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# Zacatecas

*A reference for the global mining industry*



*Motherland - your surface is corn  
your mines are the palace of the  
King of Gold and your sky... storks  
in flight and the green lightning of  
streaking parrots.*

*Ramón López Velarde*



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## **Governor of Zacatecas**

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**Miguel  
Alonso Reyes**

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My government's development plan involves the creation of more and better job sources as one of its principal priorities.

We brought the Zacatecas unemployment rate down by more than two percentage points from 7% in the third quarter of 2011 to 4.5% in the same period in 2014. That rate is below the national average, which was 5.2% for that period<sup>1</sup>.

The government of the state will continue to actively work with the main economic sectors to ensure that each of them is provided with the conditions required to achieve their potential and that the economically active population is absorbed into the labor market.

The results achieved by my government show annual GDP growth (at constant prices) of 3.9% from 2010 to 2013, placing the state above the national average, which was 3.6% for that period<sup>2</sup>.

We are building a modern and competitive economy which will place us strategically within the global economy and contribute to social well-being as well as to the generation and utilization of scientific and technological know-how.

One result of that vision is this state's position as the first in Mexico to have a mining cluster.

One of the cluster's objectives is to attract state-of-the-art technology for the operation of local, domestic and foreign companies, bringing academia, enterprises, and suppliers together in a great alliance favoring competitiveness, know-how and mutual strengthening.

The greater complexity in the composition of ore mined posed the challenge of attracting investment that, guided by innovation and technological development, will provide an effective boost to mining in Zacatecas.

It is particularly important to come up with comprehensive mining development plans that will guarantee an economic benefit for the state.

Contributing to the consolidation of the mining industry as an economic driver for Mexico is a responsibility requiring us to make use of new operating tools, create alliances, and develop successful practices within that sector.

Today's favorable scenario in Zacatecas can be better explained in the context of the results of the President of Mexico's policies and efforts, as his structural reforms are beginning to show a nation in movement.

The set of amendments that is driving Mexico, including political, educational, fiscal, telecommunications, and energy reforms, comprise a series of instruments set in place by Enrique Peña Nieto's administration to attract investment and boost the quality of life in Mexico.

Mexico is gradually implementing additional reforms involving the Social Security and health system, which provide greater thrust to the development of science and technology at public and private institutions.

Zacatecas is benefiting from those great reforms and adding them to a long-term social and economic development project whose principal purpose is to achieve well-being for Zacatecan families.

With better results from economic development... ***Zacatecas forges ahead!***

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1 National Institute of Statistics and Geographicaly (INEGI for its acronym in Spanish), Economic Information Bank, National Accounts System.

2 INEGI Economic Information Bank, National Accounts System, 2013.



**Clúster Minero  
de Zacatecas A.C.  
President**

**Jaime  
Lomelín Guillén**

The economy of Zacatecas is rooted in different activities, such as mining, agriculture, cattle-raising, tourism, and culture. Of these sectors, mining is the most important, i.e., one of the state's economic pillars. In 2013 alone, it contributed 28%<sup>3</sup> to GDP at current prices.

We realize that underground mining requires highly specialized machinery and equipment, as well as good communications (among other factors) in order to provide security and make it possible to effectively exploit all available mineral deposits. Zacatecas, Chihuahua, Durango, Aguascalientes, and San Luis Potosí form a mining corridor specializing in underground mining with experience, know-how, communications, and transport connecting them to the rest of the country.

The mining sector is dynamic and is linked to a number of industrial enterprises. It is a focal point for investment in machinery and equipment in the respective supply chain. Furthermore, it contributes to growth in human resources, which strengthens the position of the state in general, as it has done throughout its long history. Those are the factors behind the goal set forth by the government of the state of Zacatecas to conduct a study designed to highlight our achievements, capacity, and potential. We are joining the effort to generate synergy that will promote, through alliances and agreements, the competitiveness of the mining industry in the state of Zacatecas.

We would like the community of investors to see that mining development in the state of Zacatecas enjoys a privileged geographical location at the center of a network that spans the north, south, east, and west of Mexico. That geographical position is strengthened by highway and railway networks linking it to the country's principal ports, borders, and economic centers. Getting there is easy, because the state boasts roads, railways, and an airport serving domestic and international traffic.

All these railways, highways, and airports (with strategic connections for doing business) place investors in a very favorable position for transporting ore, raw materials, machinery, manufactured items, and services to the rest of the country and abroad. Those of us that have done business for more than 50 years know that it is a great place to carry out entrepreneurial activities.

Our purpose is clear: we must strengthen the presence of our mining cluster (Clusmin) which is a platform that provides a favorable business environment to strengthen the mining industry in the state. This Clusmin is an organization led by the private sector with support from educational institutions and the government.

It is the mission of the Clusmin to improve the mining industry by means of joint endeavors designed to develop supply, devise innovative processes, increase industrial security, and develop human capital within the sector.

We support the efforts of the government of Zacatecas to maintain and constantly rebuild its network of highways and railways as a means of promoting the development of infrastructure that will continue to expand the network connecting the state to the other states and federal entities in Mexico; as well, to countries in North and South America, and other continents.

Improvements in infrastructure, communication, competitive salaries, logistical nodes, offer in education and the network of hospitals (among others) will be discussed in this publication as they illustrate the efforts made by the state to boost the level of well-being for its inhabitants.

Those measures, as well as the specific steps designed to strengthen industrial policies, increase the appeal of the state for major international investment. The Zacatecas mining sector enjoys a favorable investment scenario over the medium and long term, generated by academic, government, and industrial entities.

There exists important success cases of supplier companies established in Zacatecas; thereby, opening very good opportunities to participate in the domestic market that requires competitiveness and good service. Likewise, there exists three operating industrial parks; five other parks in development; and one Science and Technology park, also in development.

The state's colonial past has made its culture known worldwide and can still be felt in important facets of the mining and tourism industries. They are key factors in the development of the state based on mining providing ample space for growth.



**PwC Mexico**  
**Senior Partner**

**Carlos Méndez  
Rodríguez**

This publication provides a panoramic view of Mexico's very prominent worldwide position in the production of metal and non-metal ores, in reserves of the principal metals, and in their notable capacity to attract mining investment. It also includes an analysis of the level of development (focusing on underground mining) of a number of indicators and critical variables for evaluating the mining industry in the different states and regions of Mexico, as well as the key macroeconomic variables for the state of Zacatecas and their performance in the West-Central region<sup>4</sup>.

Mexico's remarkable position within the mining industry stands out amid the recent worldwide scenario of falling prices for different metals and the rise in the tax burden as of 2014. Nevertheless, Mexico has managed to generate a sustained increase in production over the last few years, significantly based on the West-Central region of the country, whose strength lies predominantly in Zacatecas.

Presenting the potential of the mining industry in the light of the macroeconomic behavior of the state of Zacatecas provides investors with additional investment factors. The principal findings of this study demonstrate the economic competitiveness of the state, as attested to the increase in its GDP; the growing investment in skilled labor; the state investment in infrastructure; schooling, culture, public hospitals, and the state's commitment to doing business.

***“Zacatecas, a reference for the global mining industry”*** is based on a previous report published by PwC, “Mexico and its States of Opportunity”. Both publications emphasize the positive outlook in the country's development achieved via different indicators. The methodology used in this report was adapted to create indicators designed to highlight the contributions of the mining industry in Zacatecas. Another important change was to replace the regionalization developed by Angel Bassol (geographer and researcher) with those constructed by ProMéxico in order to identify the country's urbanization patterns<sup>5</sup>. The latter was used because it shows the economic behavior of the different regions from the viewpoint of public-private investments made over the last decade.

Some of the notable results of the study confirm that the West-Central region stands out because of the number of mining companies operating in it.

It also generates significant value in the production of different metals, with notable strength in underground mining. That – along with high levels of investment over the last few years in machinery, plant and equipment, and intangible assets by foreign subsidiaries in Mexico – show that Zacatecas was the second most important contributor to the Mexican mining GDP in 2013. That finding is complemented by a wider view that shows that the surrounding regions have also achieved a great deal of development (particularly the northeast region) especially with regard to the number of underground mining companies in operation and the respective production value; as well as the investment in machinery, plant and equipment, and intangible assets in Mexico by subsidiaries of foreign companies.

The results that Zacatecas has achieved prove that it is a state with great business potential, as confirmed by the data contained in the World Bank's 2014 “Doing Business in Mexico.” The study places the state seventh in ease of doing business in Mexico and first in resolution of trade disputes for breach of contract.

It is important to point out that today in Mexico, the growing volume of statistical information available both at the state and national level has made it possible to specialize our indicators. For example, we conducted a careful selection of three indicators for the mining sector environment (five variables); the value of mining production (four variables); and employment generation and participation (two variables).

With regard to the macroeconomic environment in Zacatecas and the West-Central region, we selected the variables that we consider support to investors' interests and offer a more complete panorama of conditions in Zacatecas.

We decided that the study should include data analysis, which we combined with careful preparation based on the review of facts and data. The available information taken as a whole confirms that Zacatecas provides a scenario for the development of well-being in Mexico, with added emphasis on underground mining – although there is potential for open-pit mining as well.

<sup>4</sup> These have been obtained and/or developed from available official sources or public information of companies quoted on stock markets.

<sup>5</sup> The ProMéxico classification can be useful to investors as it is based on the 2007-2012 National Infrastructure Development Plan.

*“Zacatecas, a reference for the global mining industry”* shows that Zacatecas is capable of consolidating its position as a center of activity and a destination for investment for international suppliers’ manufacturing facilities. That is to say that the conditions are in place for the consolidation of a cluster that will increase the presence of companies – manufacturing underground mining machinery and equipment – and open the door to other participants in the mining supply chain focused on covering the Mexican market, as well as in countries in North and South America, and other continents.

The study is focused on underground mining, particularly on non-ferrous precious and industrial metals, which is the type of mining that has typically characterized the state of Zacatecas. However, it also acknowledges that due to Mexico’s great mining potential, if the study was to emphasize open-pit, coal, iron, or other forms of mining, the results would be different, thus favoring the strengths of other states or regions.

Nevertheless, the potential of open-pit mining in Zacatecas is recognized, as it is home to one of the most important mines of that type in Mexico and North America, Peñasquito. In 2014, Peñasquito, which belongs to Goldcorp, produced 567,800 oz of gold, 25.81 million oz of silver, 149.5 thousand tons of zinc and 69 thousand tons of lead<sup>6</sup>, which certainly strengthens our understanding of the mining potential of Zacatecas.

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6 The Mexican Mining Chamber, Annual Report, 20



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# About the study

## Definition of economic regions in Mexico

The economic regions of Mexico included in this study are based on the classifications devised by ProMéxico, an entity that promotes and coordinates the attraction of investment into this country and provides support to promising projects and the exportation of the products of different Mexican companies. They are utilized in this study to illustrate, at a Zacatecas economic level in Chapter 1, the degree of development of geographic regions with a perspective of generating synergies that allow the federal entities to make better use of infrastructure and geographical position. They are also utilized in the mining chapter of our narrative to provide a better understanding for the reader.

In some instances, the document presents a number of graphs in Chapter 1 showing the states in different colors. Within each region, the intensity of the color increases in areas where there is greater development in the variable, that is to say, the more intense the color, the higher the contribution by the state to the indicator.

ProMéxico bases its regional classification on the recent behavior of investment patterns in Mexico, and has divided the country into five economic regions:

- **The Central region** Querétaro, Hidalgo, Puebla, Tlaxcala, Morelos, Mexico City, and the State of Mexico.
- **The West-Central region** Aguascalientes, Colima, Guanajuato, Michoacán, Jalisco, Nayarit, San Luis Potosí, and Zacatecas.
- **The Northeast region** Chihuahua, Durango, Coahuila, Nuevo León, and Tamaulipas.
- **The Northwest region** Baja California, Baja California Sur, Sonora, and Sinaloa.
- **The Southern region** Veracruz, Tabasco, Campeche, Yucatán, Quintana Roo, Guerrero, Oaxaca, and Chiapas.

Graph 1 - Economic regions classified by ProMéxico

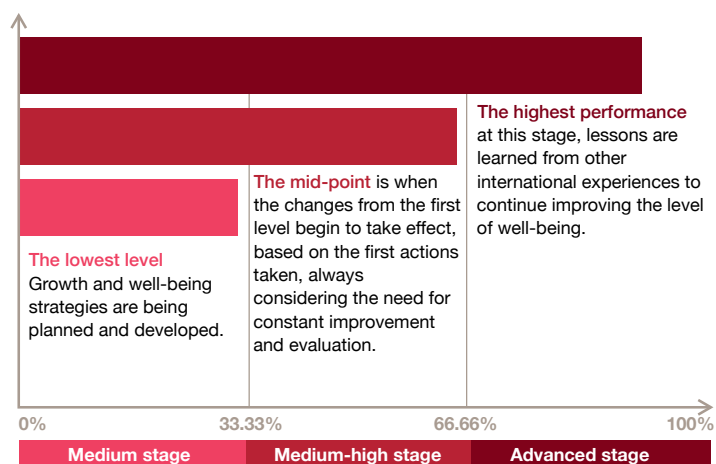




## Stages and percentage of completion as a measuring tool

A three-stage measuring system is used to show development in each region. What distinguishes our division is that it does not generate a numerical classification; rather, a classification based on stages that emphasize constant efforts towards improvement in all states of the Republic. The measurement system establishes nationwide ranges and allows each state to be positioned, in accordance with its performance at one of three stages: medium, medium-high, and advanced.

Graph 2 - Measuring development



Source: PwC – prepared in-house.



## Building the indicators

Indicators generated for the study *“Zacatecas, a reference for the global mining industry”* have been adapted from the methodology used in PwC’s publication “Mexico and its States of Opportunity”. This methodology is our reference for identifying development in the area of public policy<sup>7</sup>. However, this work was intended to gather and compile information concerning the mining sector and macroeconomic, social, and juridical conditions that acknowledge the specific potential of the state of Zacatecas, the West-Central region and Mexico.

Following is a description of mining indicators:

Graph 3 - Mining indicators

Mining indicators	Description
<b>The mining sector environment</b>	Significant information is provided on the number of mining companies as of December 31, 2013, including a variable for the number of underground mining companies from the same date, the percentage of the mining industry to the 2013 GDP, the number of exploration projects as of December 2013, and the investment of public foreign companies in property, plants and equipment, development expenses, and capitalizable exploration expenses incurred in 2013.
<b>The value of mining production</b>	Shows the value of mining production of the different minerals in Mexico <sup>8</sup> and the income of public underground mining companies for non-ferrous precious and industrial metals for 2013.
<b>Employment generation and participation</b>	The number of mining-sector employees and the participation of mining workers as compared to overall economically occupied workers at the end of 2013.

Our analysis of the Mexican mining sector is based on three indicators, i.e., *the mining sector environment, mining production, and employment generation, and participation*. The intention is to identify mining sector strengths and opportunities as a driver of state, regional and nationwide development.

Mining variables are considered per state in order to determine the level of development by indicator and by variable, as well as what they represent for the development of the mining industry in Mexico.

<sup>7</sup> PwC, Mexico and its States of Opportunity, 2012

<sup>8</sup> Taken from the Annual Statistics Report - Mining in Mexico

## Objective of the study

The objective is to position the state of Zacatecas, both at the domestic and international levels, as a destination for investment. This is based on the features of the entity's strategic sectors, specifically the mining sector, with added emphasis on underground mining. The study shows the potential of Zacatecas as an ideal destination for the production of machinery and equipment, including heavy equipment, principally for underground mining. There is also potential for open-pit mining and for increasing and strengthening the supply chain surrounding the industry. Subsequently, the area could serve as a production and distribution center for Mexico and North America, as well as for South America and other parts of the world.

For that purpose, PwC has applied its methodology for analyzing indicators (and variables) that are considered measurable, verifiable and objective. The results of this analysis have been used to develop, write and produce a study whose narrative is holistically focused and is intended to:

- a) Present the state of Zacatecas in domestic and international circles, pointing out its social, economic, tourism, cultural, industrial, and quality-of-life features; as well, its overall advantages, opportunities and strengths, demonstrating investment opportunities, particularly in the mining sector.
- b) Describe the strengths of the mining industry based on the indicators described on the preceding page.



# ***Introduction***

## **Mexico, a magnet for investment**



## *Mexico is the second largest economy in Latin America and the fourth in terms of GDP*

Today, Mexico has an attractive business environment, legal certainty, and the world's second largest network of free trade agreements, widely developed economic sectors, and an extremely competitive cost profile. It is also developing in terms of infrastructure to make it a world-class logistics platform.

With a per capita GDP of US\$10,361 in 2014, Mexico is one of the most competitive countries in the region for productive investment at the international level. It is the thirteenth largest economy in the world in nominal terms and eleventh in Purchasing Power Parity (PPP)<sup>9</sup>. Thanks to the macroeconomic and political stability Mexico has experienced over the last few decades, with stable inflation, it is the second most important economy in Latin America and the fourth in the continent in terms of GDP<sup>10</sup>.

Mexico enjoys a strategic geographic position, has signed eleven free-trade agreements with access to 46 countries; and has a young and highly skilled workforce with 110,000 engineers who graduate annually. During the administration of current president Enrique Peña Nieto, the three main political parties in Mexico signed the "Pact for Mexico" in December 2012. The purpose of the pact was to implement major actions and specific reforms that will project Mexico towards a more prosperous future. They are also intended to set the basis for a new political agreement to make major changes that will contribute to democratic transition and drive economic growth that will generate quality jobs for Mexicans and make it possible to reduce poverty and social inequality.

As a result of that historic agreement, eleven reforms have been approved covering matters of national importance, such as labor relations, education, the financial system, telecommunications and radio broadcasting, economic competition, the energy industry, the political and electoral regime, transparency, the penal system, the Injunction Law and public finances. The reforms resulting from the "Pact for Mexico" are intended to strengthen competitiveness and investment in Mexico. A high level of international investment can already be seen in several sectors<sup>11</sup>.

<sup>9</sup> World Bank, 2015.

<sup>10</sup> ProMéxico.

<sup>11</sup> World Bank 2015, ProMéxico, INEGI.



## *The benefits of investing in Mexico*

### *Mexico has a young and skilled population*

- It is an emerging economy with a growing consumer market and a population of 123.8 million<sup>12</sup>.
- The population is young; i.e., 50% is under 27 and the average age is 28. The consumer-oriented middle-class is expanding<sup>13</sup>.

### *Mexico offers access to the largest markets in the world*

- It is the thirteenth largest economy in the world in nominal terms and the eleventh in terms of Purchasing Power Parity (PPP)<sup>14</sup>.
- It accounts for approximately 34% of overall Latin American trade.
- It has the second highest number of free-trade agreements in the world with access to 46 countries, including the Pacific Alliance treaty and NAFTA (North American Free Trade Agreement), which provide preferential access to key countries in North America, Latin America, and the Asia Pacific region. Mexico also has preferential trade agreements with Brazil and Argentina, for example.
- It is an ideal country to export, manufacture, and do business with the rapidly growing Latin American market and USA.
- It is a member of the Pacific Alliance, which allows Mexico to act as a platform for the Asia-Pacific countries. Under that alliance, Mexico has strengthened its relationship with Latin American mining countries such as Chile and Peru<sup>15</sup>.
- It is located next to the US and Canadian markets and has a close relationship with them, as it is a member of NAFTA. The length of the Mexico-USA border is 3,142 kilometers (km)<sup>16</sup>.

### *Mexico offers a favorable business environment*

- Mexico is among the thirteen most attractive countries for investment, according to the 2015 United Nations Conference on Trade and Development World Investment Report<sup>17</sup>.
- Mexico is in ninth place among the world's 25 most attractive countries for investors, according to A.T. Kearney's Foreign Direct Investment (FDI) Confidence Index 2015<sup>18</sup>.
- Mexico is among the top 25 in the Atlas of Economic Complexity, published by the University of Harvard and the Massachusetts Institute of Technology (MIT)<sup>19</sup>.
- In 2014, Mexico registered US\$22,568.4 million in FDI. The FDI flowed into manufacturing (US\$12,869.9 million), financial services (US\$5,556.6 million), mining (US\$2,215.2 million), trade (US\$1,954.3 million), and construction (US\$872.6 million), among others<sup>20</sup>.
- Its economy is stable, and its inflation rates and energy prices are low. The government is making a concerted effort to keep inflation below the average global level. In 2014, its inflation rate was 4%<sup>21</sup>.
- It has low financial volatility, a skilled labor force and structural reforms boosting the country's development.

<sup>12</sup> World Bank, 2015.

<sup>13</sup> Idem.

<sup>14</sup> Idem.

<sup>15</sup> ProMéxico.

<sup>16</sup> Idem.

<sup>17</sup> United Nations Conference on Trade and Development World Investment Report, 2015.

<sup>18</sup> A.T. Kearney's Foreign Direct Investment (FDI) Confidence Index, 2015.

<sup>19</sup> Atlas of Economic Complexity, published by the University of Harvard and the Massachusetts Institute of Technology (MIT), 2014.

<sup>20</sup> National Committee of FDI, Secretariat of Economy, 2014

<sup>21</sup> World Bank, 2015.

*In Latin America, Mexico is the second biggest economy in terms of GDP.*

## Competitive industries

- Mexico is the largest exporter of manufactured goods in Latin America<sup>22</sup>.
- In 2014, 86.6% of exports were manufactured goods<sup>23</sup>.
- Mexico has also proven its capabilities for manufacturing high-technology products, such as in the automotive and aerospace sectors.
- Its customs rates are substantially lower than those of other Latin American countries.
- It is the fourth exporter of light vehicles in the world, fifth in exportation and production of auto parts; and seventh in production of light vehicles. In 2014, the production of vehicles grew 9.8%, for a total of 3,219,786 vehicles. Exports increased 9.1%, for a total of 2,642,887 vehicles<sup>24</sup>.
- It is number one in flat screen TV exports in the world, even above highly competitive countries in Asia. These exports totalled US\$9.7 billion from January to September 2014, which represents an increase of 5.5% over the same period in the previous year<sup>25</sup>.
- It holds first place as an exporter of domestic appliances in Latin America and sixth in the world. In 2013, Mexico exported US\$6,712 million worth of domestic appliances resulting in a balance of trade surplus. 84.2% of total exports from Mexico flowed to the US followed by Canada and Colombia<sup>26</sup>.
- Mexico is the sixth largest provider to the US aerospace industry. Mexico has the fourth largest fleet of private jets in the world. The Mexican aerospace sector currently employs more than 35,000 workers in 18 states. There are more than 285 companies and support entities in the Mexican aerospace sector. According to the Ministry of the Economy, annual average growth of the Mexican aerospace industry is 14% and the 2010-2020 Strategic Program estimates that by 2020, it will rank tenth in the world and export around US\$12.3 billion worth of related products. The largest General Electric research and design center, the world's largest manufacturer of airplane engines, is located in Querétaro, Mexico. The aerospace sector is mainly concentrated in Baja California, Nuevo León, Querétaro and Sonora<sup>27</sup>.

***In Latin America, Mexico is the principal automotive manufacturer, with 3.2 million cars produced in 2014.***

Mexico is the second largest provider of light vehicles to the United States.

Mexico's auto and auto parts industry contributed 19.8% of manufacturing GDP in 2014 and 3.5% of total global production in 2013.

Nineteen of the largest original equipment manufacturers (OEMs) are based in Mexico along with more than 200 tier 1 suppliers. In the coming years, six more companies are expected to build facilities. Mexico is a leading designer and manufacturer of power trains, belts, seats, suspensions and chassis, elastic elements, metal parts, harnesses and lighting, among others. More than 80% of what the Mexican auto industry manufactures is exported. Mexico's auto and autoparts industry received US\$13.3 billion in direct foreign investment from 2006 to 2012, or 8.8% of total FDI in Mexico for that period.

Mexico's auto and auto parts industry employs more than 645,000 workers and concentrates ninety out of one hundred of the world's largest autopart companies.

Sources: ProMéxico 2014, Mexico's Auto Industry Summit 2014, Mexican Automotive Industry Association (AMIA, for its acronym in Spanish) 2014.

22 ProMéxico, 2014.

23 INEGI, Commercial balance of Mexico, January 2015.

24 Speech by Minister of Economy, Idelfonso Guajardo, Secretariat of Economy, 2015.

25 ProMéxico, 2014.

26 Idem.

27 The Mexican Federation of Aerospace Industries (FEMIA for its acronym in Spanish) 2013, Mexico's Aerospace Summit, 2015.

## Ease of operation

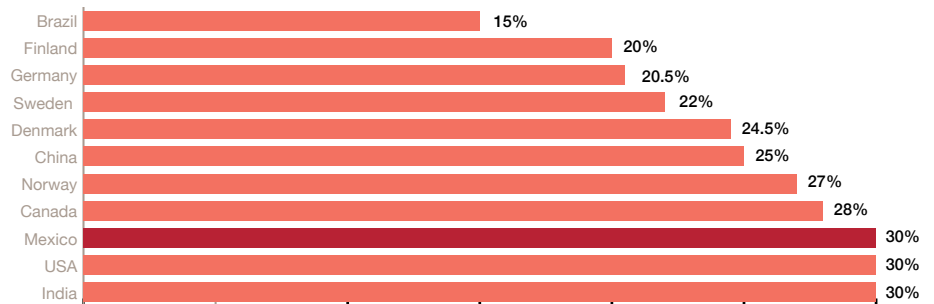
In terms of ease of operation, Mexico is well-positioned, as the procedures and time required to open or close a business, or to obtain a construction permit, are critical to success in international business. In Mexico, investors require only six procedures and fewer than seven days to open a business; and eleven procedures and fewer than 88 days to obtain a construction permit.

With regard to procedures required for exporting and importing, Mexico fares well; as there are not many required procedures, with basically four documents required to complete an export procedure and approximately the same number to complete an import procedure<sup>28</sup>. Mexico has an advantage over many countries when considering the number of documents required to export due mainly to the use of technology.

## Corporate taxes

There are numerous factors impacting operating costs and cash flows, and therefore profitability, including the corporate tax rate and other government fees and duties. The following graph compares corporate income tax in some selected countries.

Graph 4 - Corporate Income Tax



Source: PwC, Worldwide Tax Summaries – Corporate Taxes 2014/15.

<sup>28</sup> World Bank Doing Business, 2014.



## Certainty for foreign investment

The signing of Agreements on Reciprocal Promotion and Protection of Investments (ARPPi) is part of the Mexican government's strategy to provide local and foreign investors with a legal framework that will strengthen the protection of foreign investments in Mexico and of Mexican investment abroad.

Generally speaking, ARPPis cover the following disciplines: definition of investment, the application, promotion and admission environment, the treatment of investments, expropriation, transfers, and resolution of investor-state and state-state controversies<sup>29</sup>.

Furthermore, some free trade agreements signed by Mexico include an investment chapter similar to an APPRI. Such is the case of current agreements with the US, Canada, Colombia, and Japan, among others.

### ARPPis signed by Mexico

Country	Year	Country	Year	Country	Year
Switzerland	1996	South Korea	2002	UK	2007
Argentina	1998	Cuba	2002	Trinidad and Tobago	2007
Netherlands	1999	Greece	2002	Spain	2007
Denmark	2000	Italy	2002	India	2008
Finland	2000	Uruguay	2002	Belarus	2009
France	2000	Belgium-Luxembourg	2003	China	2009
Portugal	2000	Czech Republic	2004	Slovakia	2009
Germany	2001	Iceland	2006	Singapore	2011
Austria	2001	Panama	2006		
Sweden	2001	Australia	2007		

Source: ProMéxico.

<sup>29</sup> ProMéxico.

## Why invest in Mexico?

In the developing world, the private sector is the largest employer, providing an estimated 90% of jobs. Having the right business regulations and related institutions is therefore essential for the health of an economy.

According to the World Bank's Doing Business 2016, Mexico is in 38th place of 189 countries classified for ease of doing business and in first place among the other emerging economies in Latin America and the Caribbean.

The ranking includes the following indicators: starting a business; dealing with construction permits; getting electricity; registering property; getting credit; protecting minority investors; paying taxes; trading across borders; enforcing contracts; and resolving insolvency.

### Ranking for “ease of doing business” (among 189 countries)

#### Mexico versus G7

2015	2014	2013	2012	Country
7	7	4	4	USA
6	8	7	7	UK
14	16	17	13	Canada
15	14	20	19	Germany
34	29	24	20	Japan
27	31	34	29	France
<b>38</b>	<b>39</b>	<b>48</b>	<b>53</b>	<b>Mexico</b>
45	56	73	87	Italy

Source: World Bank Doing Business 2016.

#### Mexico versus E7

2015	2014	2013	2012	Country
<b>38</b>	<b>39</b>	<b>48</b>	<b>53</b>	<b>Mexico</b>
55	55	71	71	Turkey
84	90	91	91	China
57	62	112	120	Russia
116	120	130	126	Brazil
109	114	128	129	Indonesia
130	142	132	132	India

Source: World Bank Doing Business 2016.

## The world in 2050

In 2050, Mexico will be among the ten largest economies in the world, and is estimated to be the sixth largest economy in GDP in terms of PPP.

**In 2050, Mexico is expected to be the sixth largest economy in the world.**

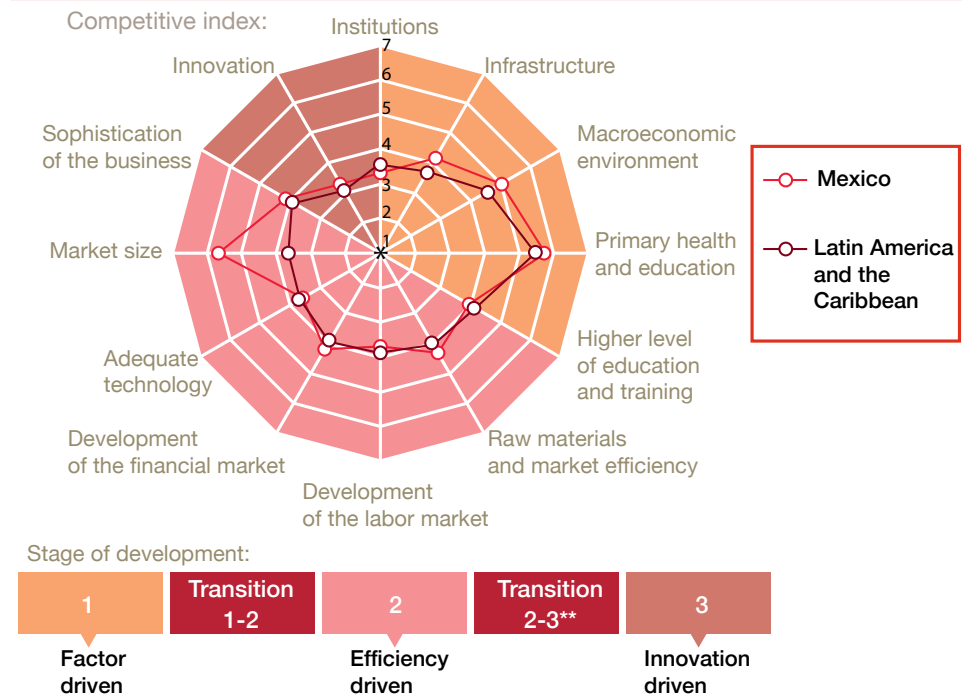
2014		2030		2050		
PPP range	Country	GDP in terms of PPP (US\$bn)	Country	GDP Projected in terms of PPP (US\$bn)	Country	GDP projected in terms of PPP
1	China	17,632	China	36,112	China	61,079
2	USA	17,416	USA	25,451	India	42,205
3	India	7,277	India	17,138	USA	41,384
4	Japan	4,788	Japan	6,006	Indonesia	12,210
5	Germany	3,621	Indonesia	5,486	Brazil	9,164
6	Russia	3,559	Brazil	4,996	<b>Mexico</b>	8,014
7	Brazil	3,073	Russia	4,854	Japan	7,914
8	France	2,587	Germany	4,590	Russia	7,575
9	Indonesia	2,554	<b>Mexico</b>	3,985	Nigeria	7,345
10	UK	2,435	UK	3,586	Germany	6,338
11	<b>Mexico</b>	2,143	France	3,418	UK	5,744

Source: Estimates made by the International Monetary Fund 2014; projections estimated by PwC for 2030 and 2050.

## The best-positioned country in Latin America

Mexico is better positioned than all other countries in Latin America, according to the World Economic Forum's Global Competitiveness Report of 2014-2015.

Graph 5 - Competitive index (12 pillars) and country stage of development

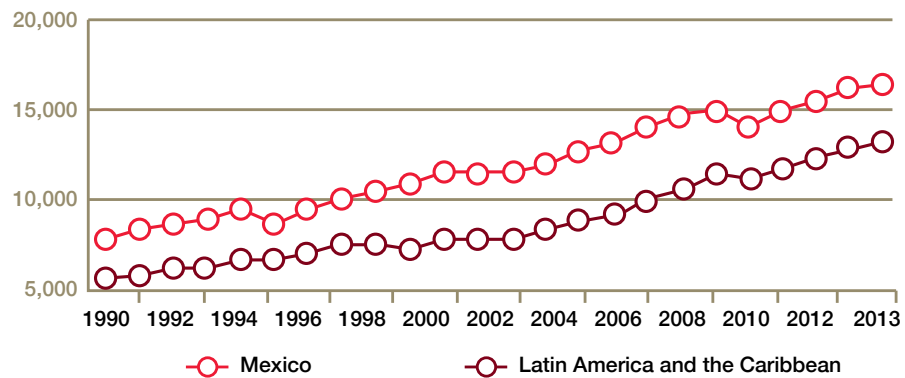


\*Score from 1 to 7, where the higher the score, the better their position in terms of competitive index.

\*\*Mexico was ranked in transition from stage 2 to stage 3, where the latter stage is the top in terms of stage of development.

Source: World Economic Forum, 2014-2015.

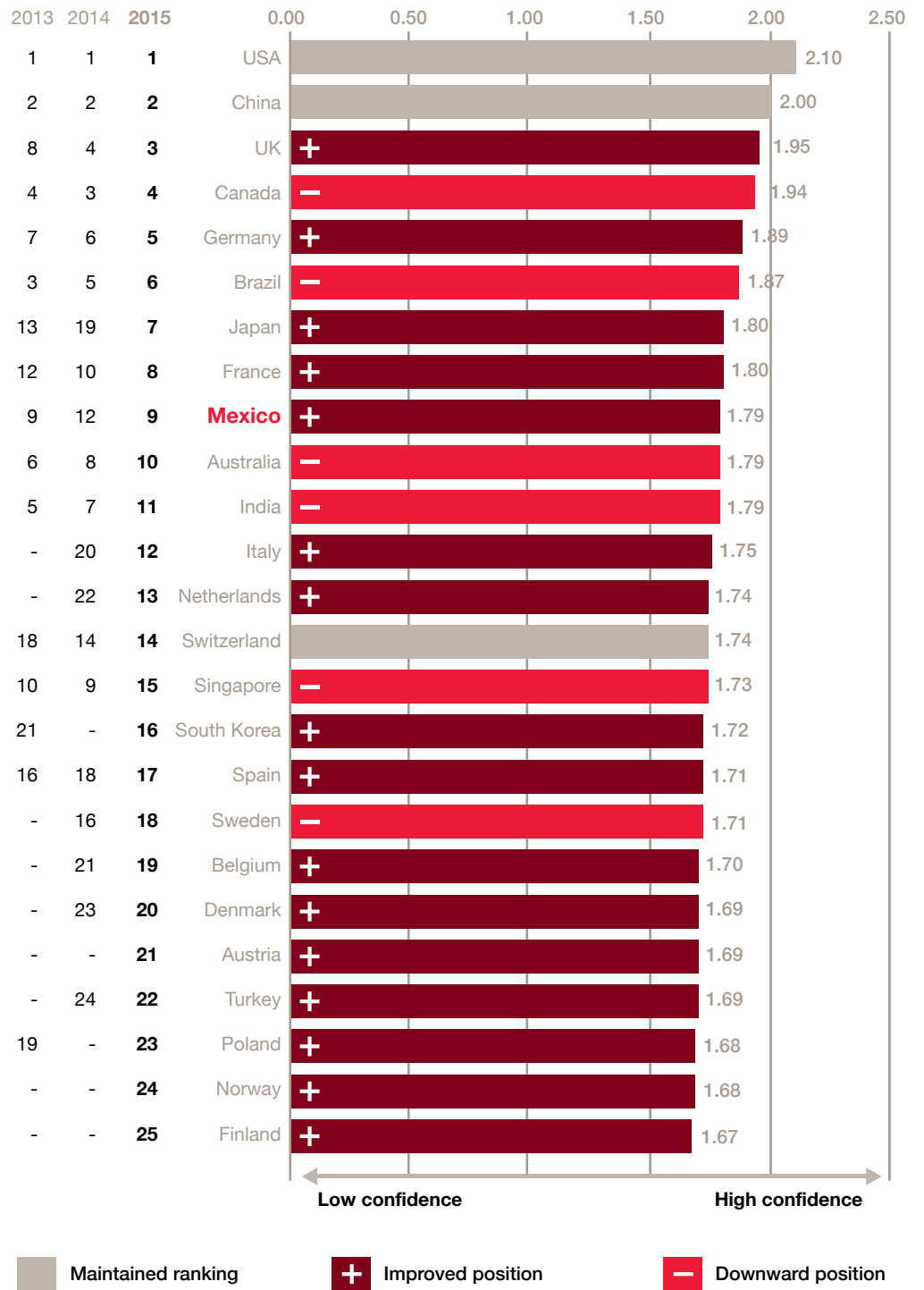
Graph 6 - GDP per capita in PPP, US Dollars 1990-2013



Source: World Economic Forum, The Global Competitiveness Report, 2014-2015.

Mexico went from twelfth place in 2014 to ninth place in 2015 in the AT Kearney FDI Confidence Index, thanks to reforms that helped to improve the business climate in Mexico.

Graph 7 - FDI Confidence Index: Ranking of top 25 countries, 2015



Source: AT Kearney, Foreign Direct Investment Confidence Index. Connected Risk: Investing in a Divergent World, 2015.

### Medium technology (MT)

- Chemicals.
- Machinery, professional tools, and domestic appliances.
- Electric-industrial machinery.
- Motor vehicles.
- Motorcycles and transportation.
- Railways and equipment.

### High technology (HT):

- Aircraft and space vehicles.
- Advanced materials.
- Computers and office machines.
- Communications equipment.
- Medical, precision, and optical equipment.

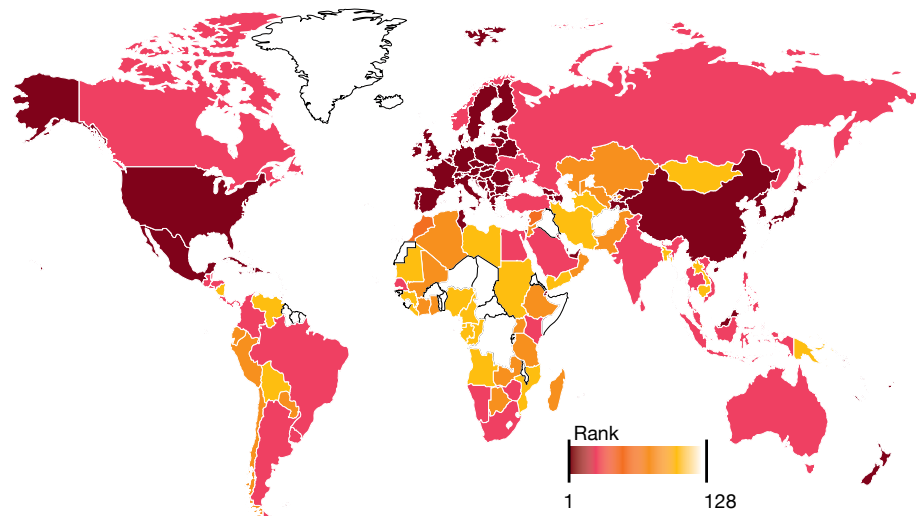
### High level of economic complexity

Mexico is in 20th place within 128 countries in terms of economic complexity according to a study by the Center of International Development at Harvard University in collaboration with MIT. It acknowledges that the country offers huge volumes of productive know-how. The country manufactures and exports large quantities of sophisticated goods.

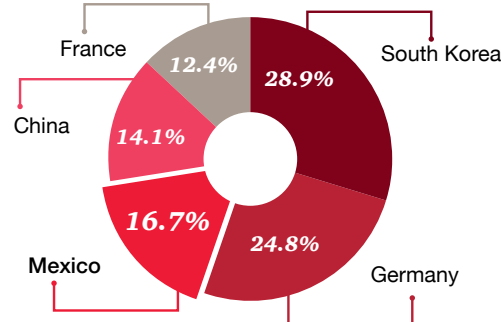
- 86.6% of Mexican exports were manufactured products in 2014<sup>30</sup>.
- Mexican exports have grown 28 times over the last 25 years<sup>31</sup>.
- The technological sophistication index of Mexico's export products (3.25) is the highest in Latin America; above those of India and Brazil<sup>32</sup>.
- 110,000 engineers graduate each year from science and technology programs<sup>33</sup>.

Source: INEGI, Harvard in collaboration with MIT, Atlas of Economic Complexity, 2013

Graph 8 - A technologically sophisticated economy



Graph 9 - Medium and high technology exports as a percentage of GDP (2012)



Source: IHS Data Global Insight: ProMéxico-Analysis

30 INEGI, Commercial balance of Mexico, January 2015.

31 ProMéxico, 2014.

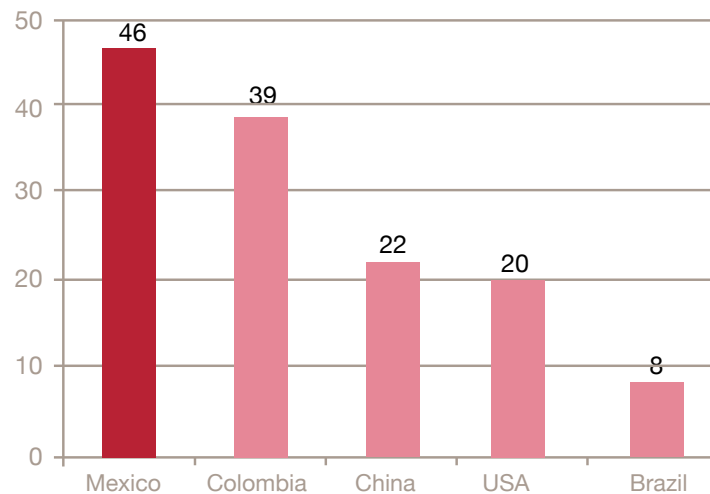
32 Atlas of Economic Complexity, published by the University of Harvard/MIT, 2014.

33 ProMéxico, 2014.

## Committed to free trade

Mexico has signed eleven free-trade agreements with access to 46 countries. It holds the second highest number of treaties in the world.

Graph 10 - Mexico has access to 46 countries through eleven free-trade agreements (1.2 billion people).



Source: Organization of American States, Ministry of Commerce of the People's Republic of China, Office of the US Trade Representative.

Note: Agreements signed and in force, does not include agreements in process of negotiation.

*Our treaties provide privileged access to 61% of world GDP.*

## Member of NAFTA

Mexico's exports to the US increased from 6.1% in 1990 to 12.5% in 2014 and are expected to reach 17.0% in 2018; China's figures for the same time-frame are 3.1%, 19.9%, and 15.8%; Canada 18.4%, 14.8% and 13.9%; Japan 18.1%, 5.7% and 5.4%, respectively<sup>34</sup>.

The US is one of Mexico's most important trading partners. Mexico was the second largest market for US exports in 2014 (Mexican imports) after Canada, and the third largest trading partner after Canada and China<sup>35</sup>.

Imports from Mexico to US amounted to US\$292.4 billion in 2014 compared to 2013, for a 1% increase of US\$14.8 billion, up 111% compared to 2003 and 632% compared to 1993 (pre-NAFTA).

Exportation of US goods to Mexico in 2014 totaled US\$192.7 billion; for an increase of 6.1% (US\$11 billion) compared to 2013, 97% compared to 2003 and 364% compared to 1993 (pre-NAFTA). US exports to Mexico accounted for 11.9% of overall US exports in 2014.

The five largest categories of Mexican exports to the US in 2014 were: auto parts (US\$38.9 billion), raw oil (US\$27.6 billion), buses (US\$27 billion), vehicles (US\$21 billion), and computers (US\$12.6 billion)<sup>36</sup>.

<sup>34</sup> Office of the US Trade Representative, Economist Intelligence Unit.

<sup>35</sup> U.S. Census Bureau, 2015.

<sup>36</sup> Idem.

Mexico has:

- More than 50 entry points to the US along the northern border.
- Trade within the NAFTA market equaled to almost US\$19.9 billion in 2014.
- US\$1 million per minute of bilateral trade with the US in 2013.

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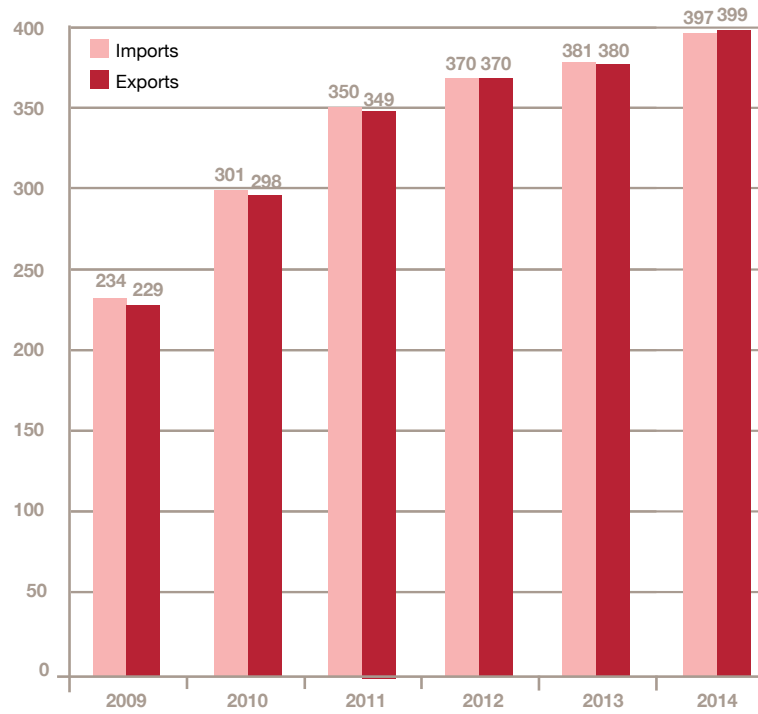
Graph 11 - NAFTA map

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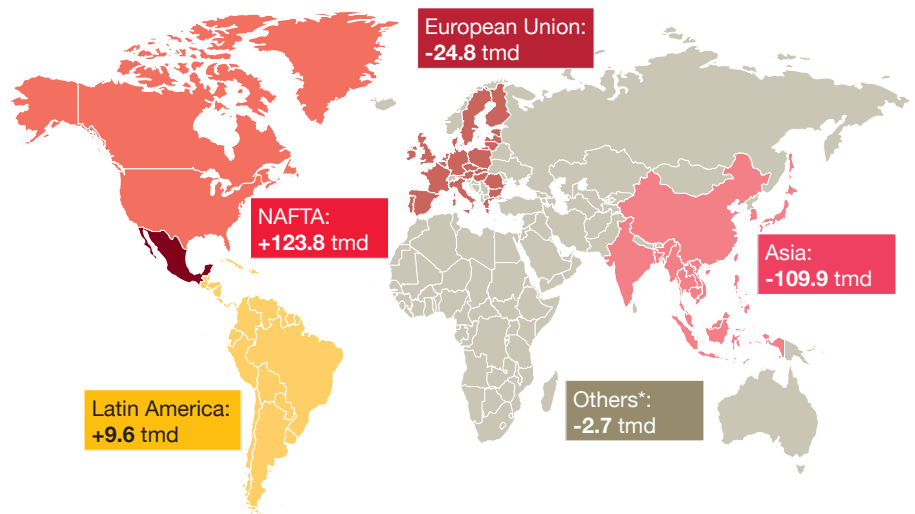
Source: ProMéxico.

Graph 12 - Balance of trade in billions of US Dollars



Source: Bank of Mexico, 2014.

Graph 13 - Mexico's trade balance with the world first quarter of 2015.\*



\* Includes Africa, Oceania and other European countries.

Source: Bank of Mexico 2015, "Global Trade Atlas".



## Low transportation costs

One advantage is Mexico's proximity to the world's main consumer centers, which reduces inventory costs and makes it possible for companies to react more quickly to changes in demand and reduce inventory costs. The table below shows the number of days required for sea transportation of a container from competing countries and from Mexico (columns) to important distribution and consumption centers (rows).

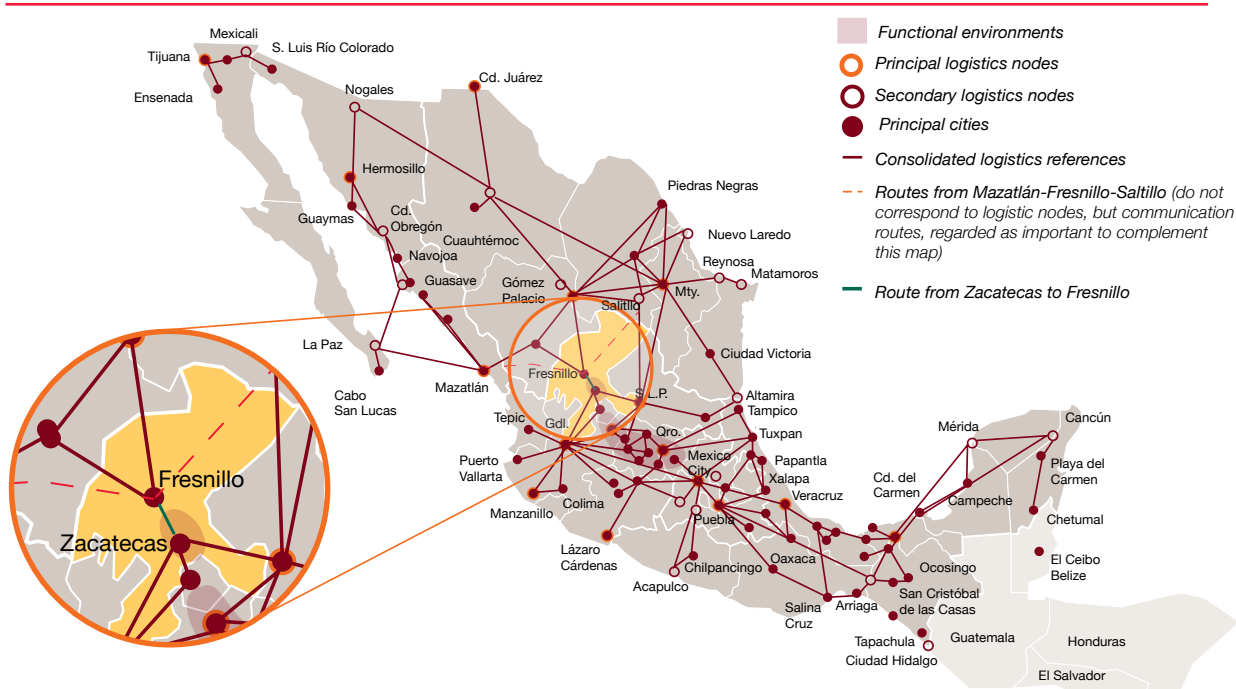
Days by sea to principal consumer centers										
	Germany	Brazil	China	Colombia	South Korea	USA	India	Mexico	Poland	Turkey
New York	11	15	32	6	21	-	25	5	12	16
Los Angeles	25	23	18	10	17	-	31	4	26	28
Rotterdam	-	17	32	15	33	11	20	16	1	10
Yokohama	35	35	4	24	3	15	17	19	36	27

Source: Boston Consulting Group.

## Logistic nodes

There exist in Mexico 42 logistic nodes; 16 and 26 of which are principal and secondary, respectively. Based on the National Study of Logistics Platforms by the Departments of Economy, and Communication and Transport – in collaboration with the Inter-American Development Bank (IDB) – another 85 potential logistics platforms have been identified in which investment is expected to eventually and gradually improve the logistics in transportation and decrease the corresponding cost that represents 14% of the final price of the product.

Graph 14 - Logistic nodes and links in Mexico



Source: IDB, National Logistics Platforms System 2013.

The Pemex Gas pipeline network is

**12,764 km long**

The pipeline transports a daily average of

**5.1 million cubic feet (Mcf\*)**

of natural gas and

**182,000 barrels**

of liquefied gas.

\*Mcf= thousand cubic feet  
Mcf= 1,000,000 BTU

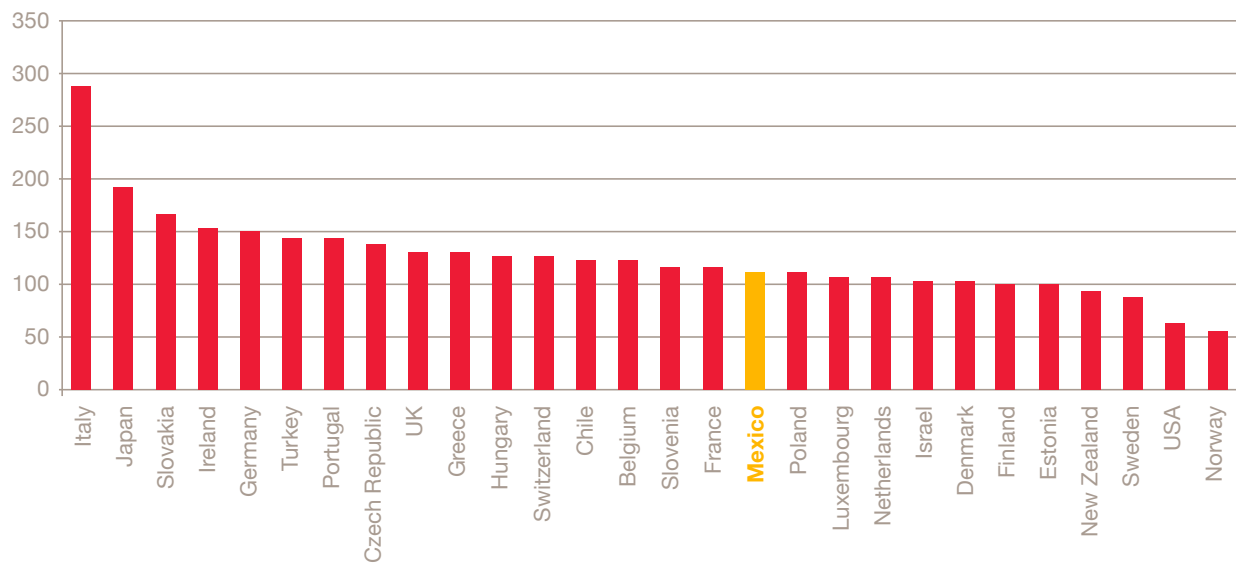
Source: Petróleos Mexicanos (Pemex).

### Highly competitive energy costs

As a complement to cost control, the 2013 edition of Key World Energy Statistics contains a list drawn up by the International Energy Agency (IEA) of annual average electricity rates per MWh for countries belonging to the Organization for Economic Cooperation and Development (OECD).

These figures show that the country with the highest electricity rates is Italy (291.79 dls/MWh), while Norway has the lowest rate (57.56 dls/MWh). The rate in Mexico is 114.76 dl/MWh, which puts it in 17th place among the countries included in the study. Chile is in thirteenth place with a rate of 126.7 dls/MWh.

Graph 15 - Energy costs by country, estimated by the OECD



Source: International Energy Agency, 2013.

**Note 1:** The following countries were excluded from the study because their information was not available at the time: Australia, Austria, Canada, South Korea, and Spain.

**Note 2:** Electricity rates in Mexico are similar for the industrial sector, except in the states of Baja California and Baja California Sur.

**Note 3:** See also Appendix V of this document with regard to competitive costs.

## Competitive energies: wind and photovoltaic power

In 2015, the tariffs applicable to the industrial sector started to decrease in comparison to 2014 between 27% and 36%, principally due to the decrease in the prices of the fuels used to generate electricity and the replacement of expensive and polluting production materials through investments in greener and cheaper sources of energy. Additionally from January to September 2015, the commercial sector tariffs decreased by 9%, and 17% in the case of the domestic sector with high consumption<sup>37</sup>.

Average solar energy production in Mexico is just over five KWh\* per square meter per day making it the third most attractive country in the world in that area. Generation capacity is estimated to be 6,500,000 GW\*, equivalent to approximately 27.7 times overall electricity consumption in Mexico in 2012. Mexico forms part of the so-called Sun Belt and is therefore among the principal countries with the greatest solar potential in the world. In late 2013, Mexico was among the first five countries worldwide in terms of installed capacity of geothermal energy (823.4 MW\*\*\*)<sup>38</sup>.

**kWh\* = kilowatt-hour = 1,000 watts per hour**

**MW\*\*\* = megawatt = 1,000,000 watts**

**GW\*\* = gigawatt = 1,000,000 kW**

**Mexico is the principal supplier of solar photovoltaic modules in Latin America, with an annual production capacity exceeding 737 MW.**

Source: ProMéxico.

Graph 16 - The photovoltaic potential in Mexico



Source: The National Meteorology Service.

Mexico enjoys greater wind resources than most countries in the world. The potential is estimated to be 40,268 MW, considering production factors higher than 20%.

The importance of this sector lies in the fact that it can offer energy at more competitive prices in the future.

Graph 17 - The wind potential in Mexico



Source: Electrical Research Institute.

37 Federal Electricity Commission (CFE for its acronym in Spanish), 2015.

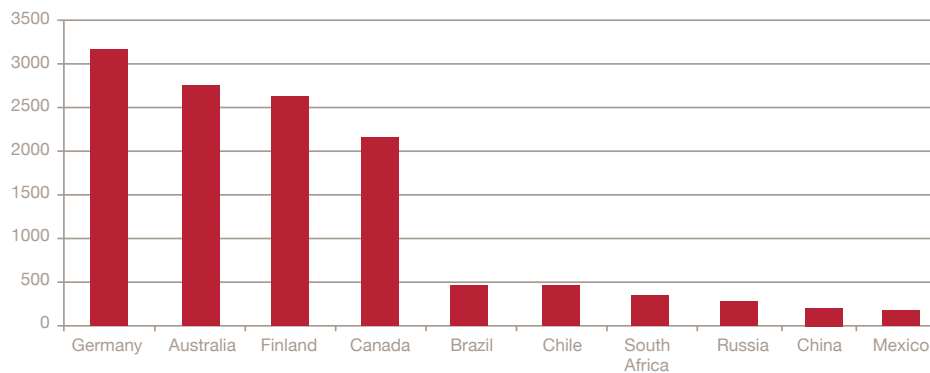
38 ProMéxico, 2013.

39 Idem.

## Competitive labor in Mexico

The World Bank, in its Doing Business 2015 publication, provides a list of minimum average monthly salaries for 200 countries. In this classification, Mexico is located with a minimum monthly salary of US\$174.5 in 2014. Within the emerging markets, Mexico is competitive. In comparison to China with a minimum salary from US\$245.39 to US\$286.29, Mexico fares well. This is another reason for Mexico being an attractive country for investments, especially in manufacturing.

Graph 18 - Minimum monthly salary in US Dollars for different countries (2014)



Source: World Bank, Doing Business 2015.

Note. The data for Germany is from International Labor Organization's report, 2012.

A study conducted by Michael Page in 2014 contains a table of remunerations showing the average annual salary for certain labor positions. The study, which focuses on Brazil, Mexico, and Chile, contains data pertaining to positions that can be compared to those for mining machinery companies and equipment suppliers.

Table - Remuneration by country, per position and division in 2013 (monthly salary in US Dollars)

Monthly remuneration by division and position 2013 (US Dollars)				
Division	Position	Brazil	Mexico	Chile
Property and construction	Director of Operations	12107-17937	9000-12000	10000-15000
Supply	Supply Chain Manager	4933-9865	4150-7000	8000-11000
	Purchasing and Production Manager	4036-8969	3150-7000	5000-11000

Source: Michael Page, 2013.

The study shows how attractive Mexico can be as an investment destination for suppliers to the mining industry related to production control and operating costs in the payroll area and it can be complemented with the following data:

The average daily salary for calculating social security dues by national activity sector (pesos)	
<b>Agriculture, cattle-raising, and fishing</b>	\$165.6
<b>The extraction industries</b>	\$485.9
<b>The transformation industries</b>	\$296.3
<b>Construction</b>	\$205.0
<b>The electricity and drinking water industries</b>	\$727.7
<b>Trade</b>	\$249.0
<b>Passenger and freight transportation</b>	\$348.4
<b>Social services</b>	\$286.3

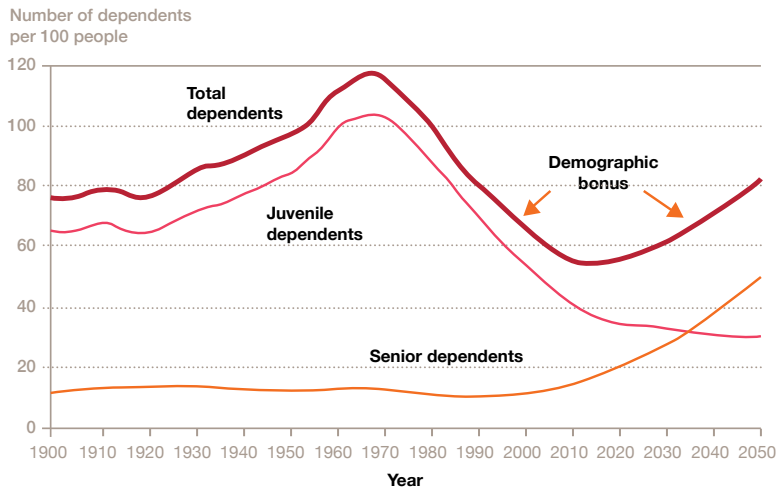
Source: The Labor Department, 2014.

Note: Pesos per day, annual average.

## Demography

By 2030, Mexico will enjoy the lowest index of economic dependence by infants and senior citizens. This will generate significant business opportunities, given the size of its internal market (based on the large number of economically active individuals) and available skilled human resources<sup>40</sup>.

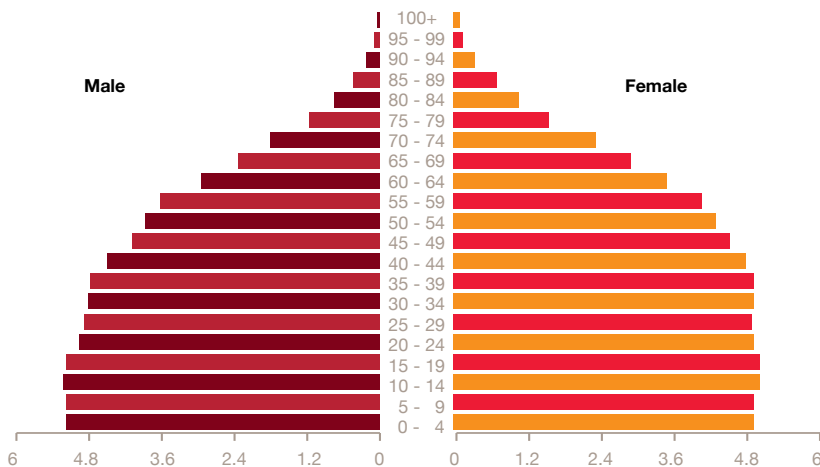
Graph 19 - The Mexico demoGraph bonus



Source: US Census Bureau, INEGI, 2014; National Council of the Population (Conapo for its acronym in Spanish).

Note: \* The Conapo defines the demographic bonus as a phenomenon arising from the transition where working age people (economically active) outnumber economically dependent people (children and senior citizens), thus boosting the production potential.

Graph 20 - Mexico population pyramid 2030 (millions of inhabitants)



- 123.8 million inhabitants; average age of 28 (2014)<sup>41</sup>.
- 52.4 million people comprise the economically active population (EAP) as of third quarter of 2014 <sup>42</sup>.
- Forecasts show that by 2050, there will be over 61 million people of working age <sup>43</sup>.

40 ProMéxico, Conapo.

41 The World Bank, 2015.

42 Conapo, 2014.

43 ProMéxico, 2014.

## Workforce quality

Mexico offers a very good quality and availability of labor and talent.

Among the ten emerging countries with a population larger than 75 million, Mexico occupies the third position (faring better than Brazil, China, and India) in the Talent and Human Capital 2015\* report.

Countrywide, more than 110,000 Mexican engineers graduate each year, which is more than in Germany, Canada, UK, and Brazil.

According to the Mexican Mining Chamber, the scholarship fund set up to assist students in Earth Sciences delivered 114 scholarships in 2013, of which 74 were for students and 40 were for teachers. Evaluation criteria provided by the twelve universities taking part in the trust indicate that registration, with 1,661 enrolled, increased 13% over 2013; and the number of students graduating, 535 in 2014, did not change; and the number of the ones receiving degrees, 266 in 2014, decreased by 10%.

\* World Economic Forum 2015.

## Examples of certain engineer graduates by area of study - Mexico 2012-2013

Specific area of study in Mexico	Graduates
Engineers specializing in motor vehicles, ships, and aircraft	1,704
Electricity and generation of energy	4,797
Manufacturing, multidisciplinary processes, and programs	3,169
Mining and extraction	718

Source: National Association of Universities and Higher Education Institutions (ANUIES, for its acronym in Spanish), 2014.



## Other stimulus for investment

- More than 70 double taxation treaties in effect (and fifteen in negotiation).
- Lower tax rates on temporary imports with Value Added Tax (VAT) certification.
- Programs for the promotion of innovation. These programs provide support to companies investing in projects for research and development of technology and innovation focused on new products, processes or services.
- The European Union Fund for Scientific and Technological Cooperation promotes scientific and technological research between Mexico and the European Union, in support of joint research projects, and the creation and strengthening of research networks<sup>44</sup>.
- Mexico has a moderate fiscal deficit and maintains a solid policy of public finances, aimed at recovering fiscal balance. The fiscal deficit goal for 2015 is 1.5%<sup>45</sup>.
- For 2015 a 2.4% growth in GDP is estimated<sup>46</sup>.

<sup>44</sup> ProMéxico.

<sup>45</sup> Bank of Mexico, 2015.

<sup>46</sup> Economic Commission for Latin America and the Caribbean (CEPAL, for its acronym in Spanish), July 2015.

### Key statistics

#### GDP:

**US\$1.3 trillion (2014)**

Source: World Bank.

#### GDP growth:

**4% in 2012\*\* , 1.1% in 2013\*\* , 2.1% in 2014\*\* , 2.4% in 2015 (projected)\***

Source: \*CEPAL.

\*\* The World Bank.

#### GDP per capita:

**US\$10,361 (2014)**

Source: World Bank.

#### Population:

**123.8 million (2014)**

Source: World Bank.

#### Inflation rate:

**4% (2014)**

Source: World Bank.

---

# *Chapter 1*

## Zacatecas, a growing state







*The state of Zacatecas has a great deal to offer. Its capital, also called Zacatecas, is one of the most beautiful colonial cities in Mexico. Thanks to its history and architecture, it has been declared a World Heritage Site by UNESCO.*

European-style historic, religious, civic, and cultural buildings can be found throughout the city, even among its narrow streets, alleyways, and plazas. Modern commercial centers have been built in the areas surrounding the historic center of the city. Zacatecas is clean and it is a comfortable location for visitors and investors.

As mentioned, its principal economic endeavors are mining, agriculture, cattle-raising, tourism, and culture. The state is known for its large silver and other mineral deposits, such as gold, copper, zinc, and lead.

The state of Zacatecas, situated in the center of Mexico, has a surface area of 75,539 square kilometers (km<sup>2</sup>), i.e. 3.9% of the total surface area of the country, occupying eighth place in national territory. It borders seven states: Coahuila to the north, Durango to the northwest, Nayarit to the west, San Luis Potosí and Nuevo León to the east, and Jalisco and Aguascalientes to the south. It has 10,319 km of roads, 671 km of railroads and an international airport where internal customs facilities are now being installed.

Also, important strides have been made in improving security.

### **General information**

**Municipalities: 58.**

**Altitude: 2,496 m.**

**Time Zone: UTC -6, UTC -5 in the summer months.**

Source: State Department of Tourism  
Note: UTC: Universal Coordinated Time

**Annual average rainfall: 534.5 mm (2014)**

**Maximum temperature: 25.9 °C annual (2014)**

**Minimum temperature: 8.9 °C annual (2014)**

Thanks to its privileged location in the center of Mexico, Zacatecas has never experienced an earthquake. Tsunamis and cyclones are also highly unlikely<sup>47</sup>.

<sup>47</sup> National Meteorology Service, 2014.

Note: Internal customs facilities with an in-bond warehouse. Located at specific points in Mexico, empowered to control incoming and outgoing merchandise and allowing the importation and exportation of goods subject to the different customs regimes.

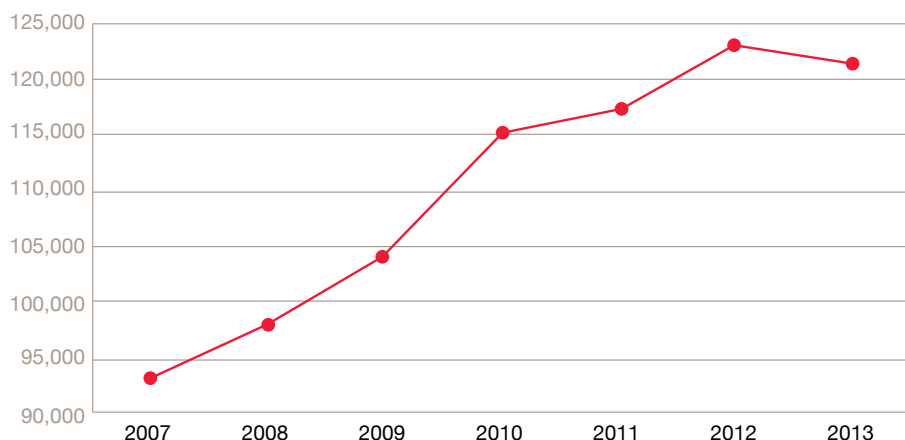
## Analysis of the economic environment

The history of Zacatecas goes hand-in-hand with mining. Even before the Spanish conquest, Chalchihuites, the most important archaeological zone in the state, along with la Quemada forming known as Chicomostoc, had a mining-based economy (turquoise and blue-green stone). During the colonial period, somewhere around 1546, a group of explorers led by Juan de Tolosa reached the ravine at the foot of the Bufa Mountain, where they discovered one of the largest veins of silver in New Spain.

Four years later, Vázquez de Mercado headed the first military foray north-east of the Zacatecas mines and confirmed the existence of other silver deposits in Ranchos, Chalchihuites and San Martín, Sombrerete<sup>48</sup>. That discovery made Zacatecas one of the most important mining centers in New Spain. Zacatecas is currently an outstanding mining center, both in Mexico and throughout the world. It forms part of the West-Central region, which comprises of dynamic and expanding entities.

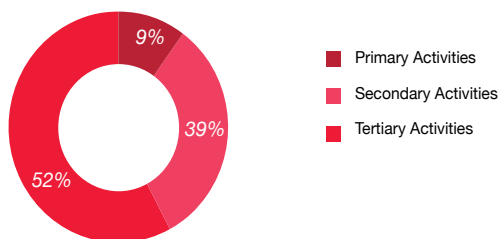
The West-Central region is composed of states with very high economic performance: Jalisco, the most industrialized, Guanajuato, Aguascalientes, and San Luis Potosí (to name a few) show strong growth trends.

Graph 21 - GDP at constant prices for the State of Zacatecas 2007-2013 (millions of pesos)



Source: Bank of Economic Information INEGI, National Accounts System. GDP by federal entity - millions of pesos.

Graph 22 - GDP structure of Zacatecas at constant prices - 2013



Source: INEGI.

Note:

**Primary activities** - Agriculture, animal husbandry, forestry, fishing, and hunting.

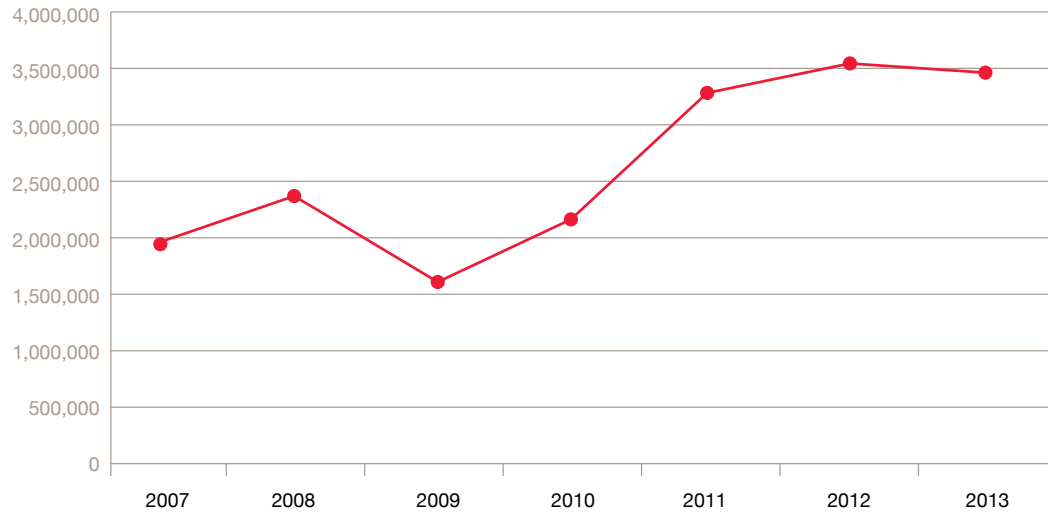
**Secondary activities** - Mining, the generation, transmission and distribution of electric energy; water and gas supply via pipeline to the end consumer; construction, and manufacturing.

**Tertiary activities** - Trade, transportation, postal services and warehousing; mass media information, financial and insurance services; real estate services and the leasing of goods and intangibles; professional, scientific, corporate and technical services; business support services, waste management and remediation services; education services, health service and social assistance; entertainment, cultural and sports services; other recreational services, tourism (hotels and restaurants and related services), except government activities.

<sup>48</sup> Flores, de Vega, Kuntz y Alizal, Brief history of Zacatecas, Economic Culture Fund, Mexico, 1996.

It is interesting to consider the conditions favoring the economic growth, because it takes us back to the important role played by mining, which is the source of the major part of the state's economic tendency, linked to the exportation of metals and merchandise.

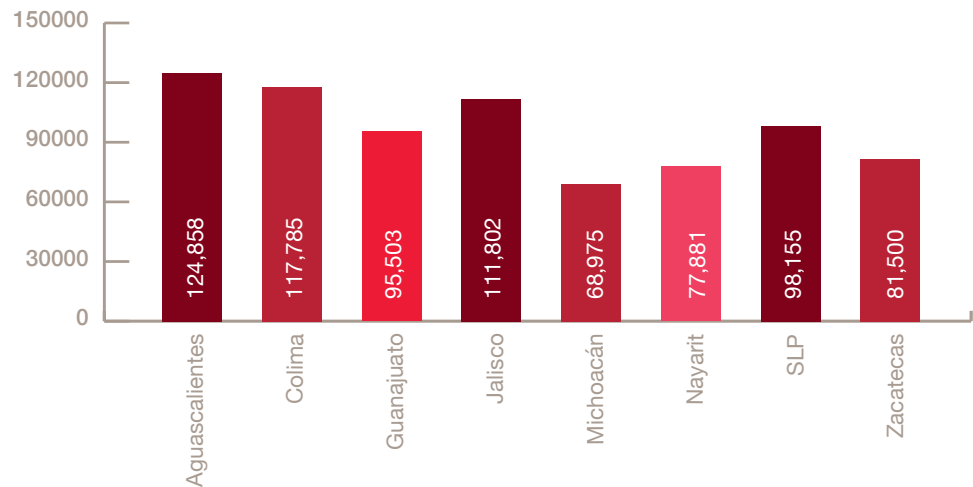
Graph 23 - Total exports for the State of Zacatecas (thousands of US Dollars).



Source: Bank of Economic Information INEGI. Total exports by federal entities.

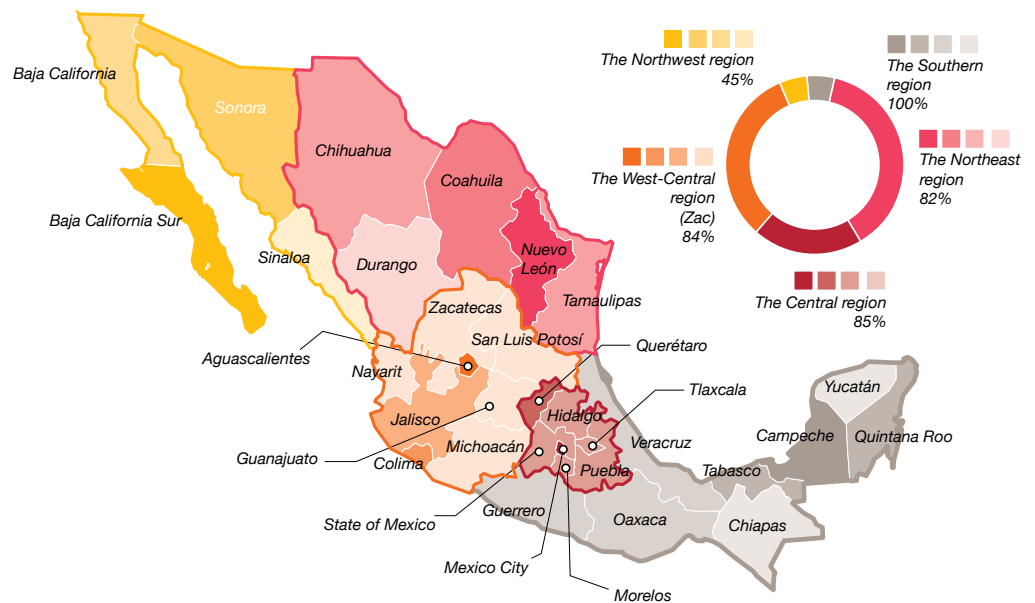
The question then arises: what are the conditions facilitating the economic growth? As mentioned, growth springs from an advantageous location within Mexico, which is connected to the principal ports and economic centers of the country by its extensive network of roads and rail lines. However, there are other conditions directly favoring growth, such as levels of workforce quality and well-being, demonstrated by access to hospitals and Social Security services, logistic nodes, and even indirectly (but significantly) the state's well-grounded culture expressed in the form of festivals, history, and museums.

Graph 24 - GDP per capita at constant prices for the West-Central region - 2013 (Pesos).



Source: Bank of Economic Information INEGI, National Accounts System.

Graph 25 - Level of development in GDP per capita at 2013 constant prices (including oil revenue)



Source: Bank of Economic Information INEGI, National Accounts System.

When comparing the GDP for the West-Central region to that of other regions, we found that the Southern region has achieved 100% development, followed by the Central and West-Central region, with 85% and 84% – all of them in an advanced development stage.

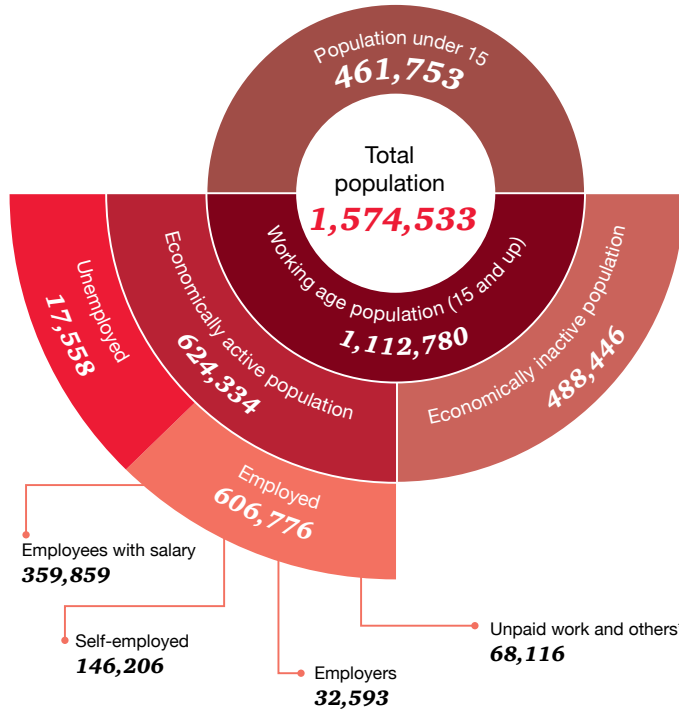
The potential for the state of Zacatecas is significant, because its mining operations (its principal activity) can be further boosted by the development of other industrial activities to compete with other states. Furthermore, Zacatecas has a mining cluster and tourism cluster is being developed (with focus on strengthening hotels and restaurants). Training in tourism capabilities at public schools is planned, as well, seeking sources of financing for public and private bodies that will guarantee the social purpose of that program. Also, there are plans to develop an automotive cluster.

Zacatecas' GDP is only a third of Sonora's (30.7%), its closest mining benchmark; i.e., the GDP of Sonora is 395,445 million pesos compared to that of Zacatecas, at 121,491 million. However, it is noteworthy that per capita GDP in Zacatecas is 81,500 pesos; i.e., 54% of Sonora's, which is 148,525 pesos, hence showing better income distribution<sup>49</sup>.

49 INEGI, National Accounts System.

When observing the unemployment rate in Zacatecas, we note that it is below the national average, i.e., 4.4%<sup>50</sup> in the second quarter of 2015. It can therefore be concluded that 97.2% of its Economically Active Population (EAP) were employed in the second quarter of 2015<sup>51</sup>.

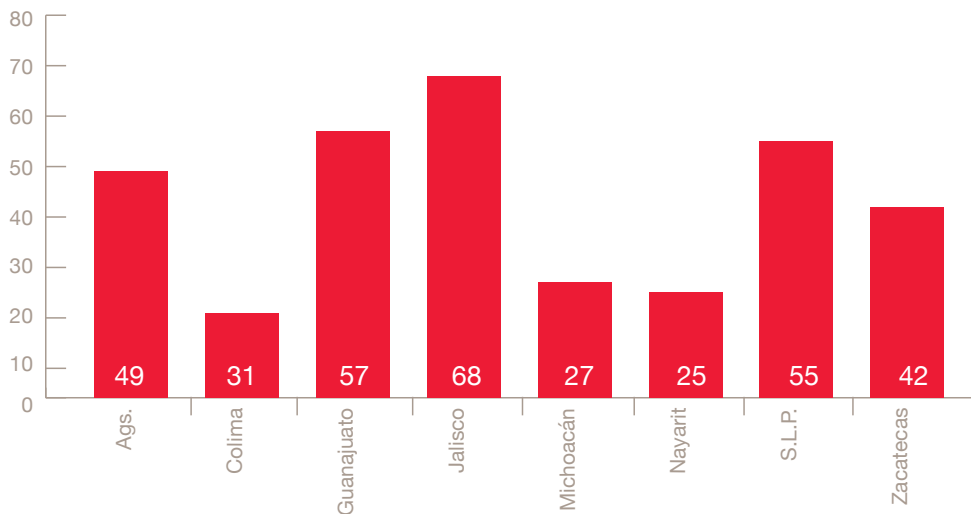
Graph 26 - Distribution of the Zacatecas population. Second quarter of 2015



\*\*Note: Persons involved in support of carrying out activities that help them get their livelihood or their families, in whole or in part, without receiving any compensation in return, either money or property that can be exchanged in the market.

On the other hand, because the growth rate for the state is in direct proportion to the state productivity index, while certain sectors show high performance, the state of Zacatecas is nearing productivity indexes similar to those of Aguascalientes.

Graph 27 - State Productivity Index for the West-Central region 2011



Source: ProMéxico.

50 National Occupation and Employment Survey- Bank of Economic Information INEGI, second quarter of 2015.

51 Idem.

## Renewable energy industry

Zacatecas itself has a wind potential of 800 to 1,500 MW.

Furthermore, a wind park is to be installed in Zacatecas that will guarantee a supply of 130 MW of clean energy for the two Volkswagen plants in Mexico, located in the city of Puebla, and Silao in Guanajuato. That supply is the equivalent of 70% of the energy required by those two plants, thus cutting down on the emission of approximately 140,000 tons of carbon dioxide per year.

During the construction period, that wind project will generate 300 direct jobs, and once finished, 60 permanent jobs. That wind park represents an investment of US\$350 million. Equally, there are other projects in initial stages that will generate more than 200MW of electricity from wind and solar sources.

As a result of Italian promotion of Zacatecas, in August 2015, construction of a wind farm by Italian company ENEL Green Power began in the municipalities of Mazapil and Villa de Cos. It is the first Italian investment in the state and is estimated at US\$ 220 million. It is expected to start its operation in the first half of 2016. ENEL Green Power will generate sustainable and competitive energy from Zacatecas that will supply two large companies with a domestic presence and supply points throughout the country. During the construction phase, around 500 jobs will be generated and during the company's useful life – projected to be 20 years – between 50 and 100 direct and indirect jobs will be created to maintain the farm.

Source: Department of Energy, The Department of the Economy of the state of Zacatecas.

Therefore, it can confidently be stated that mining in Zacatecas could easily find itself soaring if it consolidates other industries that will favor the mining cluster and drive the creation of other industrial parks.

Conditions are favorable for generating new industries in the state that will strengthen the mining sector and the state economy, as demonstrated by the most recent edition of the World Bank's Doing Business 2014, which points out that Zacatecas is in seventh place regarding ease of doing business in the country.

Another point in favor of Zacatecas is that it is in first place in Mexico regarding the resolution of commercial disputes owing to contract non-compliance (248 days at a cost of 22.6% of the overall cost of the lawsuit in question). This same process requires 404 days in England. If the global "Doing Business 2014" report measured Zacatecas rather than Mexico City, it would place 23rd among 189 economies, i.e., 48 positions above the Federal District<sup>52</sup>.

Table - Zacatecas Property Registry

Indicator*	Zacatecas	Latin America and the Caribbean	OECD
<b>Procedure (number)</b>	6.0	7.0	4.7
<b>Time (days)</b>	22.0	63.0	21.8
<b>Cost (% of property value)</b>	3.2	6.1	4.2

Source: World Bank, Doing Business in Mexico 2014, Doing Business in Mexico 2016.

Table - Contract compliance in Zacatecas

Indicator**	Zacatecas	Latin America and the Caribbean	OECD
<b>Time (days)</b>	248.0	736.9	538.3
<b>Cost (% of the disputed amount)</b>	22.6	30.8	21.1
<b>Procedure (number)</b>	37.0	39.8	31.5

Source: World Bank, Doing Business in Mexico 2014, Doing Business in Mexico 2016.

\* **Procedures (numbers)** Total number of procedures required to register property. A procedure is defined as any interaction between the purchaser and the vendor, their agents (when an agent is legally required in practice) and third parties.

**Time (days):** Total number of days required to register property. Measurement includes the average time indicated by expert attorneys in the purchase or sale of real property and notaries or Property Registry officials as necessary to complete a procedure.

**Cost (% of property value):** Cost is recorded as a percentage of the property value, which is presumed to be equivalent to 50 times per capita income. Only official costs required by law are used.

\*\* **Time:** Days for settling a dispute, from the point at which the lawsuit is filed at the court to the date on which payment is made. Includes the dates on which the lawsuit is conducted as well as periods between the different phases.

**Cost (% of the disputed amount):** Legal costs and attorney fees (when attorneys are required or are necessary in practice), expressed as a percentage of the amount sued for.

**Procedure (number):** The average number of procedures required for a contract to be complied with. The list of procedures involved in each economy shows the chronological order of the phases of a commercial dispute handled in a competent court.

52 World Bank, Doing Business in Mexico 2014, Doing Business in Mexico 2016.

## Economy

Zacatecas has a stable economy; its GDP is 121,491 million pesos (approximately US\$9.5 billion in 2013)<sup>53</sup>.

Zacatecas received US\$96.5 million in FDI, accounting for .4% of the FDI received in Mexico in 2013. The principal target for FDI in Zacatecas in 2014 was the manufacturing industry<sup>54</sup>.

In the last five years, Zacatecas has received approximately US\$2 billion in FDI related to mining, which is approximately 90% of the total FDI in Zacatecas.

The state boasts three industrial parks (Parque Industrial Calera, Parque Industrial Fresnillo, and Parque Industrial de Guadalupe), and has five more under development, i.e. Célula Industrial Jerez, Célula Industrial la Zacatecana, Complejo de naves microindustriales la Zacatecana, Parque Industrial Aeropuerto SUMAR 1, and Parque Industrial Osiris.

The industrial parks are strategically located in areas close to the population, airports, roads, sources of water, and schools. In addition, they comply with all the official Mexican norms for industrial parks and have access to the road network, which facilitates the transport of goods to different states of Mexico.

The 2011-2016 Development State Plan of Zacatecas presents as one of its strategic goals the creation of a Science and Technology park, whose construction began in August 2015. It aims to improve the scientific capacities of the upper level students institutions, the research centers, and technological innovation capacity already located (or being a catalyst for the creation of new companies) in Zacatecas as a result of entrepreneurial ideas or practices<sup>55</sup>.

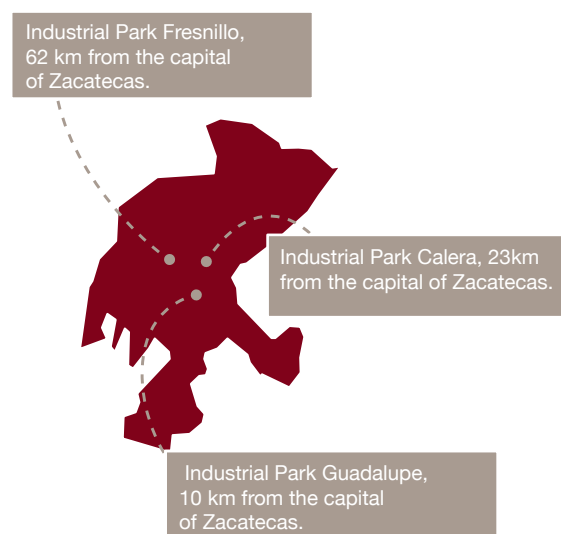
## Breweries

*In March 1997, ABInBev started up operations. It was the eighth brewery built in Mexico and the largest and most modern in Latin America, with installed capacity of 20 million hectoliters (hL).*

*ABInBev plans to make Zacatecas the beer capital of Mexico and of the world by means of a series of joint actions with the state government.*

Source: ABInBev.

Graph 28 - The location of industrial parks in Zacatecas



Source: The Department of the Economy of the state of Zacatecas.

53 The Department of the Economy of the state of Zacatecas, 2015.

54 Idem.

55 Idem.

## The Aerospace Industry

*The US company, Triumph Group Inc., is an example of a success case within the aerospace sector and has a collaboration agreement with Universidad Tecnológica del estado de Zacatecas to train its workers.*

Source: The Department of the Economy of the state of Zacatecas.

## The automotive sector

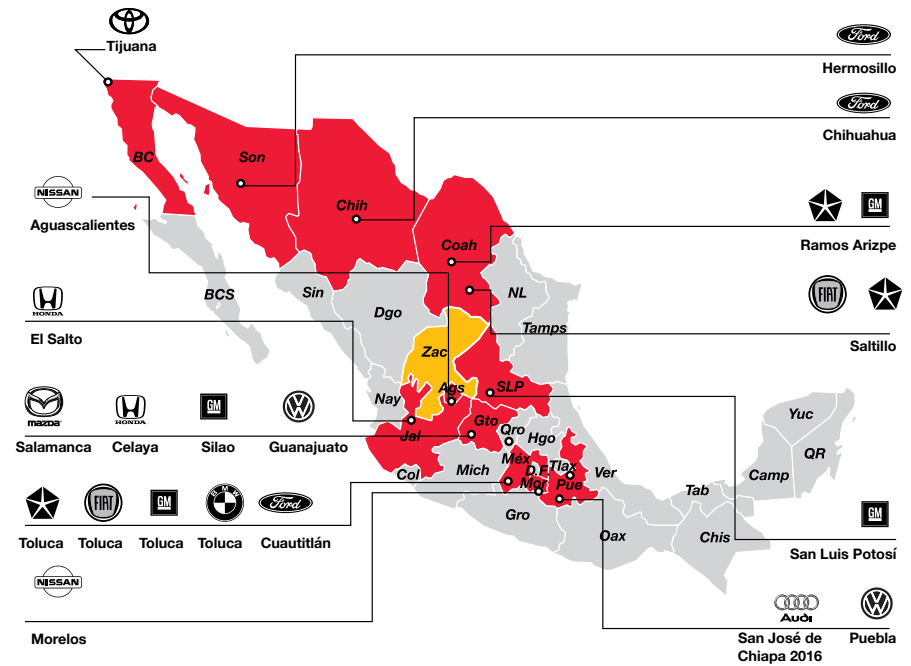
Zacatecas is attractive for the automotive industry due to its proximity with the Bajío region (states of Aguascalientes, Querétaro, and Guanajuato). Within a radius of 320 km, there are seven assembly plants of the sector, as well as, ten auto parts companies within the state.

In the last three years, 145 automotive projects have arisen in Bajío for a total investment of approximately US\$7 billion, which has generated 47,000 jobs.

Zacatecas has consolidated its position in this sector together with Bajío.

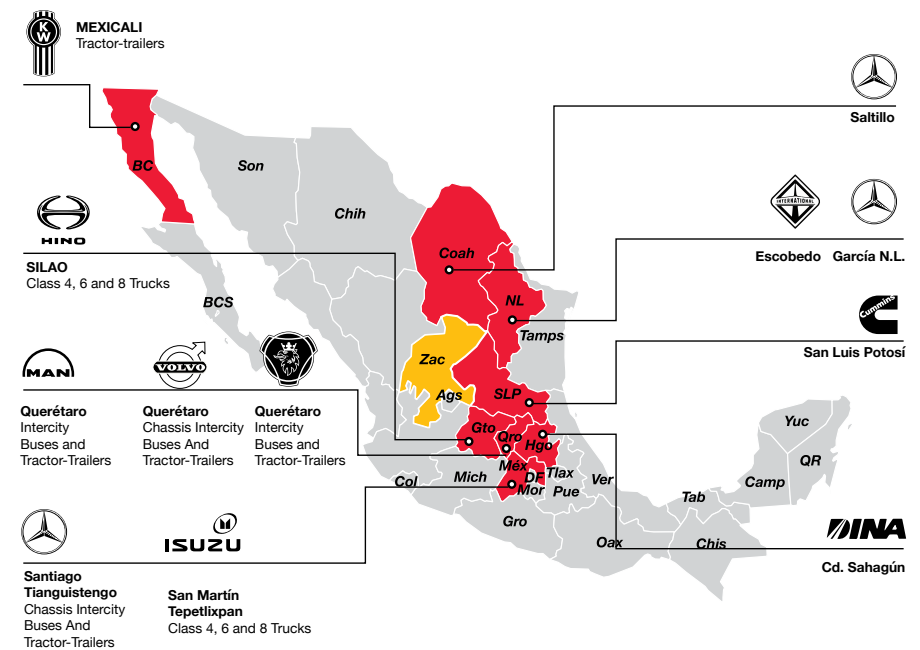
Four vehicle manufacturing plants are located on this rail line between Guanajuato, Aguascalientes, and Zacatecas: Mazda, General Motors and two Nissan plants<sup>56</sup>.

Graph 29 - Location of Light Vehicle Plants



Source: ProMéxico.

Graph 30 - Location of Heavy Vehicle Plants



Source: ProMéxico.

Five auto parts companies are expected to invest in Zacatecas: Murakami that will manufacture rear view mirrors; KCF with cold forged production; Nagakura with transmission production; Yulchon with shock-absorbing production; and Linamar that will produce axles.

Source: Government of state of Zacatecas, 2014.

56 Díaz, Ulises, "Bajío attracts 7 mddd", Diario Reforma, May 6, 2015.



To support economic growth, the Zacatecas Investment and Employment Act was passed in 2012, which is designed to formalize public support policies and foster economic activity aimed at achieving economic growth in the state. It also considers the creation of an investment incentives fund amounting to 50 million pesos per year. The incentives provided for in the law are shown in the following table:

Table - Investment incentives in Zacatecas

Tax	Economic	Non-monetary
a. Up to 100% exemption from payroll tax.	a. Economic incentives for the training of workers.	a. Advice on the installation, startup and operation of a company or its expansion.
b. 100% exempt from state fees.	b. Economic incentives for building entire or partial infrastructure works that will drive the installation or expansion of a company.	b. Handling procedures with the federal, state or municipal authorities.
	c. Economic incentives for the installation or connection of basic utilities such as water, drainage, gas, and energy.	c. Assistance in managing public or private financing.
	d. Economic incentives for conducting studies or research.	d. Providing a connection between investors and the authorities, universities, unions, suppliers, companies, and in general, individuals or entities of interest to a company.
	e. Economic incentives for the acquisition (via purchase, leasing, etc.) of real property on which to establish a company.	e. Worker training provided by the state government.
	f. Providing state-owned real property on which to establish a company (via donation, purchase, leasing, bailment agreements or any other legal means).	f. Actions aimed at the internationalization of a company.
		g. Actions required to develop suppliers.

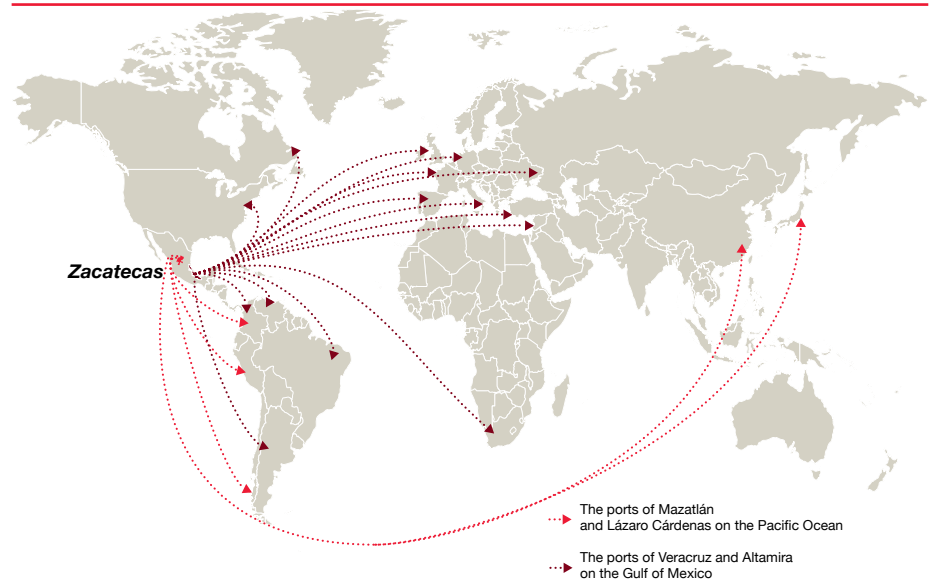
Source: Zacatecas Investment and Employment Act.

## State connectivity

There are other key aspects that should be considered by those interested in the state of Zacatecas. First is its outstanding location in Mexico, as it is connected to the main ports and economic centers of the country by its ample network of roads. Second, the state invests significantly in culture, health, and education (in relation to the number of universities and students). Even more significant is the commitment of the current government to drive economic growth and social development within the state.

Given its strategic position, the state of Zacatecas has access to the principal cities in the country, including important ports such as Mazatlán and Lázaro Cárdenas on the Pacific Ocean; Veracruz and Altamira on the Gulf of Mexico.

Graph 31 - Examples of the destination of exports leaving through selected ports



Source: Prepared with data from the Annual Port Statistics of the Department of Communications and Transport.

In addition to good connections to the most important cities and regions in Mexico, Zacatecas is linked by air to Chicago, Dallas, and Los Angeles; and by road and railway to various strategic destinations.

Zacatecas' international airport, General Leobardo C. Ruiz, serviced 259,677 passengers in 2013, and 284,625 in 2014<sup>57</sup>.

The State Economic Development Council is coordinating efforts with the different parties involved in providing infrastructure for the Zacatecas Customs Section located at the international airport. Because of this, Zacatecas will be in a position to handle customs procedures with less dependence on border and port customs houses<sup>58</sup>.

57 The Zacatecas International Airport.

58 The Department of the Economy of the state of Zacatecas.

Graph 32 - Zacatecas air transit



Source: The Department of the Economy of the state of Zacatecas.

Graph 33 - The principal interstate road networks



Source: The Department of the Economy of the state of Zacatecas.

The Pan-American Highway is a system approximately 25,800 km long, linking almost all the countries of the Western Hemisphere via a single uninterrupted stretch of highway. In Mexico, the Pan-American Highway is one of the principal federal roads. This is a historically important highway because it connects the large markets in the center of Mexico to the north of Mexico and southern USA, through Ciudad Juárez. That route is indispensable for the regional integration of Zacatecas, Durango, and Chihuahua<sup>59</sup>.

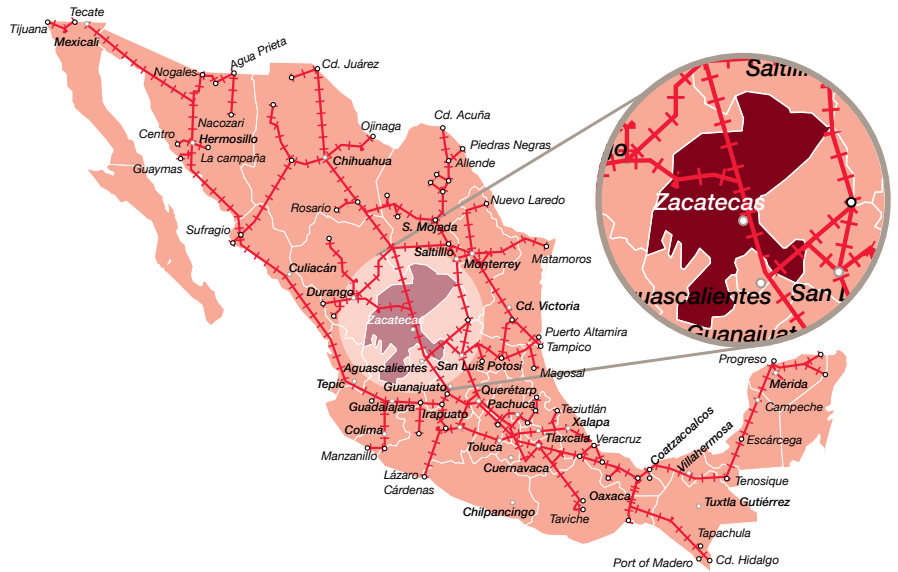
Graph 34 - The Pan-American Highway



Source: National Conference of Governors National Committee of Regional Development.

59 The Department of Communications and Transportation; National Conference of Governors National Committee of Regional Development.

Graph 35 - The principal interstate railroad networks



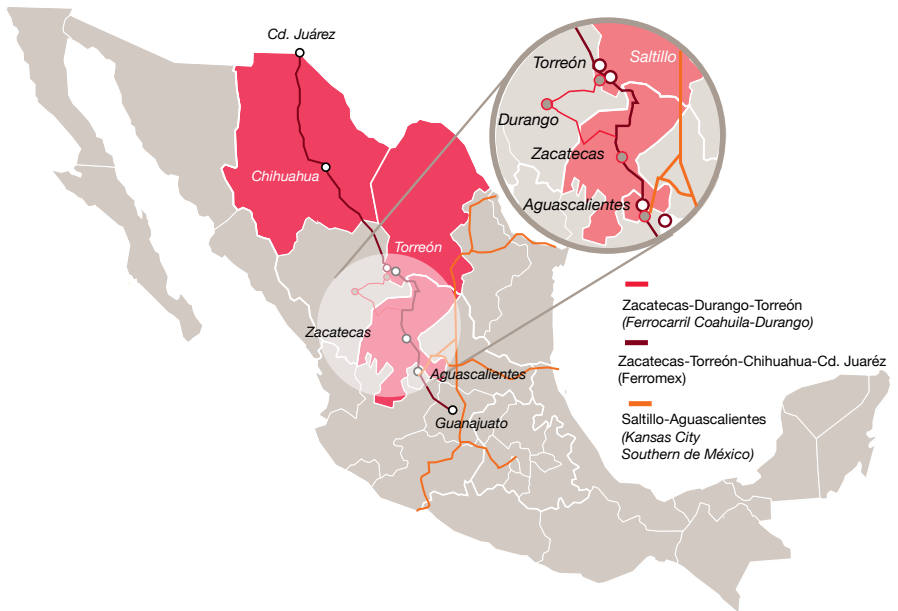
Source: The Department of the Economy of the state of Zacatecas.

Table - Infrastructure in the state of Zacatecas

<b>Railways (km)</b>	<b>671</b>
Main and branch lines	584
Secondary	81
Private	5
<b>Seaports</b>	<b>0</b>
High seas and coastal trade	0
Coastal trade	0
<b>Airports</b>	<b>1</b>
Domestic	0
International	1

Source: The Department of Communications and Transport.2014, Annual Statistics Report per entity of INEGI,2013.

Graph 36 - The Zacatecas-Torreón-Chihuahua Railway



Source: Ferromex, Kansas City Southern de México

Likewise, the railway companies Ferromex, Coahuila-Durango, and Kansas City Southern de México operate in Zacatecas.

Zacatecas is among the top six states in terms of budget allocation for road maintenance, together with Michoacán, San Luis Potosí, Sinaloa, Sonora, and Veracruz.

The Northwest region has the second largest network of federal roads with 9,546 km, thus achieving advance stage in development.

Table - Road length in Zacatecas

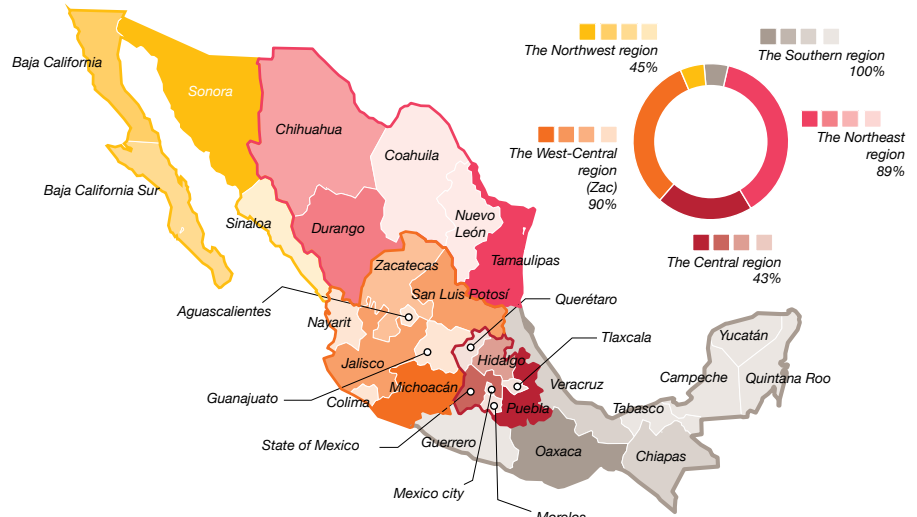
Type of road	Surface (kilometers)		
	Four or more lanes	Two lane	Total
Main toll highway network	32	62	94
Main toll-free highway network	572	916	1,488

Source: The Department of Communications and Transport.

It could be said that the investment in roads is one of the key factors in building a sustainable and long-term economic scenario. For example, on June 18, 2014, the state of Zacatecas requested the registration of 27 road projects, which, added to the 41 projects delivered on July 13, 2013, totaled 68 projects as of June 2014<sup>60</sup>.

The “Eje Transversal Interoceánico” (Transverse Interoceanic Highway) allows for better connections through the states of Tamaulipas, Nuevo León, Coahuila, Durango, Chihuahua, Zacatecas, and Sinaloa. The distance from the port of Mazatlán to Zacatecas is 595 km and travel time is approximately seven hours. The distance from the City of Zacatecas to Tampico is 600 km; travel time is approximately seven hours<sup>61</sup>.

Graph 37 - Stage of development on the federal road network (paved federal network by federal entity) as of December 2014



Note: Taking into consideration the total measurement of federal roads in relation to the total land area of the economic regions, the stage of development of each region would be as follows: Central, 100%; South, 90.5%; Central-West, 90.2%; Northwest, 45%; and Northeast, 44.58% — the first three at advanced stage of development.

Source: The Department of Communications and Transport.

Graph 38 - The Mazatlán-Durango-Zacatecas-Tampico Highway



Source: National Conference of Governors.

60 Government of Zacatecas, 2014.

61 National Conference of Governors.

The states of Sinaloa, Durango, Chihuahua, Zacatecas, Coahuila, Nuevo León, and Tamaulipas are linked by the Mazatlán-Matamoros Inter-Oceanic Economic Corridor. That macro-region comprises a market of 20 million people, including more than 60% of the trade flow in North America. The region's GDP exceeds that of Malaysia, and is 20% higher than Chile's and eight times higher than Panama's.

Aside from the Interoceanic Highway, the Mazatlán-Matamoros Corridor is connected to the NASCO Corridor (North America's Super Corridor Coalition), which strengthens the strategic position of the states of Sinaloa, Durango, Chihuahua, Zacatecas, Coahuila, Nuevo León, and Tamaulipas as a natural bridge between the US and the Pacific Ocean<sup>62</sup>.

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62 National Conference of Governors.

## Gas pipeline network

The state government has decided to enlarge and modernize industrial and service infrastructure to consolidate the state economy and business activities, as well as to create new investments. The 174.8 km Centennial Gas Pipeline was inaugurated as part of the festivities related to the Centennial of the “Taking of Zacatecas”. The pipeline cost 680 million pesos to build, 100 million of which was contributed by the state government. That pipeline resulted in an estimated 30% reduction in natural gas prices paid by users. It has a capacity of 20 million British Thermal Units (BTU) with possibility to increase up to 40 million BTU<sup>63</sup>.

Graph 39 - Mexico's gas pipeline network

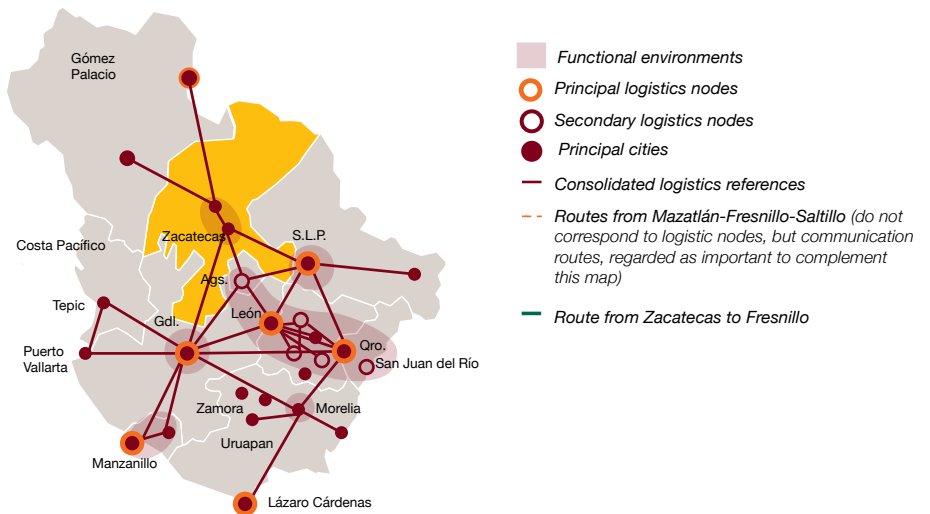


Source: Secretary of Energy.

## Logistic nodes

The West-Central region has eight logistic nodes: five principal (31% of the total and first place in Mexico) and three secondary<sup>64</sup>.

Graph 40 - Logistic nodes for Zacatecas and the nearest cities



Source: Inter-American Development Bank (IDB), National Logistics Platforms System 2013.

63 Fourth part of the state address issued by Governor Manuel Alonso Reyes, 2014.

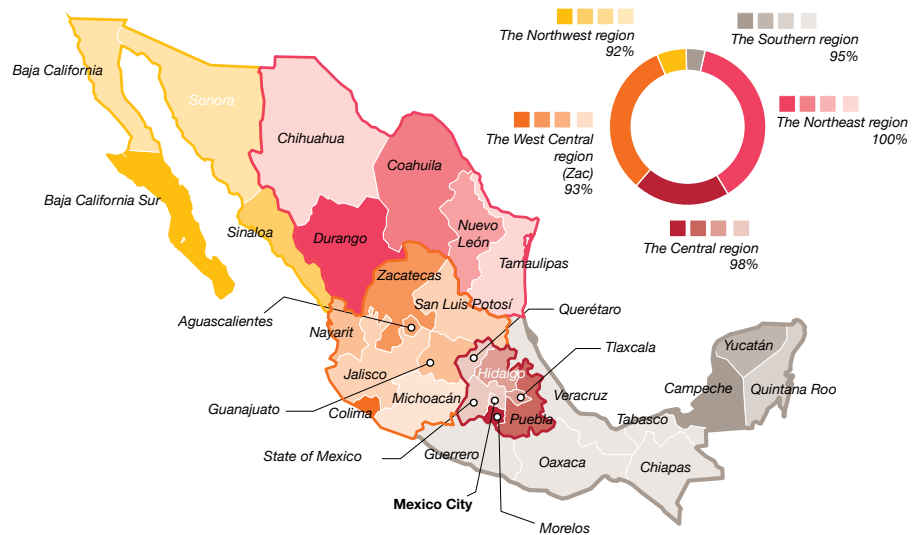
64 National Study of Logistics Platforms, The Inter-American Development Bank, and the Department of Communications and Transport, 2013.

## Workforce quality in Zacatecas

Zacatecas is fully committed to education and offers numerous options for institutions of higher education for each 100,000 inhabitants. Hence, Zacatecas is one of the states with an important development stage.

In the 2012-2013 academic year, 39,487 undergraduates were enrolled in Zacatecas, of which 11,252 specialized in engineering, manufacturing, and construction.

Graph 41 - Stage of development regarding the number of higher education institutions per 100,000 inhabitants - 2013-2014 academic year.



Source: Prepared by PwC, with data provided by the Department of Public Education.

Zacatecas has 49 universities and upper high level education systems, including:

- Universidad Autónoma de Zacatecas (UAZ).
- Instituto Tecnológico de Zacatecas (ITZ).
- Instituto Tecnológico de Estudios Superiores de Monterrey (ITESM), Campus Zacatecas.
- Universidad de la Veracruz (UNIVER).
- Universidad Interamericana para el Desarrollo (UNID).
- Universidad Politécnica de Zacatecas (UPZ).
- Universidad del Desarrollo Profesional (UNIDEP).
- Universidad Autónoma de Durango (UAD).
- Instituto Politécnico Nacional (IPN).
- Universidad Tecnológica del Estado de Zacatecas (UTEZ).
- Universidad Autónoma de Fresnillo (UAF).

### Upper-level student population 2012-2013

Zacatecas	Registered	Graduates	With Degree
<b>Total upper technical level</b>	39,487	6,075	5,185
<b>Agronomy and veterinary medicine</b>	1,280	212	89
<b>The arts and humanities</b>	1,743	372	196
<b>Natural, exact, and computer sciences</b>	2,517	256	234
<b>Social sciences, administrative sciences, and law</b>	14,840	2,622	1,938
<b>Education</b>	2,596	476	536
<b>Engineering, manufacturing, and construction</b>	11,252	1,490	1,347
<b>Health</b>	5,106	647	845
<b>Services</b>	153	0	0

Source: National Association of Universities and Higher Education Institutions (ANUIES for its acronym in Spanish), 2014.



### **Student population at the upper technical level 2012-2013**

<b>Zacatecas</b>	<b>Registered</b>	<b>Graduates</b>	<b>With Degree</b>
<b>Total upper technical level</b>	1,710	636	461
<b>Agronomy and veterinary medicine</b>	0	0	0
<b>The arts and humanities</b>	52	72	0
<b>Natural, exact, and computer sciences</b>	3	3	0
<b>Social sciences, administrative sciences, and law</b>	294	92	86
<b>Education</b>	9	11	0
<b>Engineering, manufacturing, and construction</b>	998	331	331
<b>Health</b>	290	127	44
<b>Services</b>	64	0	0

Source: National Association of Universities and Higher Education Institutions (ANUIES), 2014.

### **Students registered and graduating in the mining and extraction area in Zacatecas, by institutes 2012-2013**

	<b>Registered</b>	<b>Graduates</b>
<b>Zacatecas</b>	<b>713</b>	<b>34</b>
<b>Instituto Tecnológico Superior de Zacatecas Occidente</b>		
Technical Mining Engineering	147	16
<b>Unidad Académica de Ciencias de la Tierra</b>		
Metallurgist Mining Engineering	328	18
<b>Universidad Tecnológica del Estado de Zacatecas</b>		
Upper Technical Mining University Graduate	238	0

Source: National Association of Universities and Higher Education Institutions (ANUIES), 2012-2013.

### **Professional studies taught at medium education schools in Zacatecas 2012-2013**

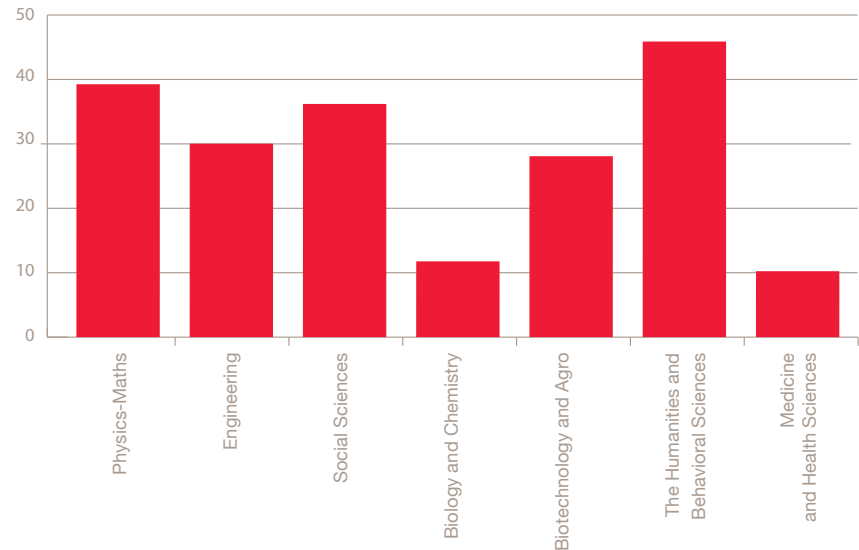
<b>Degrees</b>	<b>Registered</b>	<b>Graduates</b>	<b>With Degree</b>
Electromechanical engineering	259	32	36
Mechatronics	892	202	181
Electronics	66	14	3
Electricity	187	21	27
Industrial engineering	950	165	102
Industrial processes	139	22	13
Industrial maintenance	62	33	33
<b>Total</b>	<b>2,555</b>	<b>489</b>	<b>395</b>

Source: The Zacatecas Department of the Economy 2012-2013.

As of January 2015, 21,316 researchers were registered in Mexico, of which .9% correspond to Zacatecas.

Most researchers in the state of Zacatecas specialize in the Humanities and in Physics-Mathematics Sciences<sup>65</sup>.

Graph 42 - Number of researchers in Zacatecas by specialty - 2015



Source: National Researcher System, National Council for Science and Technology (CONACyT for its acronym in Spanish)

Universities have also become involved with the mining and government sector in an effort to attract research projects that will encourage their teachers and students to come up with solutions to mining problems. For example, in 2014, 115 Earth Sciences research projects were generated, 23 of them in Zacatecas occupying the first position by federative entity.

Other significant efforts have been made to attract scientists. Schools and universities attract young researchers to handle projects having to do with the mining sector. For example, in 2013, the Zacatecas Council for Science, Technology and Innovation (COZCyT, for its acronym in Spanish) engaged scientists of the highest level in the areas of mathematics, telecommunications, cosmology and software engineering. They did this in order to increase and strengthen the creation, application, and knowledge associated with state priority areas.

The National Bank of Mexico (Banamex, for its acronym in Spanish) and the Mexican Institute for Competitiveness (Imco, for its acronym in Spanish) gave recognition to the capital of Zacatecas as the city with the best performance in the category, “Cities from 100,000 to 500,000 inhabitants”, during the third edition of Competitive and Sustainable Cities Index 2015. The corresponding evaluation is comprised of 127 indicators and assess the main 78 urban areas of the country that includes more than 400 municipalities.\*

\*Imco

65 National Researcher System, National Council for Science and Technology (CONACyT).

## Competitive salaries in Zacatecas

The average daily salary in Zacatecas (used as a basis for calculating Social Security dues) in 2014 was 245.3 pesos (US\$18.50) per day, which is below the Mexican average of 282.1 pesos (US\$21.28<sup>46</sup>)\*.

Graph 43 - Average daily salary for calculating Social Security dues, by federal entity - 2014



Source: The Labor Department, 2014

\*Note: The above salaries in US Dollars calculated with the exchange rate of 2014.

46 The Labor Department, 2015.

## Quality of life

Zacatecas is among the states with the lowest cost-of-living in Mexico. According to the Annual Cost of Living Survey for 2013, Zacatecas scored 72.3%. This places the state in fourth place nationally, which is among the lowest average cost of living of the cities considered in the survey.

Generally speaking, Zacatecas has good quality of life. Prices for utilities, rentals, restaurants, and services in general are lower than those in other cities in the country and people have access to a good lifestyle considering the cost of goods and services.

## Security

Thanks to the efforts of the state and federal governments, the crime index has been brought down from 11.35% in 2010 to 11% in 2014<sup>67</sup>.

According to the National Victimization and Perception survey (ENVIPT, for its acronym in Spanish), the perception of poor security is gradually being brought down. This can be seen by comparing the 73.5% level for 2010 to 66.4% for 2012, for a reduction of 7.1%, almost achieving the goal of reducing ten percentage points in the citizenry's perception of insecurity<sup>68</sup>.

The goal of designing and applying the new police model has been achieved; 1,484 policemen were evaluated, 434 of which were approved as highly qualified officers, which exceeds the goal of 422.

The government of the state of Zacatecas has made an unprecedented investment of approximately 2.5 billion pesos in military bases and regional security units (UNIRSE, for its acronym in Spanish). The new infantry battalions and four regional security units will cover the entire territory of Zacatecas<sup>69</sup>.

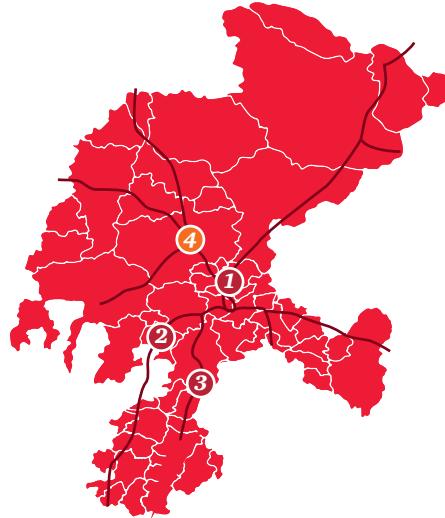
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67 Fourth part of the state report issued by Gov. Miguel Alonso Reyes, 2014.

68 Idem

69 The Department of the Economy of the state of Zacatecas.

Graph 44 - Zacatecas military bases



### Military bases:

- 1** **Guadalupe** Operating  
**Location:** Carretera Federal No. 45, Zacatecas, capital of the state.

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- 2** **Tlaltenango** Operating  
**Location:** Carretera Federal No. 23 towards Jalisco.

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- 3** **Jalpa** Operating  
**Location:** Carretera Federal No. 54 towards Guadalajara.

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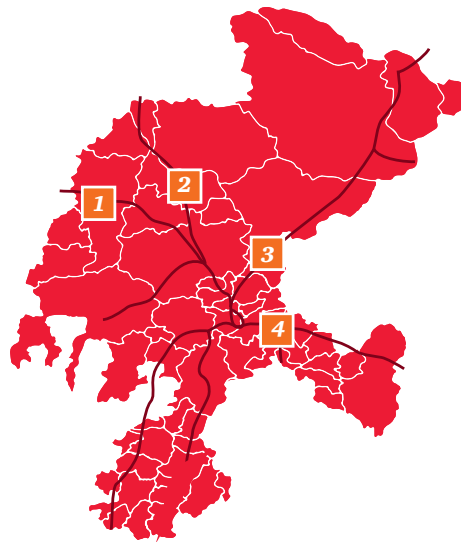
- 4** **Fresnillo** Operating  
**Location:** Carretera Federal No. 45 towards the northeast of the state.

The following personnel are assigned to each base:

Guadalupe: 500 active    Fresnillo: 500 active  
Tlaltenango: 500 active    Jalpa: 250 active

These military bases and the UNIRSE are security posts on the main roads in the state, permanently manned by 50 federal police and 20 army personnel. Security cameras and cutting-edge information systems have been installed.

Graph 45 - Regional Security Units (UNIRSE)



### Regional Security Units (UNIRSE)

- 1** **Sombrete** Operating  
**Location:** Carretera Federal No. 45, Zacatecas, capital of the state.

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- 2** **Río Grande** Operating  
**Location:** Carretera Federal No. 23 towards Torreón.

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- 3** **Villa de Cos** Operating  
**Location:** Carretera Federal No. 54 towards Saltillo.

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- 4** **Las Arcinas** Operating  
**Location:** Carretera Federal No. 49 towards San Luis Potosí.

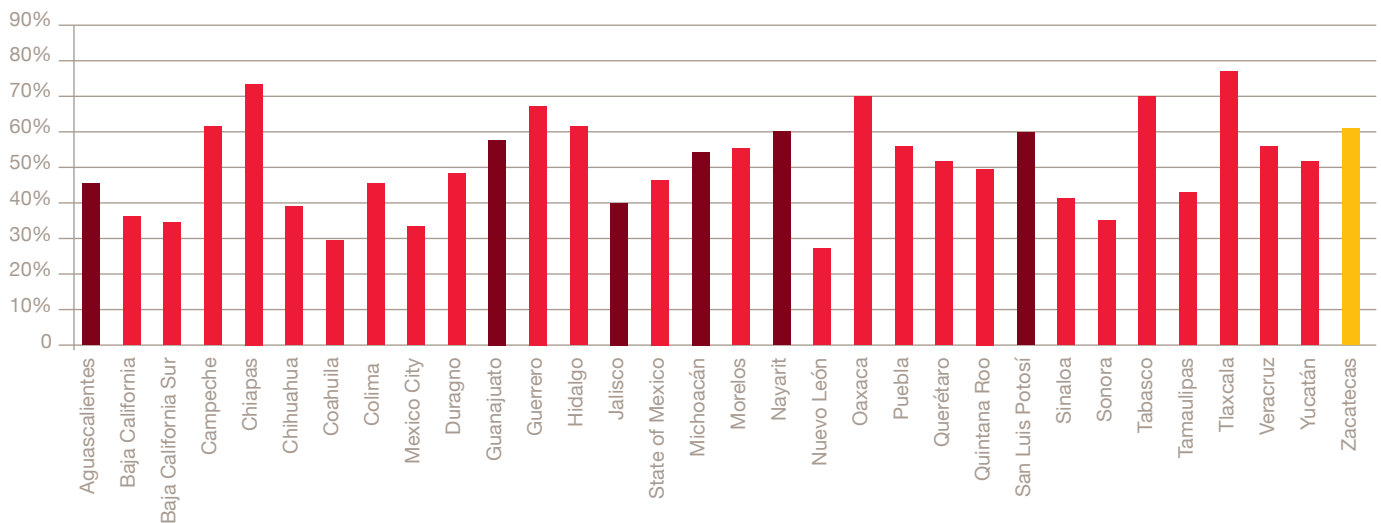


## Health

Zacatecas has achieved a 93% stage of development in the construction of public hospitals, one of the most important in Mexico. It also boasts an adequate supply of private hospitals, offering a window of opportunity that could gradually consolidate as the state becomes more and more industrialized.

Zacatecas stands out thanks to its popular insurance coverage\*; i.e., there has been a significant increase in the percentage of the population (whether working or not) with access to that type of insurance. This has increased the level of general well-being, thanks to the efforts of the state.

Graph 46 - State Popular Insurance Coverage 2013



Source: National System for Social Health Protection, Health Department, December 2013.

\*Note: The popular insurance is a public and volunteer medical service that offers preventive medicine services, external consultation, hospitalization and surgeries for the population non enrolled in the customary social security institutions and that prevents families from spending high quantities for health services.



## *Tourism and culture*

While Zacatecas has many archeological sites, it is best known for its baroque buildings, financed by local investment during the centuries-long boom in the mining industry. Zacatecas' cultural heritage is also evident in its many important museums and cultural festivals. Its cultural history is undeniable and is reflected in the number of cultural centers per one hundred thousand inhabitants.

Zacatecas is number one in the country, with 3.69, in terms of the number of cultural centers per 100,000 inhabitants. The number of tourist attractions makes the state even more appealing, given the number of “Magical Towns” that abound there. Furthermore, in 1993, UNESCO declared the Capital's Historical Center a World Heritage Site.

The state of Zacatecas has 5 magical town and is located above the national average which is 2.66, besides it has 2.28 museums to every one hundred thousand inhabitants, more than Mexico City, which has 1.68 for every one hundred thousand inhabitants, reflecting the importance the state places on culture.

As for sports, the state has two golf courses: Club de Golf Zacatecas and Fresnillo Club de Golf. The latter is the site of the annual golf tournament organized by Sandvik Mining, one of the most prestigious in Mexico because of the prize provided by the sponsors.

As far as shopping goes, Zacatecas has two malls: Galerías Zacatecas, located in the capital; and Centro Comercial Visión, located in Fresnillo.

## *Archeological sites*

Nearby Zacatecas, La Quemada and Altavista are the most well known archeological sites in the region. La Quemada is the largest pre-Hispanic settlement located 56 kilometers of south of the Zacatecan capital. There, its modern on-site museum houses a scaled model, approximately one square kilometer in size, of how the city looked during its heyday<sup>70</sup>.

Altavista, also known as Chalchihuites – a náhuatl word that means “precious stone” – was a ceremonial and astronomical center created by Súchil branch of the Chalchihuites culture, whose occupation and development lasted around 800 years (200-1000 a.c.). This center boasts archeological treasures that include la Plaza de la Luna (or the Plaza of the Moon), the votive pyramid, the Gamio staircase, and the Maze; where tourists can appreciate timely birds-eye views of seasonal equinoxes.

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<sup>70</sup> VisitMexico

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## ***Chapter 2*** **Mining**





# Mining overview

## Mexico is among the principal mineral producers in the world

In 2014, Mexican production was estimated at 92 tons of gold, 4,700 tons of silver, 520 thousand tons of copper, 700 thousand tons of zinc and 220 thousand tons of lead. Mexico maintained competitive production levels in 2014 compared to the global level, as shown below:

Mineral	Position
Silver	1
Gold	9
Copper	10
Lead	5
Zinc	6

In addition, it maintained its position within the top 16 in twelve other minerals and metals.

Source: US Geological Survey, Mineral Commodity Summaries 2015.

## Mineral reserves in Mexico

Mexico is an important destination for mining investment, because of its significant mineral resources and reserves. It is within the top thirteen in terms of reserves of the principal metals<sup>71</sup>. Mexico offers a great opportunity for mining suppliers to manufacture their goods, develop a supply chain and export to the rest of Latin America and the world.

<sup>71</sup> US Geological Survey, Mineral Commodity Summaries 2015.

Table - Metal reserves in Mexico, 2014

World Reserves			Mexican reserves	Position worldwide in the level of reserves
Ore	Unit of measurement			
<b>Copper</b>	Cu	Thousands metric tons of copper content	38,000	4°
<b>Gold</b>	Au	Metric tons of gold content	1,400	13°
<b>Lead</b>	Pb	Thousands metric tons of lead content	5,600	5°
<b>Silver</b>	Ag	Metric tons of silver content	37,000	6°
<b>Zinc</b>	Zn	Thousands metric tons of zinc content	16,000	4°

Source: US Geological Survey, Mineral Commodity Summaries 2015.



Mexico remained appealing to investors despite the higher taxes levied on the Mexican mining industry in the 2013 tax reform (effective as of 2014) and decrease in the metal prices.

Graph 47 - Changes in tax legislation



Source: PwC – prepared in-house

The tax reform eliminates accelerated depreciation and the deduction of exploration expenses in the year in which they are incurred. These expenses must now be deducted using the straight-line method over a ten-year period<sup>72</sup>.

Average percentage decrease in gold, silver, and copper prices from 2013 to 2014

**Minerals**

<b>Gold</b>	<b>10%</b>
<b>Silver</b>	<b>20%</b>
<b>Copper</b>	<b>6.4%</b>

Source: Statistical Yearbook of the Mexican Mining Industry, 2014.

In 2014, exploration investment worldwide for US\$11.4 billion showed a decrease of 25% compared to 2013.

In the same year, Latin America attracted 27% of global mining exploration investment, which still makes the region the main destination in the world for mining investment<sup>73</sup>, thanks to its ease of doing business and social development.

In the above context, Mexico continues to be the main destination for mining exploration investment in Latin America equal to Chile, and is ranked third worldwide, similar to Chile and USA.

<sup>72</sup> Government of Mexico.

<sup>73</sup> Mexican Mining Chamber (Camimex), Annual Report, 2015.

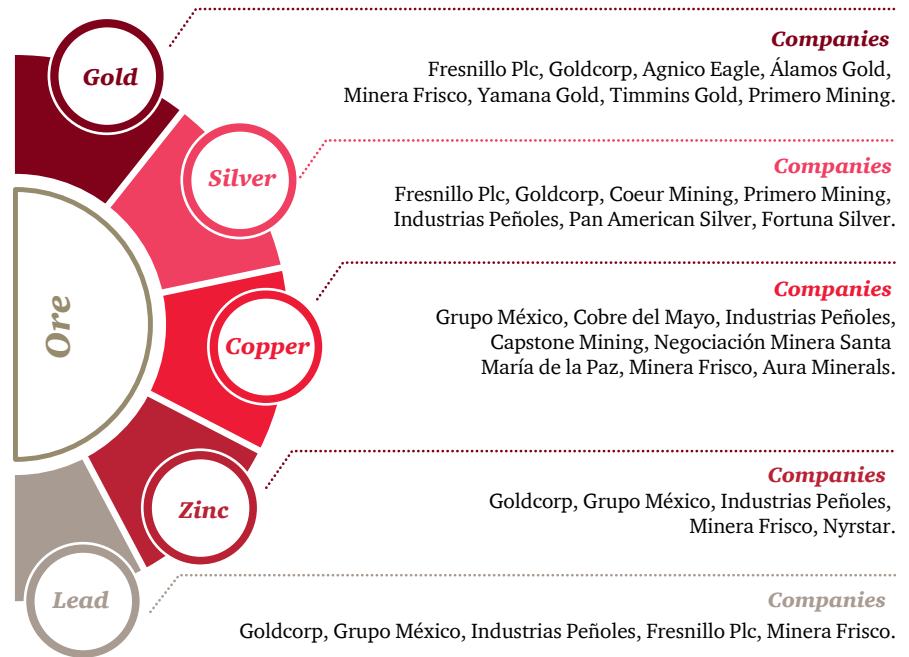
\* In the 2015 annual report of Camimex, some concern is shown because of the decrease in exploration as it is regarded a key activity for the continuity and competitiveness of the mining sector.

In 2014 alone, Mexico managed to attract US\$856 million to the sector (US\$912 million in 2013)\*, which goes to show the huge mining potential of the country, of which 70% (close to 1.3 million km<sup>2</sup>) is estimated to be suitable for mining operations\*\*.

Major mining companies invest in Mexico; domestic and foreign entrepreneurs take a chance on exploiting the Mexican subsoil, creating new jobs and boosting the regional and national economy. Some of the main mining groups are shown in the following table.

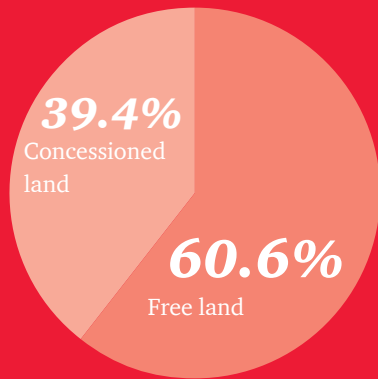
\*Camimex, Annual Report, 2015;  
\*\*Baker and McKenzie publication.

Graph 48 - Mexico's main mining companies



### Concessioned and free areas of the state of Zacatecas

In the state of Zacatecas they have a total of 2,875 existing mining concessions as of September 30, 2014; which cover an area of 2.9 million hectares.



Source: Mining landscape of the state of Zacatecas, Mexican Geological Survey.

### Some challenges:

In the Camimex 2015 Report, among other things, the mining sector advocated:

- Legal certainty and an adequate and stable regulatory framework that encourages and supports high levels of investment.
- An improvement in the financial and legal security of land tenure.
- Public policies; strengthen the rule of law, as building solid and efficient institutions contributes to the well-being of the population and better economic performance in general.
- Taxes: The mining sector has been one of the most productive sectors in recent years as well as one that has brought most investments to the country. As a result, the importance of the mining sector and its cyclical nature should be recognized. A heavy tax burden compromises long-term investments, mainly in the export sector.

- Declaration of natural protected areas: There are a number of draft decrees on Natural Protected Areas as well as priority areas for the conservation of a safeguard zone where mining concessions exist that confer the constitutional right to explore, exploit and benefit from them. These concessions have developed work and activities necessary to exercising that right.

It should be recalled that Mexico has high geological potential and an obvious mining vocation. These challenges are reflected in the indicators of the “2014 Annual Survey of Mining Companies”, published by the Fraser Institute, which lowered Mexico several positions in some indicators, including political perception, investment attractiveness, and tax incentives.

Based on these indicators, among others, the current Zacatecas government is working to foster a favorable climate for mining businesses.

## *Zacatecas: a privileged destination for mining investment*

From 1993 to 2013, mining projects were started, maintained, and expanded that benefited the economy at both the local and the national level. That growth was reflected in the following new projects: twelve in gold, eight in silver, seven in copper; as well as, the expansion of 22 projects throughout the country.

However, a drop in metal prices resulted in delays for 129 new local projects in 2014<sup>75</sup>. In spite of somewhat dismal scenarios for the sector, August 2014 saw approval of the Energy Reform. It is designed to modernize the Mexican energy sector by making it more competitive and guaranteeing better prices for Mexicans and the industry.

Under that reform, mining companies may sign contracts for the exploration and extraction of natural gas contained in coal deposits and produced in the same areas where coal is mined, which can now be done by means of direct contracts, without the need to engage in bidding processes.

The new Electricity Industry Law makes it possible for consumers with a minimum aggregate demand (initially 3 MW) to acquire their electricity in a competitive market. Companies deciding to opt for that formula will be known as Qualified Users (this option is also available to mining companies). By having the option to choose from multiple suppliers (or go straight to the market), Qualified Users will be able to bring down their electricity expense by selecting the most competitive prices. Furthermore, users may contribute to their Corporate Social Responsibility goals by contracting renewable energy<sup>76</sup>.

It is worth noting that the secondary laws passed under the Energy Reform added qualifications concerning preferential fees for mining exploration and exploitation, which will have no effect on hydrocarbon exploration and extraction.

Another benefit for the sector is that areas that had or have mining allocations with gas potential associated with coal deposits may be considered reserved areas<sup>77</sup>.

In spite of the sometimes gloomy scenarios faced by the mining industry, Zacatecas' mineral production remains one of the largest in Mexico, going all the way back to the pre-Columbian era. The Spaniards founded Zacatecas after discovering one of the state's biggest silver deposits.

Zacatecas is a national and international benchmark in the silver production; in 2013 it produced 39% of the silver total production in Mexico, being the state with the largest production<sup>78</sup>. Aside from silver, the state produces other minerals such as gold, mercury, iron, zinc, lead, bismuth, antimony, salt, copper, quartz, kaolin, onyx, quarry stone, cadmium, and wollastonite. As a result of the sector's development, Zacatecas is one of Mexico's main mining states. In 2012 and 2013, it contributed 22% and 18% of Mexico's total mining production, respectively<sup>79</sup>.

*Additionally, over the last ten years, investment in the Mexican mining sector reached **US\$39.4 billion** (US\$4.1 billion in 2014)<sup>74</sup>.*

74 Mexican Mining Chamber, Annual Report, 2015.

75 Idem.

76 PwC analysis of the energy reform, 2014.

77 PwC, Energy Reform: Summary of hydrocarbon bylaws bill, May 2014.

78 Statistical Yearbook of the Mexican Mining Industry, 2014.

79 Statistical Yearbook of the Mexican Mining Industry, 2013-2014.

The importance of the sector to the state and national economy is acknowledged by the government of Zacatecas, which promotes concrete actions favoring the development, investment, and strengthening of the mining sector, from tax incentives to agreements with universities, state government representatives and joint efforts with academia and entrepreneurs in an effort to achieve the goals established in the 2011-2016 Economic Sector Development Program, which strives to increase mining activity for the economic benefit of the state.

State tax incentives available to the mining sector focus on the exploration and exploitation of metal and non-metal minerals. The state government also has allocated funds for supporting the region's mining industry.

The Secretary of Economy of the state of Zacatecas was recently appointed President of the Mining Committee of the Mexican Association of Economic Development Secretaries.

According to Camimex's 2015 and 2014 annual report, Zacatecas' share of the domestic production of certain metals in 2014 and 2013, respectively, was as follows.

Ore	% National participation	
	2014	2013
<b>Gold</b>	<b>23.1</b>	<b>16.3</b>
<b>Silver</b>	<b>41.0</b>	<b>39.0</b>
<b>Copper</b>	<b>9.1</b>	<b>10.5</b>
<b>Zinc</b>	<b>42.6</b>	<b>41.6</b>
<b>Lead</b>	<b>52.8</b>	<b>51.7</b>

Source: Mexican Mining Chamber, Annual Report, 2014-2015.

### Mining success story

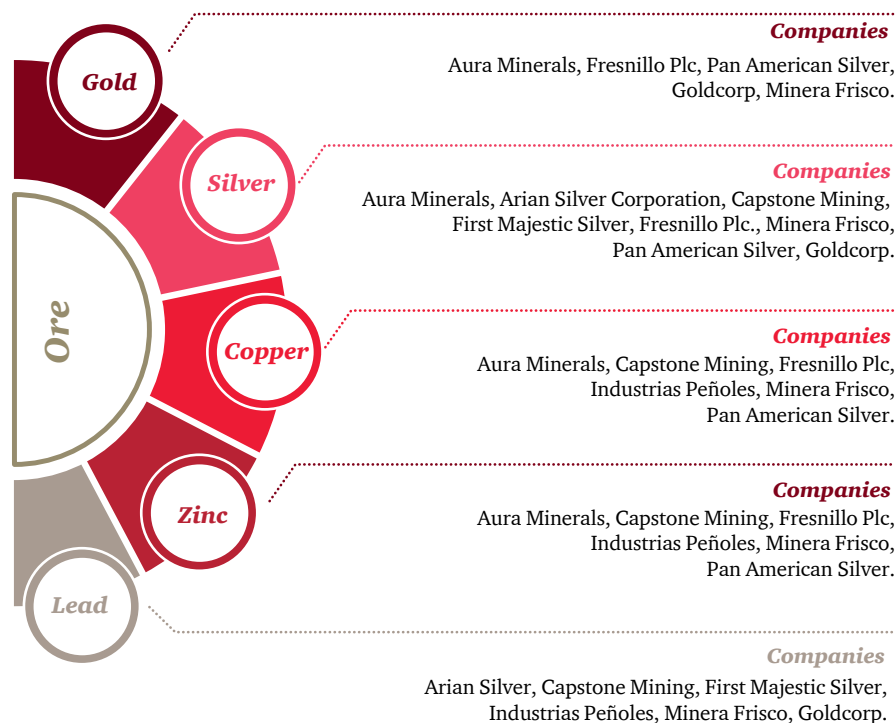
Zacatecas benefits from the presence of Fresnillo Plc which is the top producer of silver and the second producer of gold in Mexico. With 400 years of operation it is the largest underground mine in the world.

Companies like Canada's Goldcorp have successful operations in Zacatecas. Goldcorp operates Peñasquito, which is one of the largest open pit mines in the world.

In addition, Zacatecas has a mining cluster, a platform that provides a favorable business environment to strengthen the mining industry in the state.

Source: Secretary of Economy of the state of Zacatecas.

Graph 49 - Main mining companies in Zacatecas



Source: Mexican Mining Chamber (Camimex), Annual Report, 2015.

In addition, the state has invested in the ore processing plant in the municipality of Vetagrande, which was set up to support small and medium-sized miners who will now be able to exploit ore and deposit it in the plant's yards for subsequent sale. The plant's technology will be used to facilitate the sale of products to mining companies.

State government officials have also been present at major world mining events. For example, in March 2014, the state government (through the Zacatecas Department of the Economy (Sezac for its acronym in Spanish), gave the keynote lecture, "Mining Perspectives, National Governors Conference", in Toronto, Canada, during the PDAC (Prospectors and Developers Association of Canada) World Mining Convention. Such actions reflect the state government's interest in fostering and strengthening the Zacatecas mining industry, both nationally and internationally.

Zacatecas is also home to the first mining cluster of its type in the country, i.e., El Clúster Minero de Zacatecas, A. C. (Clusmin). The cluster is a platform that creates favorable conditions for investments and helps bolster the state's mining industries through five committees:

- The Supplier Development Committee.
- The Human Talent Development Committee.
- The Committee for Security and the Environment.
- The Investment Attraction Committee.
- The Committee for Technological Innovation and Development.

Clusmin's work is subject to triple-helix coordination, i.e., it involves mining companies, educational and research institutions, and municipal, state, and federal governments.

There are currently 45 active suppliers that are members of the organization, in addition to the founding partners, which include:

- Mining companies: Fresnillo Plc, Goldcorp, Minera Frisco, Industrias Peñoles, and Grupo México, among others.
- Supplier companies: Atlas Copco and FLSmidth.
- Academic institutions: Universidad Autónoma de Zacatecas, Instituto Tecnológico de Estudios Superiores de Monterrey campus Zacatecas, and Instituto Politécnico Nacional (IPN).
- Government agencies: The Mining Development Trust, and the State Department of the Economy.

Clusmin was recognized as a success story during the International Mining Convention of Chile, ExpoMin 2014. In the same year, the project "Strengthening of the Competitiveness of Zacatecas Mining Cluster Suppliers" with the National Institute for Entrepreneurs (Inadem, for its acronym in Spanish) was approved and heralded as the second best national project in the cluster category, with an investment of 35.5 million pesos<sup>80</sup>.

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80 Zacatecas Mining Cluster, 2014.

# Analysis of mining sector indicators

## Mining Sector Environment

The mining sector environment indicator reflects the situation of mining in Mexico via five variables that capture the sector's current situation at the regional and state levels. The variables keep track of the number of medium-sized and large companies at the production stage and their contribution to GDP at current prices.

The list includes mining companies (both open-pit and underground). However, due to the importance of underground mining to the Northwest region and the state of Zacatecas, a specific variable is included that identifies the number of underground companies in operation at the end of 2013. Companies that produced more than 500 million pesos in 2013 or 2012 were included, in case of public companies they were included even if their production was below 500 million pesos\*\*.

The indicator includes variables related to investments and/or exploration projects, as mining aims to take maximum advantage of technological developments.

It seeks renewable schemes that will enable it to maintain and increase the sustainability of its operations and consolidate its contribution to Mexico's economic development.

The investment variable refers to investment made by foreign investors in Mexican subsidiaries to maintain or increase investment in property, plant, and equipment as well as development and exploration expenses capitalized in their 2013 financial statements, including similar expenses that form part of business acquisitions. It was found that most financial statements use International Financial Reporting Standards (IFRS) and others use US GAAP. The aim of the study is not to identify these differences in accounting frameworks, but to reasonably distribute between the federative entities or states their investment recorded in books; and thus providing a very good outlook to the reader as to where the mining investments are being made in Mexico\*\*\*.

Lastly, the variable related to exploration projects is included with special emphasis on concessions where it is evident that significant exploration work is being carried out, especially in relation to public companies.

Another observation worth taking into account is that with the exception of the GDP variable at current prices taken from 2013 mining production, the main information considered was related to precious metals and industrial non-ferrous metals because they accounted for around 73% of total 2013 national mining production. At the same time, although oil production is considered part of mining (strictly speaking), oil extraction is performed by other types of companies, and the dynamic is different from open-pit and underground mining. Therefore, information related to oil production was not included in this publication.

Graph 50 - Participation per state of the total number of operating mining companies (precious metal and industrial non-ferrous) at the close of 2013



Source: Camimex information currently being reconciled with the Ministry of the Economy, Operating Mine Outlooks, Infomine and [www.24hgold.com](http://www.24hgold.com)

\* Note: The quantities represented in the variables are in MXN, unless another currency is specified

\*\*Note: Only private mining companies of which there exist information online or of journalistic reference where considered.

\*\*\*Note: This comment is also applicable to the variable Participation by state in income from underground mining production in 2013, public companies 2013 of the Indicator Mining Production.

As of September 2014, there were 84 active mining groups or companies. Sonora and Chihuahua are at the advanced stage and Zacatecas in the middle-to-high stage; however, the Northeast, Center and Center-West regions account for 66% of the total and 56 of them create a corridor that connects regions of high mineral concentration and connectivity with the state of Zacatecas.

There are approximately 292 operating mines. However, only metal and industrial non-ferrous mining companies with a production of more than 500 million pesos (or less in the case of public companies) were included in the study<sup>81</sup>.

**Per state share of the total number of national operating underground mining companies at the close of 2013 (precious metals and industrial non-ferrous metals).**

State	Number of active underground mines at the close of 2013 (precious metals and industrial non-ferrous metals)	National participation percentage for the number of active underground mining companies (precious metals and industrial non-ferrous metals)	Degree of development	Stage
Durango	10	20%	100%	Advanced
Zacatecas	9.5	19%	98%	Advanced
Chihuahua	9.5	19%	98%	Advanced
Guanajuato	3	6%	10%	Medium
Others	19	36%		
<b>Total</b>	<b>51</b>	<b>100%</b>		

Of the 84 mining companies operating in Mexico, 51 operate underground mines, 44 of which are concentrated in the Northeast, West-Central and Central regions, i.e., 86%. These mines are situated in a region that has easy access from Zacatecas.

Underground mines require very specialized machinery and good communication to provide security as well as effectively and sustainably exploit all of the deposits.

Zacatecas, Chihuahua, and Durango form a mining corridor specializing in underground mines with experience and knowledge of the field and ease of communication and transport links with the rest of Mexico.

\* Note:

This variable was prepared with information as of September 2014; fractions are being included originated by those mines that have mixed operations (open pit and underground).

<sup>81</sup> Information obtained from Camimex data in process of reconciliation with the the information of the Ministry of Economy; it includes 224 groups or mining companies, 19 individuals and 22 ejidos, with information as at September 2014.



**Per state share of 2013 total mining production GDP (non-oil) at current prices**

State	GDP from mining production (oil excluded) for 2013 (millions of pesos)	National participation percentage in regards to GDP from mining production (oil excluded) for 2013.	Degree of development	Stage
<b>Sonora</b>	64,749	32%	100%	Advanced
<b>Zacatecas</b>	47,283	23%	91%	Advanced
<b>Chihuahua</b>	17,251	8%	9%	Medium
<b>Coahuila</b>	12,344	6%	6%	Medium
<b>Others</b>	61,792	31%		
<b>Total</b>	<b>203,419</b>	<b>100%</b>		

Source: INEGI Economic Data Bank. Information available in current pesos.

The states of Zacatecas and Sonora together account for 55% of GDP from domestic non-oil mining production with shares of 32% and 23%, respectively.

**Per state share of total foreign public company investment in operation, property, plant, and equipment, and capitalizable development, mining, and exploration expenses in 2013 (precious and non-ferrous industrial metals)**

State	Investment of foreign public companies (production stage) in property, plant and equipment and capitalized development and exploration expenses (thousand US Dollars 2013)	National participation percentage in regards to investment of foreign public companies (production stage) in property, plant and equipment and capitalized development and exploration expenses	Degree of development	Stage
<b>Durango</b>	652,372	28%	100%	Advanced
<b>Sonora</b>	477,874	21%	91%	Advanced
<b>Zacatecas</b>	378,452	17%	53%	Medium high
<b>Chihuahua</b>	206,937	9%	11%	Medium
<b>Guanajuato</b>	190,913	8%	10%	Medium high
<b>Others</b>	384,239	17%		
<b>Total</b>	<b>2,290,787</b>	<b>100%</b>		

Source: 2013 annual financial and operating reports of selected companies.

In 2013, Mexico obtained a total investment for US\$6.5 billion in mining. That same year, foreign investment in the country from active companies amounted to US\$2.2 billion, which was channeled to property, plant, and equipment, as well as mine exploration and development; and similar assets resulting from acquisitions that are capitalized on the general balance sheet. The huge opportunities offered by the Northeast, West-Central, and Northwest regions attract significant investment in plants, equipment, mine development, and exploration. The features of the industry require ongoing modernization, maintenance, and automation of the assets of Mexican subsidiaries and exploration projects.

**Per state share of precious and non-ferrous industrial metal exploration projects as of December 31, 2013**

State	Number of exploration projects for precious and industrial non-ferrous metals	Share of the number of exploration projects for precious and industrial non-ferrous metals	Degree of development	Stage
Zacatecas	149	20%	100%	Advanced
Sonora	139	19%	98%	Advanced
Chihuahua	64	9%	49%	Medium high
Durango	67	9%	48%	Medium high
San Luis Potosí	43	6%	10%	Medium
Others	266	37%		
<b>Total</b>	<b>728</b>	<b>100%</b>		

Source: Mexican Geological Survey and mining outlooks per state. For public companies, we used the financial statements and operating reports published by brokerage firms as of December 31st, 2013.

As of December 31, 2013, the number of precious metal and non-ferrous industrial exploration projects amounted to 728, where 442 (61%) were part of the public sector. There were also 76 projects involving other minerals<sup>82</sup>.\*

Based on information from the Mexican Geological Survey and operating outlooks, there were 1,129 exploration projects, 837 with public companies, and 292 with private companies. In the case of the public companies, a comparison was made with their 2013 financial and operating reports submitted to the Brokerage House, and if no evidence of the exploration projects was found, the project was not specifically named or the exploration was given up, the project was excluded for the purposes of these variable. Those projects amounted to 401.

The number of exploration projects from public companies of the three most representative states are: 109 in Sonora, 55 in Chihuahua, and 34 in Zacatecas.

With respect to the exploration projects of private companies, out of a total of 292, 23% or 68 are only updated as of December 2011; therefore, any update or access to recent operating and financial information may change the number of exploration projects mentioned above.\*

There exist also the possibility that if all (and not just the most important ones) exploration projects were included in the 2013 financial statements or operating reports, another state – mainly Sonora – may have increased the number of exploration projects, with the consequent impact on this variable and the global indicator of the level of progress in Graph 51. In any case, this would not change the focus of the study, which is mostly underground mining (in Sonora, mining is mostly open pit).

\*Information data obtained September 2014.

82 Mexican Geological Survey.

Graph 51 - Global indicator of the level of development per mining sector environment per state.



Source: PwC-Summary of the five Mining Sector Environment Indicator variables.

Zacatecas has the highest level of development with 79.28%, mainly because it has a high level of development in variables concerning the number of actively productive underground mining companies, share of mining GDP, and the number of exploration projects. The Center-West and Northeast mining regions form production chains that can be taken advantage of using available infrastructure and communication links (mainly but not exclusively) for heavy machinery and equipment, and the underground mining supply chain.





## *Mining production*

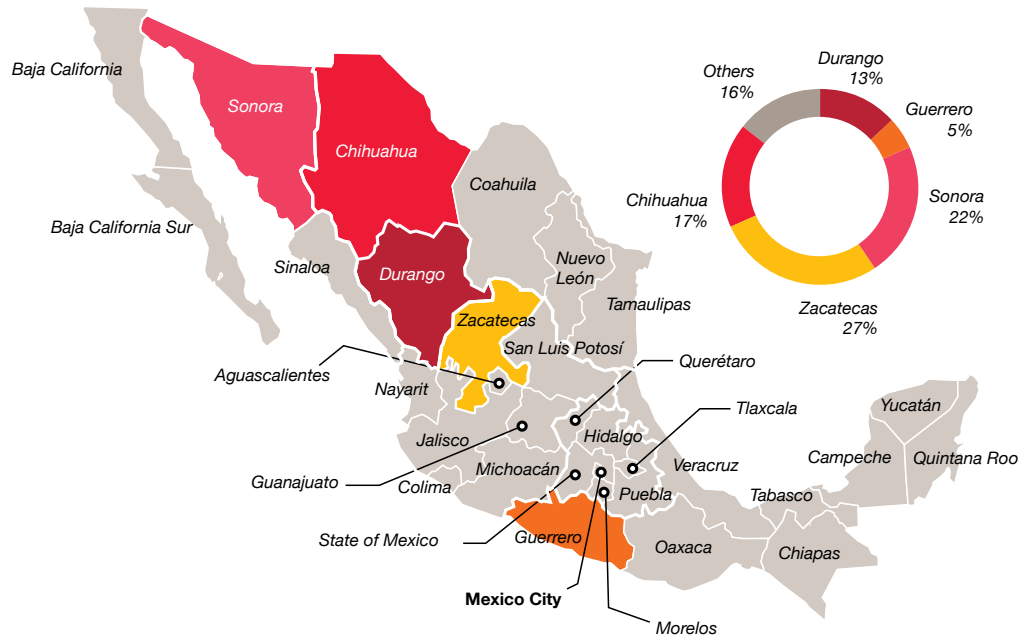
The mining production indicator comprises of the 2013 monetary value in current pesos of the different minerals extracted and the income of underground mining companies for 2013. It helps to determine the areas specializing in each type of metal in order to provide a clear picture of where to articulate production chains and offer different companies an array of investment options.

The indicator comprises of four variables:

1. 2013 precious metal mining production.
2. 2013 industrial non-ferrous metal mining production.
3. 2013 metal and non-metal mining production.
4. Income from public companies underground metal production (precious and industrial non-ferrous metals) in 2013.

This is a compound indicator that uses a variable to evaluate Mexico's overall mining production in relation to underground production, which is where Zacatecas and the West-Central region have the largest presence in terms of production and share.

Graph 52 - Per state share of the value of national precious metal mining production 2013.



Source: Statistical Yearbook of Mexican Mining 2014, Mexican Geological Survey.

In 2013, precious metal mining production amounted to 125 current billion pesos. That year, 27% of precious metals were extracted from the Zacatecas subsoil with a 100% level of development Sonora 94%, and Chihuahua 55% (Graph 52).

Zacatecas plays a key role in the international silver market, as Mexico is the main global silver producer (18% of world mining production in 2014). In relation to this, Zacatecas contributed 41% of Mexico's silver production value in 2014<sup>83</sup>.

83 Source Mexican Mining Chamber (Camimex), Annual Report, 2015.

### **Per state share of the production value of industrial non-ferrous metals in 2013**

State	Mining production industrial non-ferrous metals for 2013 (copper, zinc, lead, molybdenum, bismuth and others), in current pesos	National participation percentage for national mining production of industrial non-ferrous metals	Degree of development	Stage
<b>Sonora</b>	38,222,227,815	57%	100%	Advanced
<b>Zacatecas</b>	12,937,629,815	19%	78%	Advanced
<b>Chihuahua</b>	5,523,619,730	8%	38%	Medium high
<b>San Luis Potosí</b>	3,387,655,905	5%	3%	Medium
<b>Others</b>	6,939,577,779	11%		
<b>Total</b>	<b>67,010,710,400</b>	<b>100%</b>		

Source: Statistical Yearbook of Mexican Mining 2014, Mexican Geological Survey.

Sonora has a large share of the country's non-ferrous industrial metal mining production with 57%, mainly because in 2013 it generated 77% of the value of copper production in Mexico; it is followed by Zacatecas with 19% of domestic production, mainly because in 2013 it was the leading state in terms of the value of lead and zinc production, contributing 51% and 41%, respectively, to the domestic total.

### **Per state share of national metallic and non-metallic mining production in 2013**

State	Mining production metals and non metals, in current pesos	National participation percentage in regards to mining production metals and non metals	Degree of development	Stage
<b>Sonora</b>	66,618,953,015	25%	100%	Advanced
<b>Zacatecas</b>	47,098,802,498	18%	90%	Advanced
<b>Chihuahua</b>	29,763,792,988	11%	48%	Medium high
<b>Durango</b>	22,302,267,166	8%	44%	Medium high
<b>San Luis Potosí</b>	12,622,388,784	5%	6%	Medium
<b>Others</b>	85,281,044,932	33%		
<b>Total</b>	<b>263,687,249,374</b>	<b>100%</b>		

Source: Statistical Yearbook of Mexican Mining 2014, Mexican Geological Survey.

Sonora has the highest level of development; however, the development levels of the main mining states of the Center West and Northwest are outstanding. Furthermore, the sum of the metal and non-metal production of the mining states in those regions along with the center region amounted to 165.4 billion pesos, or 63% of the total. These states are located at an acceptable distance from Zacatecas.

**Per state share of overall income from operating underground mines in 2013. Industrial non-ferrous and precious metal public companies.**

State	Revenue active underground mines from 2013, public companies, precious metals and industrial non-ferrous metals. (thousands of US Dollars)	National participation percentage in regards to revenue from active underground mines for 2013, public companies, precious metals and industrial non-ferrous metals.	Degree of development	Stage
<b>Zacatecas</b>	1,602,913	31%	100%	Advanced
<b>Chihuahua</b>	1,039,937	20%	88%	Advanced
<b>Durango</b>	757,780	15%	82%	Advanced
<b>State of Mexico</b>	369,163	7%	41%	Medium high
<b>Sonora</b>	370,922	7%	41%	Medium high
<b>Others</b>	1,050,778	20%		
<b>Total</b>	<b>5,191,493</b>	<b>100%</b>		

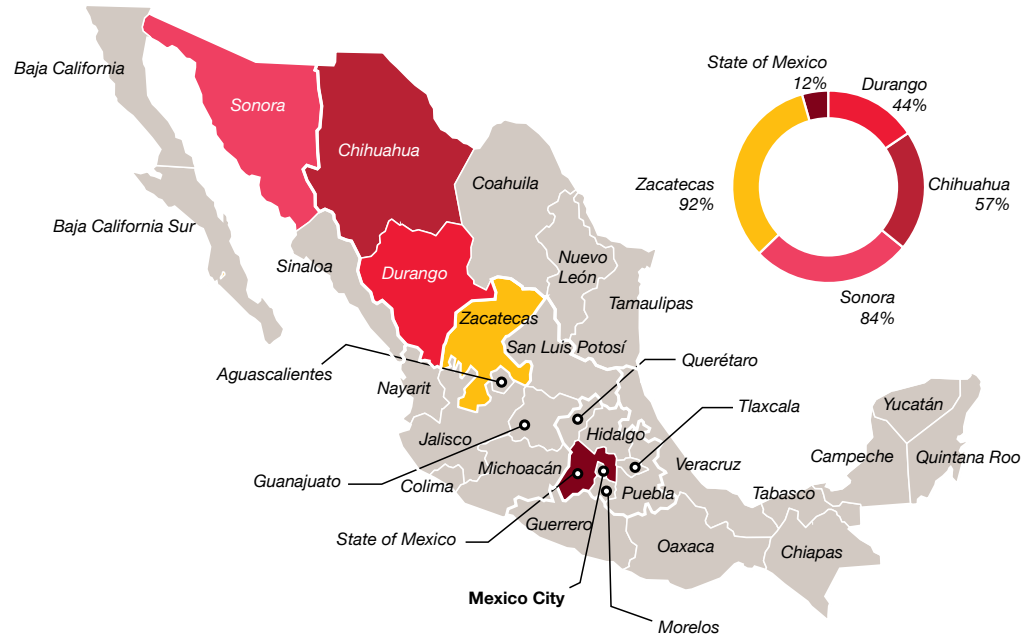
Source: Consolidated financial statements as of December 31st, 2013, and the operating reports of selected companies.

According to the financial statements of each company, income from this variable totaled US\$5.2 billion. In some cases, however, the source did not state a specific amount for each of the companies' mines. Their ore volume as a percentage of total income was used instead to determine the revenue pro rata or distribution revenue. The rationality of variations in inventories at the close of 2012 and 2013, and 2012 metal production trends were also taken into account.

Although Sonora produces a large volume of industrial non-ferrous metals, Zacatecas' large number of underground mines, including the presence of Fresnillo Plc (the world's largest silver producer), benefits this state. The result is that Zacatecas accounts for 31% of underground mining income, followed by Chihuahua and Durango.



Graph 53 - Global indicator of the level of development of mining production value by state.



Source: PwC-Summary of the four Mining Production Indicator variables.

Zacatecas has the largest precious metal mining production, and Sonora, the largest non-ferrous metal production. Sonora generates a higher value of production; however, the table of underground mine revenues shows that Zacatecas exceeds the revenues of other states, mainly because it concentrates 19% of mining companies with underground mine operations. We reiterate that with respect to the underground mining supply, the mining states of the Center-West, Northeast, and Center have the potential to create strong synergies through the appropriate use of infrastructure, communication networks, human resources, etc.

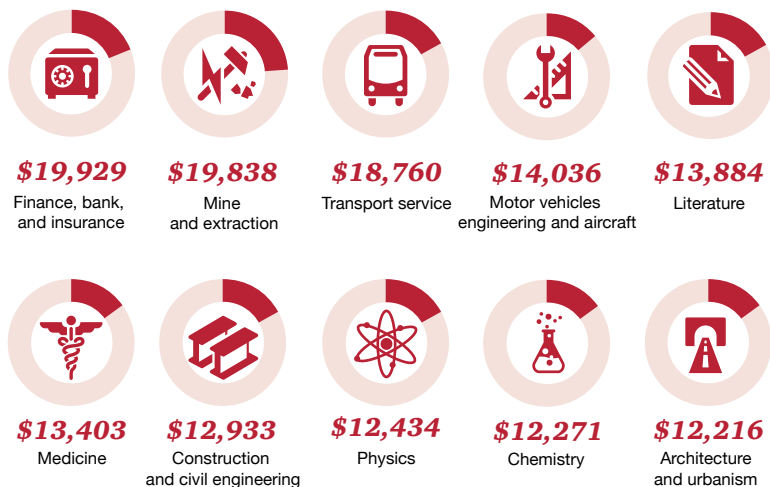




## Employment generation and participation

The employment generation and participation indicators show how important the mining sector is to the Mexican economy, as alongside agriculture, it is the industry with the biggest impact on communities and local governments. It should be noted that in 2014, the mining sector was among the highest paid careers in Mexico, as shown below:

Mexico's best-paid types of work - Average monthly wage in pesos- Fourth quarter of 2014



Source: Mexican Competitivity Institute, imco.org.mx/

As the usefulness of this indicator lies in highlighting progress with employment and the mining sector economically occupied population, the variables included were:

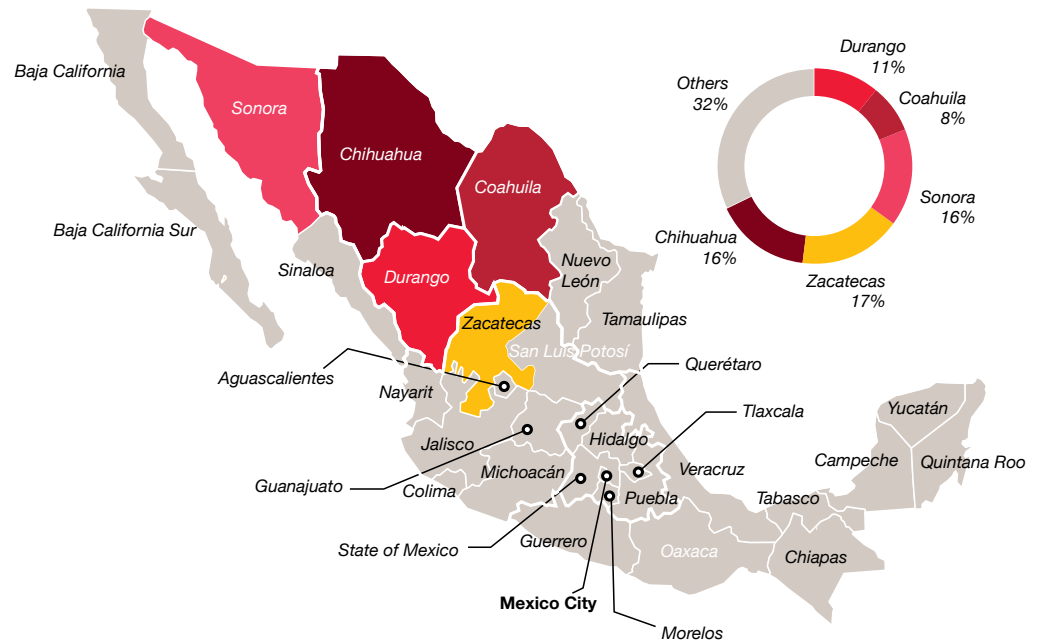
- The number of employees hired in the mining sector of the mining-metallurgic industry.
- The percentage of the economically active population occupied in the mining sector of the mining-metallurgic industry.

This indicator demonstrates the capacity of the mining sector to generate jobs.

In order to strengthen the relevance of employment to those states, not only did we analyze the number of jobs but we also measured, the percentage of the economically active population occupied in this sector using aggregate data.

As of December 2014, there were 68,377 employees hired in the mining sector of the mining-metallurgic industry.

Graph 54 - Per state share of the number of employees working in the mining sector of the mining-metallurgic industry 2014.



Source: Ministry of the Economy, Mining Handbook, March 2013.

At the end of 2014 with respect to this variable at the state level, Zacatecas had 11,320 employees, Sonora 11,006, and Chihuahua 10,622. The level of development with the number of employees concentrated in the mining sector is Zacatecas 100%, Sonora 99% and Chihuahua 98%, all at an advanced stage<sup>84</sup>.

<sup>84</sup> As of March 2014, there were 69,536 people working in the precious and industrial non-ferrous metal mining sector, according to Ministry of the Economy data in Mining Handbook 2014 a Compendium of the Mining Industry, 2015.

The number of employees per company and wage allocation is an ongoing task that depends on external and internal business conditions, company resources, characteristics of the reserves, etc.

Likewise, the profitability of mining is usually more inclined towards the quality of the reserves in terms of amount and ore. There are, however, other factors; i.e., investing in and retaining talent also requires investment in recruitment, ongoing training, and competitive wages that enable people to develop in order to meet the high and complex global demands of this industry; as well, increase operating efficiency while at the same time mitigating the sector-inherent significant risks that commonly arise.

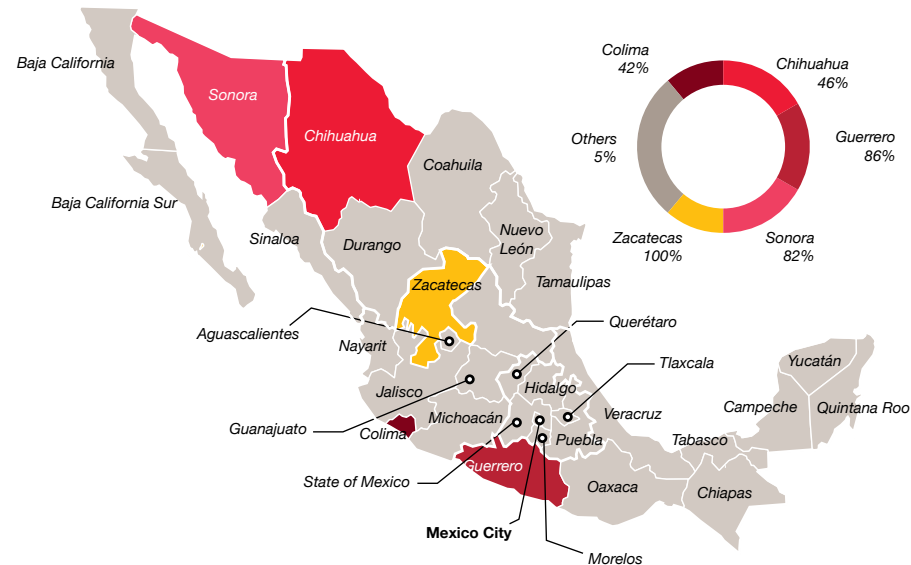
Thus, based on statistics provided by the Mexico Social Security Institute (IMSS, for its acronym in Spanish) as of June 2015, the highest integrated daily wages of mining industry employees for some states were the following: Guerrero, 540 pesos; Chihuahua, 582 pesos; Zacatecas, 556 pesos; and Sonora, 530 pesos; the latter three with very high rankings in the mining production indicator. It should be noted that the average integrated daily wage as of that date for the non-oil mining industry was approximately 405 pesos; whereas the national average is 295 pesos.

Salaries received by the mining industry employees are considerable higher than the national average, thus somehow reflected in the mining production Indicator, stimulating employment generation.

High wages strengthen the personnel recruitment and retention process, contribute to reconciliation during labor disputes, to sustained operations and to the trust of different industry participants. These include mining company suppliers, for which highly trained personnel is an investment incentive.

Although the Mexican Mining Chamber (Camimex) annual report of 2015 considers the human resources area as a challenge due to lack of professionals, it is evident that the mining companies are investing in their people.

Graph 55 - Level of development of the percentage of the economically occupied population employed in the mining sector of the mining-metallurgic industry 2014.



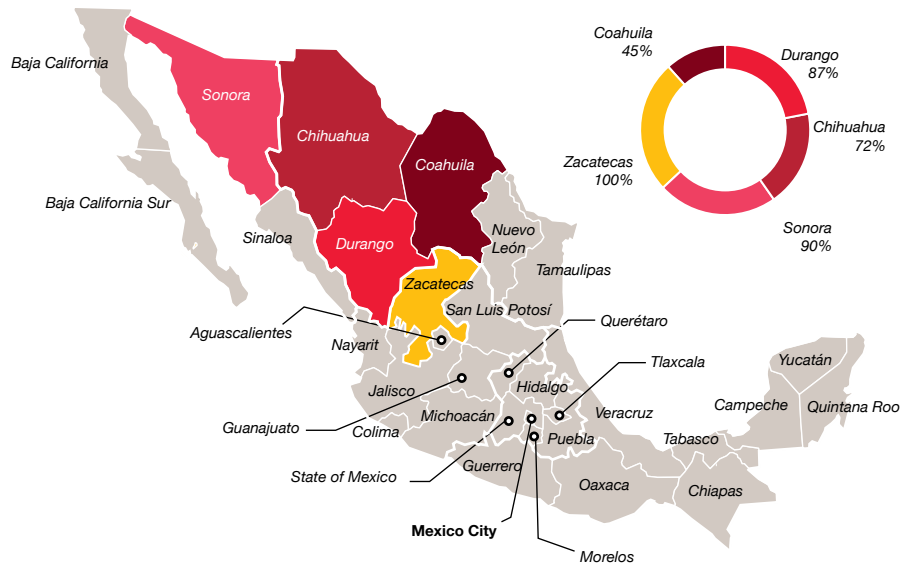
Source: INEGI, Prontuario Minería, July 2015.

Note: Economically active population in the mining sector of the mining-metallurgic industry as a percentage of the total economically active population. The economically active population data relates to the, quarterly average 2014 INEGI and National Mining Coordination, Head Office of Mining Development.

As of December 2014 and based on the economically occupied mining population participation variable, when dividing the number of metal industry employees in the mining-metallurgic industry by the average economically occupied population of the state, we find that 1.9% (or almost 2 out of every 100 workers) of the Zacatecas economically occupied population is employed in the mining sector, in metal mining, in Durango 1.1% and Sonora .86%. They are the only states at the advanced stage in this variable denoting the boom and culture of the mining industry there, where large sectors of the population work in mining providing an additional reason (not just a federal or state one) for the industry to receive incentives for generating and increasing investment, as well, protecting and creating jobs.

The participation variable in Graph 55, comprises two factors for obtaining the values for determining the level of development. As a result, the chart shows degrees of development instead of state share (unlike the other variables where the sum of all of the states and/or regions produces 100% of the variable in question). This situation arises from the need to include statistics that complement job creation based on what they in turn represent to the generation of solid mining cultures that in our view permit a more complete appraisal of what employment and investment in the sector mean for the mining industry.

Graph 56 - Global indicator of the level of development by employment generation and participation by state.



Source: PwC. Summary of the three variables of the Employment, Profitability and Participation Indicator.

Zacatecas and Sonora obtain the highest levels of progress in this variable relative to employment and the generation of mining communities and/or cultures.

## What does the future hold?

The year 2014 was one of the worst years for mining industry profitability globally, with average metal prices trailing 2013 levels and little prospect of any meaningful increase. In spite of this, Mexico managed to remain competitive in mining, attracting investment and generating new projects.

In order to diminish the effects of this crisis, a strong focus on profitability is expected, based on cost reduction and higher productivity. However, care must be taken not to increase operating risk in the process, as this could lead to inadequate use of equipment and increase accidents, which can be mitigated with proper cost reduction programs, asset management, the use of technology and sustainability programs, among others. Areas of opportunity should be addressed and companies should work alongside the authorities and communities to establish agreements with the parties involved with a view to generating wealth and well-being for all.

While it is difficult to predict the course of medium and long-term events (with certain variables that impact metal prices moving in the opposite direction and international conflicts entering the metal price variation factor scene), the reality is that Mexico has much to offer to the mining world.

Through proper management of resources, through communication, empathy and flexibility among interested parties, and by taking environmental and global trends into account, Mexico can remain profitable and competitive and mining can become a pillar of the economy, aligned with the development and economic growth objectives of the Pact for Mexico reforms, resulting in all-round growth.



## Conclusion

Zacatecas offers incentives for investment, including adequate infrastructure and a stable workforce. The state has also made solid development in legal security and the quality of life in a low-cost region. Furthermore, it provides easy access to domestic and international markets and offers a favorable business environment, backed by the Investment and Employment Act along with the state government's commitment to maintain an appropriate business climate.

In the results of our integral analysis and conclusion on the three indicators, Zacatecas has obtained a higher degree of development, much like other federal entities with mainly underground operations who have also achieved solid degrees of development; thus opening up an important market for the production and sale of heavy machinery and equipment, and mining suppliers.

Structural reforms are expected to bring more investment into Mexico especially in the telecommunications and energy sectors. These reforms are expected to drive economic growth over the medium term, and improve manufacturing productivity. In fact, the telecommunications reform has already generated an investment of more than US\$6 billion and the average annual growth of GDP in the telecommunication sector in 2013-2014 was double than the average annual growth of national GDP<sup>85</sup>. In addition, the energy reform has been estimated to generate investments in gas pipelines, exploration, oil fields, and electricity generation. Furthermore, generation of new direct and indirect jobs is expected<sup>86</sup>.

Within the agreements of President Enrique Peña Nieto, the National Development Plan 2013-2018 includes more than 150 commitments related to infrastructure, 95 of which involve transportation infrastructure. The 2014-2018 National Infrastructure Program announced in April 2014 contemplates an overall investment of 7.7 billion pesos (approximately US\$500 million) generating 743 projects and an additional 350,000 formal jobs per year<sup>87</sup>.

In this context, we find that Zacatecas has the potential and the foundations to be a platform for internationally recognized suppliers of heavy machinery built (albeit not exclusively) for underground mining. This will give mining industry suppliers an increasing incentive to do business; and thus enabling Zacatecas to become the distribution hub both for Mexico and the world.

<sup>85</sup> Department of Communications and Transport, Report of the advances of the Telecommunications Reform, March 2015.

<sup>86</sup> Embassy of Mexico in France, 2015.

<sup>87</sup> Office of the President, Government of Mexico, 2014.

Note: The information contained in this study is for consultation and analysis purposes only; therefore, PwC México cannot be held responsible for any decisions based on it.

# Methodology notes

## Composition of each indicator

**Indicator:** mining sector environment.

**Definition:** relevant data on the number of mining companies in the country, types, mining industry share of GDP, foreign investment, and exploration projects.

**Variables include:**

- Number of operating mining companies (precious and industrial non-ferrous metals) at the end of 2013.
- Number of companies with operating underground mines at the end of 2013 (precious and industrial non-ferrous metals).
- Mining production GDP at current prices (non-oil) in 2013.
- Investment of foreign public companies (production stage) in property, plant, and equipment, and capitalizable development expenses per mine and exploration in 2013.
- Exploration projects for precious and industrial non-ferrous metals at the first quarter of 2014.

**Indicator:** mining production.

**Definition:** the production of different ores in Mexico and revenue from this production.

**Variables:**

1. Precious metal mining production, 2013.
2. Industrial non-ferrous metal mining production, 2013.
3. Metallic and non-metallic mining production, 2013.
4. Income from underground mines of public companies engaged in metal production (precious and industrial non-ferrous metals) in 2013.

**Indicator:** employment generation and participation.

**Definition:** number of mining sector employees and the economically active population's share of the industry.

**Variables:**

- Number of employees engaged in the mining sector (metals-mining-metallurgic industry).
- The percentage of the economically active population occupied in the mining sector (metals-mining-metallurgic industry).

**Indicator:** macroeconomic environment.

**Definition:** Total GDP, per capita GDP, exports, income, administration, public spending and debt.

**Variables include:**

- Total GDP.
- Per capita GDP.
- Exports.
- Number of established companies, by sector.
- Financial obligations as a percentage of GDP.
- Own income, taxes, and, government fees.
- Current expense, ordinary tax resources, federal taxes, agreed federal reassignments, and public debt.
- Investment and/or capital investment.
- State productivity index.



**Indicator:** transparency.

**Definition:** access to public information concerning the origin and application of public spending; as well, the implementation of laws that harmonize financial information and transparency systems in federal states and municipalities.

**Variables include:**

- The government transparency index.
- The electronic governance index.
- The degree of application of the General Accounting Law.

**Indicator:** business climate.

**Definition:** conditions that facilitate business activities, trade and the incorporation of companies, simplify formalities, and encourage the proper working of strategic sectors.

**Variables include:**

- Cluster.
- Industrial parks.
- Population distribution.
- Development bank loans.
- Communication access (air, ports, rail, and land).
- Number of environmental impact assessment programs.
- Tax incentives.

**Indicator:** infrastructure.

**Definition:** federal investment by state and municipality in economic and social infrastructure. Infrastructure development through public works and/or public-private Association (APP, for its acronym in Spanish).

**Variables include:**

- Maintenance and modernization of the transportation, road, and highway network.
- Connectivity with ports and (in the future) with internal customs ports.
- Public hospitals (for every 100,000 inhabitants).
- Private hospitals (for every 100,000 inhabitants).

**Indicator:** tourism.

**Definition:** economic activity in the state reflected in greater investment and service availability.

**Variables include:**

- Archeological sites.
- “Magical towns”.
- Number of hotels by federal state for every 100,000 tourists.
- Number of rooms available per state.
- Tourist flows.
- Restaurants.

**Indicator:** urban development.

**Definition:** recovery of public spaces, reactivation of areas not currently in use, protection and conservation of urban landscapes and the promotion of sustainable housing construction in search of competitive development of the city and the fostering of projects that have a positive impact on the inhabitants of each state.

**Variables include:**

- Drinking water plants.
- Cultural centers for every 100,000 inhabitants.
- Number of public transport vehicles for every 100,000 inhabitants.
- Leisure facilities for every 100,000 inhabitants .
- Museums for every 100,000 inhabitants.
- Theaters (for every 100,000 inhabitants).
- Golf courses.

**Indicator:** education.

**Definition:** organized and sustained information transfer designed to result in learning.

**Variables include:**

- Number of public and private universities/polytechnics for every 100,000 inhabitants.
- Number of research centers.
- Number of researchers per scientific area.
- Specialized graduates.
- Percentage of the population with higher education.

**Indicator:** health.

**Definition:** access to health care and ratio of health centers to the number of inhabitants per state.

**Variables include:**

- Eligible population (Popular Insurance) (level of coverage per state).
- General hospitals with specialists.
- Specialist physicians for every 100,000 inhabitants.
- General physicians for every 100,000 inhabitants.

**Indicator:** access to technology.

**Definition:** level of access and use of technology by inhabitants for education and daily living.

**Variables include:**

- Internet availability and internet in basic education (primary and secondary schools).

## Indicator and variable measurement system

### 1 Stage Range – Identifying states in the respective stages

Using minimums and maximums for each variable, we found ranges for each of the stages. The calculation would be:

$$\frac{\text{Maximum Value} - \text{Minimum Value}}{4} = R_e$$

Where  $R_e$  represents the value of the stage range.

If a maximum value is 50% higher than the closest value, it is viewed as a special case. To find the difference between the values we used:

$$\left( \frac{\text{Maximum Value}}{\text{Minimum Value}} - 1 \right) \times 100 = D$$

Where D represents the difference (%) between values.

If the result is positive, the ranges are re-calculated because the high value of the maximum would not show the true performance of the AM/States in the indicator. For this, the same formula is used, only using the closest value as the new maximum value:

$$\frac{\text{Maximum Value} - \text{Minimum Value}}{3} = R_e$$

### 2 Range of development – Identifying states' strengths and areas of opportunity

We calculated levels of development with respect to the best national performance. To do this, the corresponding maximum must be determined and a numerical value that offsets being at one stage or another must be added.

The formula for calculating the level of global development with respect to the best national performance is the following:

$$\left[ \left( \frac{\text{AM/State Value}}{\text{Maximum Value of the Stage}} + \text{Compensatory value} \right) / 4 \right] \times 100 = \text{GA}$$

Where GA represents the level of development.

GAs provide knowledge of strengths and areas of opportunity for each variable.

### 3 Stage Range – Identifying States in their respective stages

Once the levels of development for each variable are known, a Global Indicator Value (GIV) can be calculated, as follows:

$$\frac{\sum \left[ \left( \frac{\text{AM/State Value}}{\text{Maximum Value of the Stage}} + \text{Compensatory Value} \right) / 4 \right] \times 100}{\text{Number of variables}} = \text{VGI}$$

In this way, a global percentage is assigned to each AM/State in each of the 10 indicators.

The Global Indicator Value (GIV) is divided by the following percentages:

- Medium Stage: 0% - 33%
- Medium-to-High Stage: 33% - 66%
- Advanced Stage: 66% - 100%

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# *Interviews*





## **Carlos Caicedo** **Atlas Copco**

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- Mechanical Engineer with a degree from Universidad de los Andes; took part in international programs at universities in Colombia, USA, and Sweden.
- Joined Atlas Copco in 2004 to develop the markets in Colombia, Perú, Ecuador, Venezuela, and Guyana. Promoted to General Manager of Atlas Copco Colombia in 2007; and then to General Director of Atlas Copco Mexico, and General Manager of Rock Mining and Excavation area in 2011.

### ***Explain the growth of your company and the advantages of being located in Zacatecas.***

It was an excellent strategic decision to establish our mining operations in Zacatecas more than fourteen years ago. This is greatly due to one of our corporate values to interact with our clients and operate as close as possible to them with the aim of providing them with better support.

Since our establishment in Zacatecas, our organization has grown considerably in infrastructure – development of a service center of reconstruction and warehouse – and also in qualified personnel. During this time, in collaboration with our clients, state government and Mining Cluster, we have developed a competent and committed entity.

### ***Has the Mexico-Zacatecas industrial and logistics infrastructure benefited you?***

I believe that the infrastructure is well prepared and organized. Generally speaking, transportation is no longer a problem for our market, although naturally, certain things could improve. International trade is very easy, as very good infrastructure facilitates getting goods to the ports.

### ***What is your opinion of local talent in Mexico and Zacatecas?***

Generally good. You have people who are prepared, but I think that particularly in the mining industry, growth has been so fast that it is sometimes difficult to find people with the proper know-how. So we decided to work with certain schools so that the technicians can be trained as per our requirements to ensure that they are able to understand more of our requirements right away.

### ***What is your perception of market development in the mining sector? What are its strengths and weaknesses?***

We handle four different business areas; rock mining and excavation is just one of them. In the case of Mexico, that is the major business. The mining industry in Mexico and in the rest of the world is currently dealing with low ore prices, and is having particular difficulty with a new tax. The country is full of minerals. The industry is very well developed and the challenge is to increase efficiency day by day in order to find the best way of obtaining those minerals without affecting the environment and the population.

### ***What advice would you give to companies interested in investing in Mexico?***

I think Mexico is a marvelous country with many favorable conditions and many great people with a desire to work. There are many opportunities to take advantage of.

### ***Why invest in Zacatecas?***

Zacatecas is a state of opportunities due to the development of the area and its capacity to support the private companies in their activities. In addition, there is an opportunity to count on trained personnel, considering that the population is young and there is a great quantity of education available. Furthermore, there are business opportunities and it is a pleasant place to establish thanks to nature and cordiality of its people.



## **Pablo Yaco Reimers Campos** **Cesantoni**

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- Business Administration Degree from ITESM, Campus Monterrey. Postgraduate courses in Business Management at EGADE and IE Business School.
- General Director of Cesantoni and Vice President of the Board at ITESM, Zacatecas campus. Also, a member of the Economic Development Committee of the government of the state of Zacatecas, and of the National Finance Board.

### **Explain the growth of your company and the advantages of being located in Zacatecas.**

Zacatecas has natural gas since six months ago, which is extremely important for the state because it puts us on the same footing as the rest of the country as it concerns attracting new investment. It has resulted in significant savings for Cesantoni, which has made it possible to invest in a new plant that will allow us to boost profitability. This was also possible because Zacatecas has optimum non-metallic minerals required by the ceramics industry, a privileged geographical position (we have more than 50% of the Gross Domestic Product within a 500 km radius), very good available labor, and a government fully aware of the needs of businessmen.

### **Has the Mexico-Zacatecas industrial and logistics infrastructure benefited you?**

Aside from having all services at our fingertips, a good labor climate and the Centennial Gas Pipeline, the road network has definitely evolved a great deal in the last few years. The next step should be a dry port to help to reduce inequality in economic and industrial development.

### **What is your opinion of local talent in Mexico and Zacatecas?**

Considering the economic environment in Mexico, Zacatecas has all that it takes to succeed, and its people will be the key.

They are hard-working and talented; but the state has limited labor opportunities because jobs are not created often, which has resulted in talent leaving for nearby states or for the US. It should also be remembered that Mexico is still undergoing serious structural challenges, such as the informal economy and poor social protection.

The work environment is changing and companies are searching for ever more specialized profiles, which means that relations between companies and the education system must be strengthened in order to improve the level of teaching and generate quality standards. The government is fully aware of the fact that the most effective way of boosting economic development and benefits for families is through job creation.

### **What is your perception of market development in the mining sector? What are its strengths and weaknesses?**

Zacatecas has significant potential for the extraction of non-metallic minerals, which poses a new opportunity for industry. One of the advantages is that it does not require as much investment for extraction and processing.

### **What advice would you give to companies interested in investing in Mexico?**

Mexico consists of 32 state entities which unfortunately do not all share the same conditions regarding governance, security and development. Structural reforms will take time to mature and begin to show results.

### **Why invest in Zacatecas?**

Natural gas is basic in any modern economy as it has rapidly become the vital driver of worldwide industrial development. Investments such as those made by the state in natural gas will place Zacatecas in an advantageous position worldwide to receive all types of investment projects.



## **Richardt Fangel** **FLSmidth**

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- Bachelor's degrees in Economics and Strategic Planning. MBA from Pacific Western University.
- General Director of FLSmidth Mexico; a former President of the Board of Directors of the Nordic Chamber of Commerce for Mexico; and a member of council of the Zacatecas Mining Cluster.

### ***Explain the growth of your company and the advantages of being located in Zacatecas.***

Up until 2008, the Mexican mining market was handled from USA and Chile. Our business model changed in 2008 and the Mexican mining market is now handled through our local presence. Our presence in Zacatecas is a natural consequence of that change. We offer full post-sale services in Mexico; and Zacatecas offers the conditions for doing so. Within a radius of 500 km, we cover almost 70% of the value of Mexican mining production. Most of our team is located within that zone, which allows us to provide more efficient services with spare parts stock programs, specialized service, and maintenance. That has allowed us to achieve double-digit growth in post-sale services over the last few years.

### ***Has the Mexico-Zacatecas industrial and logistics infrastructure benefited you?***

I have been here for 25 years and have been a witness to this development. Taking infrastructure as a whole, over the last six years, there has been record construction of quality roads connecting Zacatecas to the rest of the country. However, it is a shame that nothing has been done as far as railroads are concerned. We are now hearing news of improvements in freight transportation. There is still a lot to be done.

### ***What is your opinion of local talent in Mexico and Zacatecas?***

It is true that there is a lot of young talent, but at a certain point as in the 1990s, there were no jobs available; and that talent left the country. If focus is placed on developing talent, particularly specialized talent, it must be ensured that the respective jobs are there. In the automotive industry, six billion dollars are being invested in new plants, which would not occur if there were no skilled workers.

### ***What is your perception of market development in the mining sector? What are its strengths and weaknesses?***

The mining industry was opened up to foreign companies again in 1993. Prior to that, all mining exploration was reserved for Mexican investment. There are currently around 800 exploration projects in Mexico, 600 of which are conducted by Canadian companies. In 2012, there were investments of up to seven billion dollars. We saw a decrease in 2014, not because mining in Mexico is no longer attractive, but due to growth in China and India. However, while those countries continue to grow, Mexico will still have a brilliant future in mining. At the same time, two matters must be kept in mind: first of all, water supply (mining processes demand large volumes of water); and the impact of new taxes (which could make Mexico less competitive than other mining countries).

### ***What advice would you give to companies interested in investing in Mexico?***

They should keep in mind the large number of trade agreements signed by Mexico, such as NAFTA with a market of 300 million people in North America, and trade ties with Latin America. They should also consider low manufacturing costs.

### ***Why invest in Zacatecas?***

The benefit for our clients is that they can be sure of high availability for production with our equipment installed in the region. With inventory investment programs, training offered to clients and availability of technicians specializing in our equipment, we ensure better service for our local clients in the regional center.



## **Eduardo López Muñoz**

### **Grupo Iso**

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- Degree in Business Administration from Universidad Autónoma de Guadalajara. Two post-graduate courses in Senior Management: one from IPADE and the other from ITESM.
- Chairman of the Board and CEO of Grupo Iso; and Vice President of the Consulting Board at Banco Nacional de México (Banamex) for Aguascalientes, San Luis Potosí, and Zacatecas regions. Advisor to a number of public, private, and academic entities.

#### ***Explain the growth of your company and the advantages of being located in Zacatecas.***

Grupo Iso is 100% Zacatecan. It was founded by my father 57 years ago. It began as a company in the gasoline sector and slowly spanned into other sectors, such as agro-industry, automotive manufacturing, hotels, hydrocarbons, wines, and construction. The group has experienced uninterrupted growth, which has been made possible thanks to the opportunities for diversification in the state and investment conditions for generating business.

#### ***Has the Mexico-Zacatecas industrial and logistics infrastructure benefited you?***

Industrial infrastructure in the state, such as the gas pipeline, has had a strong impact on Grupo Iso's business, mainly in the hydrocarbon sector. In my opinion, road infrastructure arrived somewhat late for the development of state logistics and for the companies in the area. This has resulted in an economic lag, which can be seen in the entity's economic indicators.

#### ***What is your opinion of local talent in Mexico and Zacatecas?***

Mexicans in general have the necessary attitude to perform in companies of all sizes, but I believe the education system falls short of providing what companies are actually in search of. One example is the level of English teaching. In other states, most individuals are bilingual, while in Zacatecas it is not easy to find adequate talent with the proper training for the business world.

#### ***What is your perception of market development in the mining sector? What are its strengths and weaknesses?***

It is a very important sector, which has supported the development of Zacatecas for many years. Nevertheless, it will be affected by the recent tax reform, although the rise in prices will offset the tax situation. However, in spite of its ups and downs, the sector should continue to grow in the coming years.

#### ***What advice would you give to companies interested in investing in Mexico?***

Mexico offers many benefits and advantages to investors. However, it is important to observe how the government changes the rules of the game, as this can generate instability in the business environment and uncertainty for investors. If all this can be stabilized by the government, Mexico has the capability to attract investments that will lead to the growth of entrepreneurial groups and result in social well-being.

#### ***Why invest in Zacatecas?***

Mainly because of the outstanding geographical location; i.e., 60% of the important destinations in the country are less than five hours away; new industrial parks and important investments in road and natural gas infrastructure are under way; and assistance is being provided to companies to bring in new technologies that will reduce operating costs – thus promoting business development and generating new jobs in the state.



## **Juan Enríquez Rivera** **Grupo Plata Zacatecas**

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- Accounting degree from Universidad Autónoma de Zacatecas. Headed the Zacatecas Department of Industry, Tourism, and Mines from 1986-1990. Acted as representative of employer associations at the state and municipal level.
- President of CANACO Zacatecas from 1978-1979 and national advisor to the CONCANACO. Also, State President of COPARMEX (2000-2001). Acted as an advisor to financial entities.

### ***Explain the growth of your company and the advantages of being located in Zacatecas.***

Given the nature of the company (service), its growth has gone hand-in-hand with development of the state. The creation of new businesses or services generates business opportunities.

### ***Has the Mexico-Zacatecas industrial and logistics infrastructure benefited you?***

Zacatecas lacks infrastructure and overland and air communications when compared to conditions across the country. Zacatecas needs more extensive infrastructure, because there are currently very few benefits.

### ***What is your opinion of local talent in Mexico and Zacatecas?***

There is a great deal of talent throughout the country, but I believe it is not fully utilized. There is talent in Zacatecas, but people move elsewhere due to the lack of opportunities and well-paid jobs related to their capabilities, competence, and training.

### ***What is your perception of market development in the mining sector? What are its strengths and weaknesses?***

The mining market is based on the worldwide value of metals. When ore prices in our country are good, acceptable dividends are paid and development is achieved. Exploration and exploitation of deposits is the result of market value.

The strengths of the Zacatecas mining sector can be seen in the experience of its talent, the richness of the subsoil, its strategic location in the central northern part of the country, the existing mining infrastructure, and the mining vocation of its people.

Its weaknesses include its dependence on the value of metals on the international market; the lack of modern road infrastructure; poor railroad networks offering rapid connections to ports in the Pacific and in the Gulf of Mexico.

### ***What advice would you give to companies interested in investing in Mexico?***

Mexico is a country of opportunities. Despite its fluctuations, it offers hard-working people with acceptable levels of technical and professional training.

Its benefits should definitely be exploited. One of them is the fact that it borders the largest market in the world, USA.

### ***Why invest in Zacatecas?***

Companies should invest in Zacatecas because of its excellent geographical position, and the reliability of its trained and efficient human resources. Additionally, there is a good standard of living for middle-class workers, whereas in other cities in Mexico they require a higher level of income.



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# Appendix



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# *Regulatory framework*

## *How is mining regulated in Mexico?*

It is very important for investors to have certain knowledge about the legal and regulatory framework of the mining industry, as it increases legal certainty of the conditions offered by the Mexican government. That framework can be summarized below.

The Mexican tax system is part of the Mexican Constitution. Article 31, section IV provides the Federation, States and Municipalities with the legal basis for determining taxes, Social Security dues, public works taxes, and government fees; and reads as follows:

“It is the obligation of Mexicans to contribute to public expenditure of the Federation, the Federal District, the state or the municipality in which they reside, proportionately and equitably, as provided for by law”.

Thus, at the federal, state, and municipal levels of government, Mexico has established a series of taxes, Social Security dues, public works taxes and government fees that can be applied to all types of companies engaged in different sectors of the economy; including those engaged in the mining industry, based on the special characteristics of each in more detail in following paragraphs:

- a)** The Mining Law.
- b)** The Income Tax Law.
- c)** The Special Mining Tax.
- d)** The Value Added Tax Law (VAT).
- e)** The Social Security Law.
- f)** The National Water Law.
- g)** The Federal Environmental Responsibility Law.
- h)** The Public Mining Services Manual.

The Department of the Economy, through the General Mining Coordination and the General Department of Mining, regulates mining concession requests and keeps a record of companies with direct investment.

Interest in mining development is reflected in all the activities related to regulation, coordination of mining policy; exploration and exploitation; as well, state financing for small and medium-sized investment.

## Appendix I

Refers to the location of precious and base (industrial non-ferrous) metal mining companies at the end of 2013 and lists mining companies with more than 500 million pesos in production (in the case of public operating companies, with production below the aforementioned were also included), prepared with information available as of September 2014.

## Appendix II

Location of operating mining companies at the end of 2013 (small and medium-sized with production of less than 500 million pesos for the purpose of this study), prepared with information available as of September 2014.

Note: For appendices I and II, see supplementary maps.

## Appendix III Executive summary of the legal and tax environment of the mining industry

### Organizations and institutions that regulate the mining sector through the Ministry of the Economy

The Ministry of the Economy, through the Ministry's General Mining Coordination and the General Department for Mining, regulates mining concession requests, the promotion of mining activity and the registration of companies with direct investment. It also provides geological mining services.

Graph 57 - Organic regulatory structure.





### *The Mining Law*

In recent years, the legislative, economic, and social analysis of mining in Mexico has been the subject of increasingly heated debates. The study of profits generated by the sector, tax treatment, how concessions are granted and miners' Social Security are some of the mining related topics of national interest that are repeatedly addressed by the Congress.

Mining activity in Mexico is regulated by the Federal Executive through the Ministry of the Economy in accordance with the provisions of the Mining Law, specifically articles 6° (1) and 7° (2).

The tendency of metal prices in recent years suggests that mining could have a material direct and indirect impact on how a country's economy is shaped. In other words, mining contributes jobs, increases or reduces government revenues, and increases opportunities for economic growth and diversification.

In recent years, the Foreign Investment Law has undergone significant amendments, and free trade agreements have been signed with some of the world's largest economies, contributing certainty to investment decisions.

The mining sector is one of Mexico's biggest economic engines, and as a result of the current economic and social environment, the Mining Law has undergone some amendments because of Energetic Reform in connection with Hydrocarbons and Electrical Industry.



**(1) Article 6.** *The exploration, exploitation, and use of the minerals or substances referred to in this Law are public, these activities will be preferential over any other use of the land subject to the conditions set forth therein; furthermore, these activities may only be taxed at the federal level.*

*The preferential basis of the activities mentioned above will not have effect over the exploration and extraction of oil and other hydrocarbons; as well, over public service of transmission and distribution of electricity.*

**(2) Article 7.** *Ministry of Economy attributes - regulate and promote exploration and exploitation; monitor the mining sector program and advise federal executive departments, among other tasks.*

### **The Income Tax Law**

One of the ways the government obtains resources is via income tax.

In Mexico, the following individuals and corporations are subject to income tax:

- Residents of Mexico.
- Parties resident abroad with a permanent establishment in Mexico.
- Residents abroad, on income from a source of wealth located in Mexico.

In the case of corporations, this tax is 30% of annual income; the maximum rate for individuals is 35%.

Any tax loss can be deducted over the following 10 years until fully exhausted.

### **The Special Mining Tax**

In late 2013, Congress approved a new tax applicable to holders of mining concessions. Articles 268, 269, and 270 of the Government Service Charges Law, effective as of January 1, 2014, provide a general explanation of that tax:

1. A tax of 7.5% on the profit arrived at by subtracting the deductions permitted by the Income Tax Law from income arising from the sale of extracted minerals, not including deductions on investments (except those involved in mining prospecting and exploration; and development expenses, such as stripping costs), interest payable and the annual inflation adjustment (**special mining duty or mining royalty**).
2. An additional 50% of the maximum tax charged based on the number of hectares comprising the mining concession in the case of concession holders that do not undertake proven exploration and exploitation work for two years running. As of the twelfth year, the additional duty increases by 100% (**mining duty per hectare**).
3. A .5% tax on gross earnings from the sale of gold, silver, and platinum, based on the argument that mining causes soil erosion (**extraordinary mining duty**).

### **The Value Added Tax Law**

Another tax levied by the government to bring in revenue is Value Added Tax (VAT), which is a consumption tax.

Individuals or corporations engaged in the following activities in Mexico are subject to value added tax:

- The sale of goods.
- Independent services.
- Leasing.
- The importation of goods or services.

The VAT rates charged are 16% and 0%; some activities are exempt. The tax is applied to cash flow.

The mineral and concentrate exports of mining companies are usually taxed at the 0% rate, as are domestic gold sales.

## *The Social Security Law*

The Social Security Law regulates Social Security dues paid by workers and employers, based on point “B” of article 123 of the Mexican Constitution.

The purpose of Social Security in Mexico is to guarantee the right to health, medical attention, means of subsistence, and the social services required to ensure individual and collective well-being, as well as to provide a state-guaranteed pension.

On average, dues payable by workers are 1.12% of wages, while the rate for the employer is 10.15%.

Social Security dues cover the following areas:

- Illness and maternity.
- Occupational risk.
- Disability and life.
- Retirement, redundancy, and old age.
- Nurseries and social benefits.

## *The National Water Law*

Mexico is blessed with numerous water resources, such as rivers and lakes dotted throughout the country.

Given ongoing urban development and the appearance of new factories that generate different types of waste, the National Water Law was passed to protect the country’s water resources.

The law is intended to regulate the exploitation or use of Mexican water, its distribution and control, and preserve the quality and volume of water with a view to achieving sustainable and comprehensive development.

The provisions of this law apply to all water in Mexico, whether on the surface or underground.

## *The Federal Environmental Responsibility Law*

The Department of the Environment and Natural Resources (SEMARNAT, for its acronym in Spanish) regulates the Federal Environmental Responsibility Law.

This Law regulates environmental responsibility for damage caused to the environment as well as repair and compensation when enforceable through the federal legal processes provided for in the article 17 of the Constitution, alternative mechanisms for resolving disputes, administrative procedures, crimes against the environment and environmental management.

The Federal Environmental Responsibility Law applies to individuals and corporations whose actions or negligence cause direct or indirect damage to the environment and are therefore required to repair the damage, or when repair is not possible, to pay the respective compensation.

## *The Public Mining Services Manual*

The Public Mining Services Manual is intended to:

- Indicate the channels and formats for the presentation and processing of requests, notifications, reports and applications filed at the Department of the Economy.
- Establish the methods, terms and conditions for preparing the map.
- Determine the means of referring to the new starting point.
- Provide guidelines and procedures for drawings involving simultaneous requests.
- Specify the features of the landmarks marking the starting-points.
- Establish specifics for control markers, topographic links and the map on which they are shown.
- Specify the features of mining cartography.
- Establish other administrative provisions to facilitate the handling of mining affairs.

## *The Federal Firearms and Explosives Law*

One of the mining industry’s main inputs is explosives, which are required in the ore extraction process.

The permits required for handling explosives are granted by the Ministry of Defense with the Interior Ministry’s approval and without prejudice to the attributes of other competent authorities.

Those permits include:

- I.** General permits issued to companies permanently engaged in mining activities;
- II.** Ordinary permits, issued in order to do business with other companies or with foreign parties, and to companies with current permits,
- III.** Extraordinary permits, issued to parties occasionally engaged in the operations mentioned in the law.

In certain circumstances, the Department of Defense may refuse, suspend or cancel permits at its own discretion.

## Profit-sharing

It is the constitutional right of workers or employees to participate in a company's or employer's earnings arising from its operations or services.

Workers participate in the profits of companies in accordance with the percentage determined by the National Commission for Employees' Statutory Profit Sharing, which is currently 10%.

Payment is made sixty days after the date on which the annual tax payment is due (March 31), which means that corporations subject to the general regime must pay workers their share of the profits no later than May 30, while individuals engaged in business activities must do so by June 29.

Recently incorporated companies are exempt from this obligation during the exploration phase.

## Labor unions

A labor union is an association of workers or employers created to study, improve and protect the rights of each and does not require prior authorization; additionally, parties are free to decide whether or not they wish to join a union. Labor unions are regulated by the Federal Labor Law.

Labor unions can be formed by employers of one or several types of activities or formed by employers of one or several types of activities of different states.

Labor unions can be of the following types:

- Trade associations: Formed by individuals of the same profession.
- Corporate: Formed by individuals employed by the same company.
- Industrial: Formed by individuals engaged in operations of the same sector.
- Domestic industry: Formed by individuals working at companies belonging to the same sector but located in different states.
- Mixed: Formed by individuals of different professions.

## Types of companies

The different types of companies mentioned in Mexican legislation are:

- General Partnerships (SNC, for its acronym in Spanish).
- Limited Liability Partnerships (S en C, for its acronym in Spanish).
- Private Limited Liability Companies (S. de R. L. for its acronym in Spanish).
- Stock companies (SA, for its acronym in Spanish) – can include variable capital (S. A. de C. V.).
- Stock companies investment promotion (SAPI, for its acronym in Spanish).
- Stock Partnerships (SCA, for its acronym in Spanish).
- Cooperative Corporation (S Coop, for its acronym in Spanish).
- Civil Company (SC, for its acronym in Spanish).

The features of each type of company must be determined and depending on the degree of participation involved, they can be public, private or mixed, domestic or multinational.

In Mexico, most companies are variable capital stock companies. Some of their features are:

- The corporate name is chosen by the shareholders and must be followed by S.A. de C.V.
- The obligations of the partners are limited to the payment of their stock.
- The capital stock is represented by shares at a value determined by the stockholders.
- There is no limit on the number of shares a shareholder can hold.
- Capital consists of shareholder contributions (in money or assets).

### Current international agreements

Mexico has signed agreements for the avoidance of double taxation with the following countries:

Argentina	Czech Republic	Israel	Pakistan**	Thailand**
Aruba	Denmark	Italy	Panamá	Netherlands Antilles
Australia	Ecuador	Jamaica**	Perú	Netherlands
Austria	Estonia	Japan	Poland	Philippines
Bahamas	Finland	Kuwait	Portugal	Turkey
Bahrain	France	Latvia	Qatar	Turks and Caicos Islands
Barbados	Germany	Lebanon**	Romania	United Arab Emirates
Belgium	Gibraltar	Liechtenstein	Russia	Ukraine
Belize	Greece	Lithuania	Samoa	Uruguay
Bermuda	Guatemala	Luxembourg	Saint Lucia	Vanuatu**
Brazil	Hong Kong	Malaysia**	Saudi Arabia**	Venezuela
British Virgin Islands	Hungary	Malta	Singapore	United Kingdom
Canada	Iceland	Marshall Islands**	Slovak Republic	USA
Cayman Islands	India	Morocco**	Slovenia**	
Chile	Indonesia	Monaco**	Spain**	
China	Ireland**	Nicaragua**	South Africa	
Colombia	Island of Guernsey	Norway	South Korea	
Cook Islands	Island of Jersey	New Zealand	Sweden	
Costa Rica	Isle of Man	Oman**	Switzerland	

\*\*In negotiation.

Source: Ministry of Finance and Public Credit, 2015.



## Appendix IV

### Foreign Trade Advantages

#### Setting up a Company in Mexico – Foreign Trade Advantages

##### I. Treaties and Trade Agreements

As a result of trade agreements with North America, Latin America, Europe and Asia Pacific, Mexico is now a gateway to a potential market of more than one billion consumers, approximately 60% of global GDP.

##### North American Trade Agreement

##### Latin American Agreements

##### European Agreements

##### Asia-Pacific Agreements

Within the region, Mexico has the largest number of treaties and trade agreements, making it an attractive country with multiple benefits for investment.

Mexico currently has eleven Free Trade Agreements (FTA), nine Trade Agreements (Economic Complementation Agreements and Partial Scope Agreements), which allow for preferential tariffs on imported goods.

Mexico also actively participates in multilateral and regional organizations and forums, such as the World Trade Organization (WTO); Asia-Pacific Economic Cooperation (APEC); Organization for Economic Cooperation and Development (OECD); and Latin American Integration Association (ALADI, for its acronym in Spanish).

The country has also signed International Investment Agreements (IIA); i.e., foreign investment agreements designed to promote and protect foreign investment in Mexico and Mexican investment abroad, and which contribute to a favorable business environment. These agreements provide mechanisms for settling disputes between states or between an investor and the state.

On June 18, 2012, Mexico officially joined negotiations with the Trans-Pacific Partnership Agreement (TPP), after it was formally announced that the members extended an invitation to Mexico.

The TPP is currently the largest and most ambitious plurinational trade negotiation, because of the range of products and disciplines covered as well as the number of participating countries. In 2011, these countries represented the 18% of imports, 15% of exports, and almost one third (26 percent) of the global GDP.

##### Benefits for Mexico's mining industry

In order to benefit from preferential tariffs, companies must submit properly filled out Certificates of Origin that declare goods imported with preferential tariffs.

Preferential tariffs can be applied to import transactions under the definitive or temporary import regime (under the IMMEX program), which will be explained in page 99.

The application of said tariffs, directly reduces transaction costs.

##### Implications

Strict control and correlation of Certificates of Origin under the respective Free Trade Agreement or Trade Agreement is required. Correlation at the tariff item and part number level is required (especially in the case of goods that can be identified individually, such as fixed assets).

### Mexico's Treaties and Free Trade Agreements

Name of the Treaty or Agreement	Signatory Countries
North American Free Trade Agreement (NAFTA)	Canada
	USA
	Mexico
G3 Trade Agreement	Colombia
	Mexico
Mexico-Chile FTA	Chile
	Mexico
Mexico-Israel FTA	Israel
	Mexico
Mexico-European Free Trade Association	Iceland
	Liechtenstein
	Norway
	Switzerland
	Mexico
Mexico- Uruguay FTA	Uruguay
	Mexico
Mexico-Central America FTA	Costa Rica
	El Salvador
	Guatemala
	Honduras
	Nicaragua
	Mexico
Mexico-Japan Economic Partnership Agreement	Japan
	Mexico
Mexico-Peru Trade Integration Agreement	Perú
	Mexico
Mexico-Panama FTA	Panamá
	Mexico

FTA=Free Trade Agreement

Name of the Treaty or Agreement	Signatory Countries	
Decision No. 2/2000 Mexico-EU FTA (MEFTA)	Germany	Hungary
	Austria	Ireland
	Belgium	Italy
	Bulgaria	Latvia
	Cyprus	Lithuania
	Croatia	Luxembourg
	Denmark	Malta
	Slovakia	Netherlands
	Slovenia	Poland
	Spain	Portugal
	Estonia	UK
	Finland	Czech Republic
	France	Romania
	Greece	Sweden
	Mexico	

Name of the Treaty or Agreement	Signatory Countries	
ALADI (Latin American Integration Association)	Argentina	Colombia
	Bolivia	Ecuador
	Brazil	Paraguay
	Chile	Perú
	Uruguay	Venezuela
	Cuba	Panamá
		Mexico

Source: Department of Economy, 2015.

## **II. Program: Manufacturing, Maquila and Export Services Industry (IMMEX):**

### **Imports into Mexico**

In order to favor the economic and productive development model, companies may import goods under the following arrangements:

#### *Definitive importation*

Entry of foreign source merchandise for an unlimited period of time with payment of the respective customs duties and VAT and compliance with non-tariff regulations.

#### *Temporary importation*

Entry of foreign source merchandise for a limited period of time (under the IMMEX program) not subject to VAT, and in the case of commodities or inputs, not subject to customs duties.

### **Advantages of exporting from Mexico**

Mexico allows the return abroad or exit of merchandise, free of payment of the export VAT (with the exception of certain products) and free of customs duties.

### **Fixed asset imports / considerations**

When fixed assets are imported under the IMMEX Program, the importer must have a control in place capable of determining the location of the fixed assets in question at its facilities, and must hold all the documents and accounting necessary to support their legal importation into Mexico.

According to the Customs Law, importers or exporters must submit an officially approved order accompanied by supporting documents for the goods being imported or exported, transported or stored (invoices, declarations, statements, customs value documents, among others).

Likewise, it is important to ensure that the correct value is declared to customs, as it is the basis for calculating customs duties.

### **VAT Certification**

As of 2015, items temporarily imported by IMMEX companies are subject to VAT and/or excise tax, with the exception of taxpayers holding a VAT and excise tax certification.

Note: It is important for companies to secure this certification from the SAT in order to avoid the financial cost involved in temporarily imported IMMEX items as from 2015.

It should be pointed out that the certification requirements include adequate controls over imports and exports and prompt compliance with Mexican Social Security obligations and regulations.

### **Benefits for the Mexican mining industry**

Under the IMMEX program, companies holding VAT and excise tax certification may temporarily import fixed assets without the need to pay VAT. This arrangement avoids the financial cost and the impact on cash flow.

## **III. Binational Business Chamber**

The Department of the Economy of Zacatecas has a Binational Business Chamber intended to open trade and distribution channels in the US, in order to allow rapid entry into the market, generating a solid relationship between Zacatecas entrepreneurs resident in both countries, and the promotion of the state as a good place to invest.

### **Functions**

- Trade representation in the US.
- Consulting: Providing expert advice on determining market needs, identification of the target market, distribution channels, market prices and logistics strategies.
- Promotion of foreign investment in Zacatecas.

Source. SECON- Zacatecas



## IV. Statistics

### **IMMEX company exports and imports**

**IMMEX (Manufacturing industry, in-bond, and export services program)**

Imports and Exports of IMMEX Companies in the state of Zacatecas (Values in millions of Dollars)						
	Jan-Dec 2010		Jan-Dec 2011		Jan-July 2012	
	Exports	Imports	Exports	Imports	Exports	Imports
IMMEX domestic Total	228,250	152,670	258,067	167,786	161,641	102,665
IMMEX state Total	897.51	184.45	1,776	359.39	1,194	216.68
X vs. IMMEX domestic Total	0.39	0.12	0.69	0.21	0.74	0.21

Source: Department of the Economy, Directory of IMMEX companies, information as of July 2012.

Note: There are approximately 34 IMMEX registered companies in Zacatecas, of which eight belong to the mining sector.

## Appendix V. Competitive costs

Cost of water	
Available water	Availability, at a capacity of 12 L per second in industrial parks
Cost of water	23.58 pesos per cubic meter
Cost of drainage discharge	4.71 pesos per cubic meter, depending on the treatment provided by each company
Maximum water flow	10-inch sanitary drainage network
Cost of gasoline/diesel	
Cost of gasoline	Magna 13.57 pesos per liter or US\$0.82 per liter Premium 14.38 pesos per liter or US\$0.87 per liter
Cost of diesel	14.20 pesos per liter or US\$0.86 per liter
Cost of building	
Cost of land	Approximately US\$24 per square meter
Cost of building	5,000 pesos or US\$375.37 per square meter
Price of rent	35 pesos or US\$2.62 per square meter
Transportation	Urban and intercity. Routes at all industrial parks
Cost of natural gas	
Reference price	US\$2.72 per million BTU
Fiber optics	
Zacatecas has a network of fiber optics.	

Source: The Zacatecas Department of the Economy, 2014, Energy Regulatory Commission (CRE for its acronym in Spanish).

Mexico boasts more than 30,000 km of fiber optic cables.

Baja California



Source: Energy Regulatory Commission (CRE for its acronym in Spanish), 2014.

## Appendix VI.

### Relevant Aspects of the Ecological Balance and Environmental Protection Law (LGEEPA for its acronym in Spanish)

#### About the LGEEPA

- The LGEEPA is a tool that guarantees the sustainability of economic activity. Its purpose is the preservation and restoration of environmental balance and environmental protection in Mexico.
- Its provisions are of public and social interest and are intended to promote sustainable development and establish the bases for:
  - I. Guaranteeing the right of all individuals to live in an environment favoring their development, health and well-being.
  - II. Determining the principles of environmental policy and the instruments required for its application.
  - III. Preserving, restoring and improving the environment.
  - IV. The preservation and protection of biodiversity as well as the establishment and administration of protected natural areas.
  - V. The sustainable use, preservation and reclaiming of the soil, the water and other natural resources in a way that it is compatible with the production of economic benefits and the activities of society with the preservation of eco systems.
  - VI. The prevention and control of air, water and soil pollution.
  - VII. Guaranteeing the responsible participation of the population (either individually or collectively) in preserving and restoring ecological balance and environmental protection.

- VIII. Exercising the environmental attributions pertaining to the Federation, the states, the Federal District and the municipalities, under the concurrence principle contemplated in article 73 section XXIX-G of the Constitution.
- IX. Establishing the coordination, induction, and agreement mechanisms among the authorities, between the authorities and the social and private sectors, and with persons and social groups with concerns for the environment.
- X. Establishing control and security measures that will guarantee compliance with and application of this Law and its provisions, as well as application of the respective administrative and penal sanctions.

#### LGEEPA Regulations

These regulations derived from the law are applicable to the general population in Mexico and are intended to regulate the law in different areas.

- Regulations to the General Law of Ecological Balance and Environmental Protection as Concerns The Evaluation Of Environmental Impact.
- Regulations to the General Law of Ecological Balance and Environmental Protection As Concerns Ecological Framework.
- Regulations to the General Law of Ecological Balance and Environmental Protection as Concerns Self-regulation and Environmental Audits.
- Regulations to the General Law of Ecological Balance and Environmental Protection as Concerns Emissions Recording and the Transfer of Pollutants.
- Regulations to the General Law of Ecological Balance and Environmental Protection as Concerns the Control and Prevention of Atmospheric Pollution.
- Regulations to the General Law of Ecological Balance and Environmental Protection as Concerns Protected Natural Areas.

#### About the General Law on Climate Change

- This law is of public and social interest and applicable throughout Mexico.
- Its purpose is to:
  - I. Guarantee the right to a sound environment and establish concurrence of faculties of the Federation, the federal entities, and the municipalities in drawing up and applying public policies for adapting to climate change, and the mitigation of gas emissions and greenhouse gases.
  - II. Regulate gas emissions and greenhouse gases with a view to stabilizing their concentration in the atmosphere at a level that will prevent hazardous man-made interference with the climate system considering (where applicable) the provisions of Article two of the United Nations Convention on Climate Change and any provisions arising therefrom.
  - III. Regulate actions for mitigating and adapting to climate change.
  - IV. Reduce the vulnerability of the population and the country's ecosystems to the adverse effects of climate change and to create and strengthen the national capability of responding to that phenomenon.
  - V. Promote the education, research, development, and transfer of technology and innovation and dissemination of methods of adapting to and mitigating climate change.
  - VI. Establish the bases for agreement with society.
  - VII. Promote a transition towards a competitive, sustainable, and low-carbon-emission economy.

## **Regulations to the General Law on Climate Change as Concerns the National Emissions Register**

The October 28, 2014 Official Gazette carried the Regulations to the General Law on Climate Change, which establishes the guidelines for the National Admissions Register.

These regulations regulate the reporting of greenhouse gases generated by establishments and/or companies engaged in production, commercial or service operations.

Activities considered to qualify as establishment required to report are:

### **I. The Energy Sector**

- Subsector generation, transmission, and distribution of electricity.
- Subsector exploitation, production, transportation, and distribution of hydrocarbons.

### **II. The Transportation Sector**

- Subsector air transport.
- Subsector railway transport.
- Subsector marine Transport.
- Subsector overland transport.

### **III. The Industrial Sector**

- Subsector chemical industry.
- Subsector steel.
- manufacturing industry.
- Subsector metallurgy.
- Subsector metal mechanic industry.
- Subsector mining industry.
- Subsector automotive manufacturing.
- Subsector cellulose and paper industry.
- Subsector graphic arts industry.
- Subsector petrochemical industry.
- Subsector cement and lime industry.
- Subsector glass industry.
- Subsector electronics industry
- Subsector electronics industry.
- Subsector food and beverage industry.
- Subsector wood industry.
- Subsector textile industry .

### **IV. The Agricultural Sector**

- Subsector agriculture.
- Subsector cattle raising.

### **V. The Waste Sector**

- Subsector residual water.
- Subsector solid urban waste and special treatment waste, including final disposal.

### **VI. The Trade and Service Sector**

- Subsector construction.
- Subsector trade.
- Subsector educational services.
- Subsector recreational and entertainment activities.
- Subsector tourism.
- Subsector medical services.
- Subsector government.
- Subsector financial services.

Establishments Subject to Reporting must submit the information pertaining to their greenhouse gases if the sum total of said gases (direct or indirect) is 25,000 or more tons of carbon dioxide equivalent (tonCO<sub>2</sub>e), arising, for example, from the consumption of electricity and fuel such as gasoline, diesel, natural gas, fuel oil, etc.

### **References of interest**

General Law of Ecological Balance and Environmental Protection, available from: <http://www.semarnat.gob.mx/leyes-y-normas/leyesfederales>

The LGEEPA Regulations, available from:

<http://www.semarnat.gob.mx/leyes-y-normas/reglamentos-del-sector>

The General Law of Climate Change,

available from: [http://www.diputados.gob.mx/LeyesBiblio/pdf/LGCC\\_130515.pdf](http://www.diputados.gob.mx/LeyesBiblio/pdf/LGCC_130515.pdf)

Regulations to the General Law on Climate Change as Concerns the National Emissions Register, available from: [http://www.diputados.gob.mx/LeyesBiblio/regley/Reg\\_LGCC\\_MRNE\\_281014.pdf](http://www.diputados.gob.mx/LeyesBiblio/regley/Reg_LGCC_MRNE_281014.pdf)



***Appendix VII. List of groups or mining companies analyzed in this document.***

- |   |  |
|---|--|
| 1. Agnico Eagle Mines Ltd.                          | 24. Grupo México   |
| 2. Alamos Gold Inc.                                 | 25. Impact Silver Corp.  |
| 3. Amarium Minerals Inc.                            | 26. Industrias Peñoles   |
| 4. Argonaut Gold Inc.                               | 27. Industrias Peñoles 51%/Dowa Mining Company Ltd./Sumitomo Corp. |
| 5. Arian Silver Corp.                               | 28. Minera Frisco  |
| 6. Aura Minerals                                    | 29. Negociación Minera Santa María.                                |
| 7. Aurcana Corp.                                    | 30. New Gold Inc.  |
| 8. Aurico Gold Inc.                                 | 31. NWM Mining Corp.   |
| 9. Avino Silver & Gold Mines Ltd.                   | 32. Nyrstar  |
| 10. Capstone Mining                                 | 33. Pan American Goldfields Ltd. 80%/Río Tinto Plc                 |
| 11. Coeur Mining                                    | 34. Pan American Silver Corp.                                      |
| 12. Endeavour Silver Corp.                          | 35. Primero Mining Corp./Goldcorp Inc.                             |
| 13. Excellon Resources Inc./Golden Minerals Company | 36. Red Tiger Mining Inc.  |
| 14. First Majestic Silver Corp.                     | 37. Río Tinto Plc  |
| 15. Fortuna Silver.                                 | 38. Rochester Resources Ltd.                                       |
| 16. Fresnillo Plc                                   | 39. Rose Petroleum Plc   |
| 17. Fresnillo Plc /Newmont                          | 40. Scorpio Mining Corp.   |
| 18. Gold Resource Corp.                             | 41. Sierra Metals  |
| 19. Goldcorp Inc.                                   | 42. Silver Crest Mines Inc.  |
| 20. Golden Minerals Company                         | 43. Starcore International Mines Ltd.                              |
| 21. Goldgroup Mining Inc.                           | 44. Timmins Gold Corp.   |
| 22. Great Panther Silver Ltd.                       | 45. Yamana Gold Inc.   |
| 23. Grupo Bacis                                     |  |

Source: Source: Information obtained from CAMIMEX currently in the process of being reconciled with the Ministry of the Economy, Operating Mine Outlooks, Infomine and [www.24hgold.com](http://www.24hgold.com).

Note: For the purpose of the variable per state share of precious and non-ferrous industrial metals exploration projects, as of December 31, 2013; in addition to the 45 above listed companies, the analysis included other 348 companies and 63 natural persons or groups of natural persons with exploration projects.



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AND PULL  
HERE

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