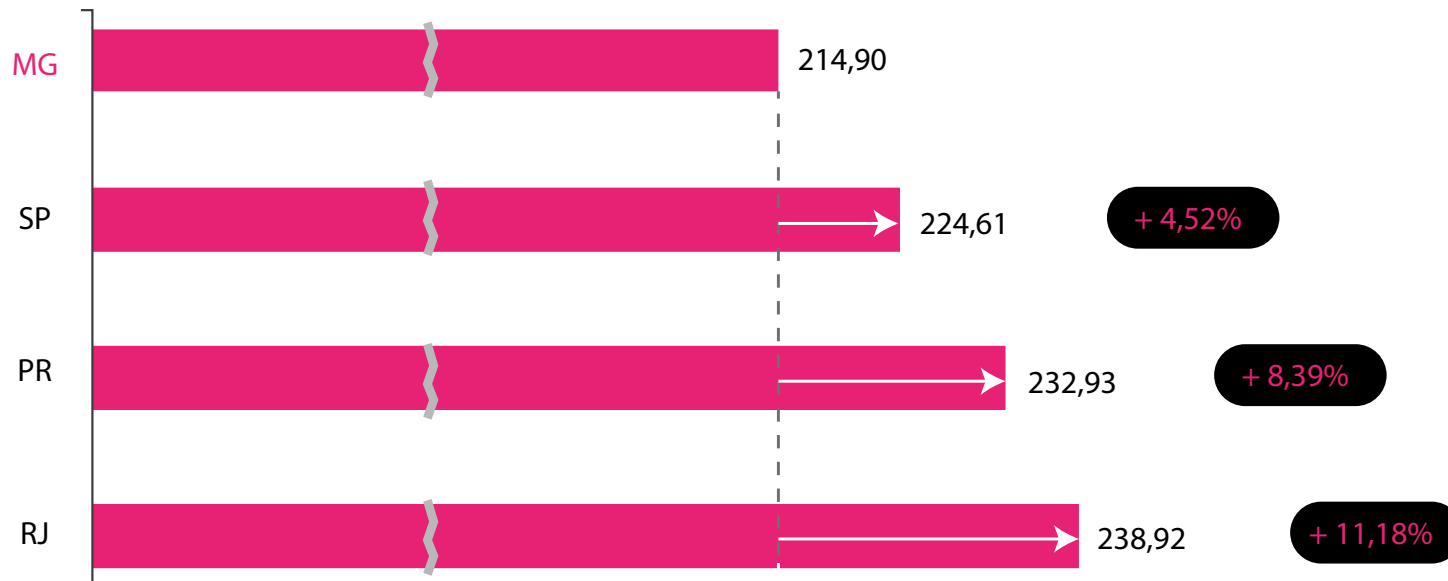
High HDI: 0,731

Mild weather

International schools

MINAS GERAIS HAS LOWER LIVING, LABOUR AND BUILDING COSTS COMPARED TO STATES LIKE SÃO PAULO, RIO DE JANEIRO AND PARANÁ.

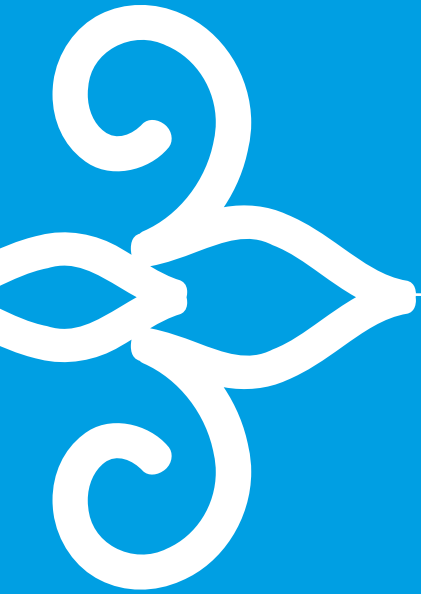
CUB/m² Index - Industrial Warehouse US\$



The Base Unit Cost (CUB in portuguese)/ m² measures construction costs by square metres. It is calculated according to rules set up by the Brazilian Technical Standards Association

(ABNT) and is a reference for the comparison of different types of construction in other Brazilian regions.

Source: Own elaboration based on data available at www.cub.org.br



Business

- ✦ public policy coordination group for sustainable economic development - GCPPDES 83
- ✦ Institutions participating in the Group GCPPDES 84
- ✦ Minas Gerais Investment and Trade Promotion Agency 88
- ✦ some projects in Minas Gerais 90

Minas Gerais has a coordination group whose purpose is to propose, articulate, integrate and promote policies and actions in industry, commerce, services, environment, tourism, innovation and water resources sectors. The group establishes criteria and evaluates investment projects eligible for priority implementation or expansion.



Minas Gerais
Development Bank
(BDMG)



Minas Gerais Energy
Company (Cemig)



Development Company
of Minas Gerais



Minas Gerais
Investment and Trade
Promotion Agency



-
- ✧ State General Attorney - AGE
 - ✧ State Secretariat of Finance (SEF)
 - ✧ State Secretariat for Agriculture, Livestock and Food Supply (SEAPA)
 - ✧ State Secretariat for Economic Development, Science, Technology and Higher Education (SEDECTES)
 - ✧ State Secretariat for Environment and Sustainable Development (SEMAD)
 - ✧ State Secretary of Tourism (SETUR)



BDMG knows that sustainable development is achieved when various aspects of life in society go hand in hand: economic diversification, with more and better jobs; Reduction of inequalities and fomenting development in all regions; Preservation of the environment; Encouraging culture and respect for diversity.

As a development bank, BDMG is a strategic agent in Minas, in the promotion of public policies that enable this development in the State. In this sense, BDMG creates programs for key sectors of the economy, with specific financing solutions.

Minas Gerais Development Bank (BDMG)

BDMG has specific funding lines for:

- 🌀 Innovation projects
- 🌀 Medium and large companies
- 🌀 Micro and small business
- 🌀 Public sector
- 🌀 Rural credit.

Financeable items for companies:

- 🌀 Implementation, expansion or modernizing
- 🌀 Working Capital
- 🌀 Purchase of machinery and equipment
- 🌀 Exportation and importation
- 🌀 R&D and innovation in products, processes and services
- 🌀 Working capital, acquisition and storage of coffee for cooperatives and coffee companies.



Minas Gerais Energy Company (CEMIG)

Cemig is one of the most solid and important groups in the electric energy segment in Brazil, as it owns or has stakes in 231 companies and 19 consortia. An open capital company controlled by the Government of the State of Minas Gerais and has 115,000 shareholders in 44 countries. Its shares are traded on the São Paulo, New York and Madrid stock exchanges.

The Cemig Group is also recognized for its size and technical competence and is believed to be **the largest integrated company** in the electric energy sector in Brazil.

In Minas Gerais, it services 96% of the concession area and has over 8,12 million consumers in 774 municipalities.

It is also the largest supplier of energy to free clients in Brazil, with a 25% market share, and is one of the largest generation groups, responsible for the operation of **120 power plants** with an **installed capacity of 8.5 gigawatts**.

Operates in 22 Brazilian states, in addition to the Distrito Federal, and in Chile, where it operates a transmission line as part of consortium with Alusa.

The company has expanded its stake in Light, assuming control of this energy distribution company which serves the city of Rio de Janeiro and other cities in the state of the same name, investments in the natural gas segment (Gasmig), telecommunications (Cemig Telecom), renewable energy (Renova) and energy efficiency (Efficientia).



Development Company of Minas Gerais (CODEMIG)

The Minas Gerais Institute for Economic Development (Codemig) is a public company, controlled by the state of Minas Gerais.

Its operations are increasingly focused }so the state's resources can generate investment opportunities, increase competitiveness and provide good business for the mining sector.

The company's operations are based on three strategic axis



MINING ENERGY AND INFRASTRUCTURE INDUSTRY

The first of these relates to **Mining, Energy and Infrastructure Industry**, in which Codemig seeks business opportunities, valuing the State's mineral potential (iron ore, niobium and rare earths), acting in the generation of thermoelectric and photovoltaic energy.



CREATIVE INDUSTRY OF MINAS GERAIS

On another axis, Codemig fosters the **Creative Industry of Minas Gerais**, through the search for opportunities in the audiovisual, fashion, gastronomy, gems and tourism segments.

In this sense, Codemig values infrastructure in hydromineral resorts and the preservation of the historical and cultural heritage under its responsibility, in addition to supporting and developing actions to stimulate business tourism and events. Special attention has also been given to the promotion of existing industrial districts in the state.



HIGH TECHNOLOGY INDUSTRY OF MINAS GERAIS

The third strategic axis is based on the **High Technology Industry**, especially strategic materials, aerospace, biotechnology, semiconductors and information technology. Codemig intends to establish strategic partnerships and new business models, and to seek new revenue generation and added value for the Company.

All these actions demonstrate Codemig's commitment to the economic development of Minas Gerais.



Minas Gerais Investment and Trade Promotion Agency (INDI)

- Our objective is to promote the execution of development policies which contribute to investment attraction, reduction of regional inequalities and job creation.
- For almost 50 years, INDI has been one of the main players in the economic development of Minas Gerais.

Minas Gerais boasts an experienced and effective investor support system.
And INDI is the main speaker.

MAINTAINERS



INVESTMENT PROMOTION



For nearly half a century, INDI has been assisting entrepreneurs who intend to invest in Minas Gerais, working on investment prospection, induction and attraction for the sustainable development of the State, as well in the retention and expansion of investments already installed. INDI offers complete monitoring in all stages of the investment process without any financial burden to potential investors. The Agency also operates internationally through missions and receptions of foreign delegations.

FOREIGN TRADE



We encourage export promotion to small and medium enterprises in Minas Gerais. Some of the activities in this field are: export missions, training, buyer projects, the Minas Gerais Foreign Trade Outlook, the Monthly Trade Balance, exporter services and technical notes.

INTELLIGENCE



INDI provides socio-economic and demographic information on cities and regions of the state. INDI uses the DataViva Platform, an open platform for socioeconomic data research, through which INDI develops data analyses in order to support economic development policies.



Over **3000** companies have received INDI's assistance in the agency's 50 years of operation. These companies have seen their businesses grow together with the economy of the state.

- ↳ **Food:** Danone, Ferrero, Kopenhagen, Unilever.
- ↳ **Aeroespace:** Embraer, Gol, Helibras.
- ↳ **Automotive:** Fiat, Iveco, Mercedes-Benz.
- ↳ **Beverage:** Ambev, Coca-cola.
- ↳ **Biotechnology:** Biomm, Novo Nordisk, St. Jude Medical.
- ↳ **Electronics:** GE, Panasonic, Philips, Toshiba.
- ↳ **Mining:** Anglo Gold Ashanti, Anglo American, Vale.
- ↳ **Steel Industry:** ArcelorMittal, Gerdau, Usiminas.
- ↳ **Equipments and Transport:** GE Transportation, Progress Rail (Catterpillar), XCMG.



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