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MEXICO STEEL AND IRON **2018**



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Dear Reader,

As Mexico entered into 2018, it is fair to say it did so with a mixture of pride and trepidation. Mexico's economy has been growing steadily, if not spectacularly, over recent years and is now the world's 11th largest economy (in Purchasing Power Parity terms). Mexico has looked like a bastion of stability compared to some of its Latin American peers and boasts a strong manufacturing base, in particular its automotive industry, which has been boosted by the introduction of NAFTA since 1994. Mexico is now the world's seventh largest vehicle producer and fourth largest vehicle exporter.

However, the country was traumatized by two earthquakes in September 2017 which left hundreds dead. Some turbulent times may lie ahead for the country as President Trump of the United States is threatening to pull out of NAFTA and general elections in 2018 could prove disruptive: the frontrunner López Obrador has threatened to cancel President Peña Nieto's signature energy reform aimed at liberalizing the country's inefficient oil and gas industry. At the same time, analysts report that 2017 was Mexico's most violent on record.

Despite the choppy waters, Mexico's steel and iron industry is in relatively optimistic spirits. In 2017, Mexico consumed over a third more than its regional rival Brazil and is not far behind it in terms of production either. Although there are lingering fears of global oversupply, Mexico's steel production looks set to increase.

Its strong industrial base, reconstruction after the earthquakes, the government's special economic zones policy to attract investment into poorer regions and the construction of the New Mexico City International Airport (NAICM) are all expected to drive demand. Quality not quantity, however, is on most players' lips and the sector is anticipating big investments towards this end. Ternium and ArcelorMittal both announced investments of over US\$1 billion in Mexico in 2017. Ternium's investment is focused on meeting demand for high value-added steel in the automotive industry, whilst ArcelorMittal's will enhance its value-added portfolio for non-auto steel. The investments are also intended to help plug Mexico's gaping trade deficit of roughly 3.7 million mt/y of steel. Backing this trend, Mexico's government has shown it is not afraid to act decisively in support of the steel industry and has introduced numerous anti-dumping measures in the last few years.

In addition to exclusive interviews with some of the most innovative companies and important influencers in the industry, this report looks at the sector's recent performance and prospects for the future, macro drivers, the key end-use markets and the technological trends shaping productivity and quality. As Mexico navigates a pivotal year, this report will serve as a valuable guide to help the reader survey the potential of an industry growing in importance to the country's economy.



A handwritten signature in black ink, appearing to read 'Fernando Gutiérrez'.

Fernando Gutiérrez
President
Colegio de Ingenieros Civiles de México,
Mexico's Association of Civil Engineering (CICM)

A handwritten signature in black ink, appearing to read 'Alice Pascoletti'.

Alice Pascoletti
General Manager
Global Business Reports (GBR)



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Mexico

- International Boundary
- - - State Boundary
- ★ National Capital
- State Capital

UNITED STATES



MEXICO STEEL AND IRON 2018
Industry Explorations
 Global Business Reports

This research has been conducted by
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Macro Picture

"We are big believers in free trade but it must be fair trade as well. For that reason, we take actions quickly when we detect non-fair trade practices in markets."

- J. Rogelio Garza Garza,
Undersecretary of Industry and Commerce,
Ministry of Economy

Macroeconomic Determinants

The NAFTA negotiations may be a cause for concern for some but there are also plenty of factors which should drive demand for steel production in Mexico in 2018 and beyond.

As Mexico's steel industry is propelled into the future, there are plenty of factors that should give the industry optimism. The construction of the Mexico City New International Airport (NAICM), the introduction of Special Economic Zones (SEZs), earthquake reconstruction, and other major infrastructure plans are expected to stimulate steel demand significantly. However, the ongoing NAFTA renegotiations continue to loom over the industry, creating a precarious business environment for companies that otherwise might be making investments into Mexico.

NAFTA You, I Insist

At this point, predicting the outcome of the NAFTA renegotiations would be speculation, so American OEMs with operations in Mexico are still understandably worried about the risk. In November 2017, the CEOs of General Motors, Fiat-Chrysler, and Ford Motor met with the United States administration to voice their concerns about potentially high tariffs and a possible withdrawal from the agreement. General Motors' CEO Mary Barra has decided to continue producing the 2018 Chevrolet Cruze in Mexico, despite threats of large tariff increases, citing investments that have already been made, as well as long lead times required by the automotive industry.

"The automotive industry works very well because there are few constraints on trade in the NAFTA region. If more constraints are added, consumers across the region may end up paying higher prices,"

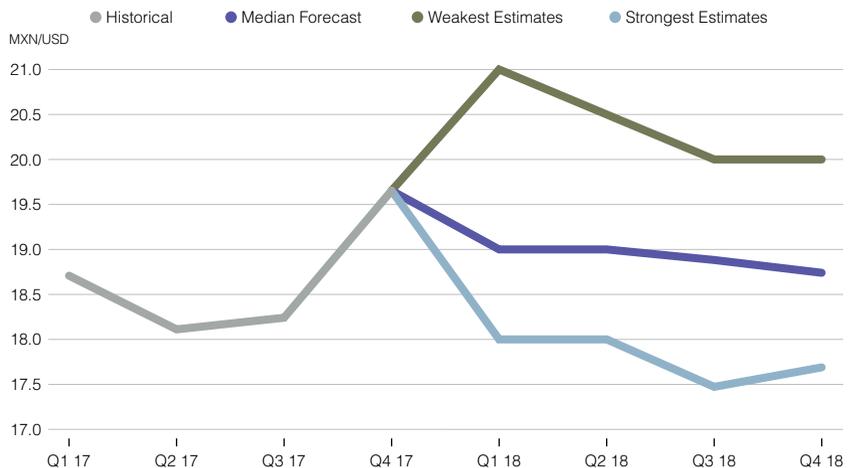
said Leopoldo Cedillo, CEO of Metalsa. "NAFTA countries may also lose competitiveness as, for example, a German supplier may calculate that there is little benefit to basing itself in Mexico if it can ship from Germany and pay the same import duties under World Trade Organization rules. The United States is proposing that more components be built there, but getting rid of NAFTA does not make sense because it kills the whole point of being based there, unless the United States decides to quit the World Trade Organization, which would be total protectionism."

The NAFTA renegotiations, the United States tax reform, and the Mexican presidential election are all reasons for Mexican companies to be cautious, as any combination of outcomes could have significant ramifications on international trade. "These

macroeconomic factors could affect our industrial base and possibly limit our supply," said Jorge Zambrano, CEO of Zimmer Recycling, whose scrap metal sourcing depends directly on the manufacturing activity of its suppliers. "We are being more cautious in terms of investments and we are deferring many of our capital expenditures until after these factors are better defined." On the other hand, some businesses seem to be back on track after an initial hesitation phase. If heavy equipment sales are a strong indicator of the industry's health, then perhaps Mexican companies have begun to stop worrying about the NAFTA results. According to David Decker, vice president of the NAFTA region of induction furnace manufacturer ABP Induction Systems: "Several of our clients held off on making any critical decisions for about the

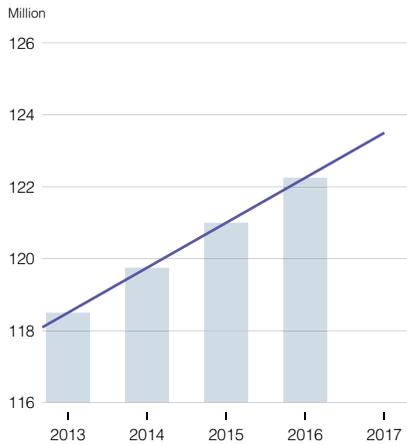
PESO POTENTIAL

Source: Bloomberg



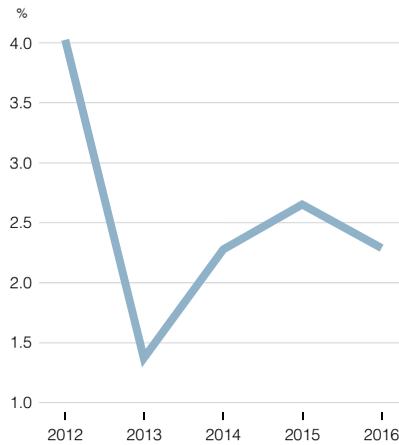
MEXICO POPULATION

Source: Consejo Nacional de Población



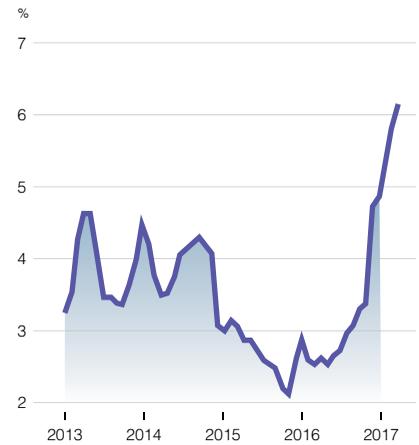
MEXICO GDP GROWTH RATE

Source: The World Bank



MEXICO INFLATION RATE

Source: Instituto Nacional de Estadística y Geografía (INEGI)



first six months after the new US administration took over. After being at a standstill from January to July 2017, companies restarted their growth strategies. Despite the slow start, 2017 has been a record year for our systems sales.”

Regardless of any investment hesitations, most players in the industry are optimistic that NAFTA will incur some necessary updates but ultimately not come to an end. Steel distributor Ferrecabsa’s COO, Ricardo Fernandez, concisely summed up the Mexican market’s widespread sentiment: “The general consensus is that NAFTA will remain alive and that all of the rumors about it are mostly just noise. Mexico has good deals with the United States and both economies are too heavily engaged with each other for there to be any major changes.”

Steel Stimulants

On the other extreme of the market confidence spectrum, uncertainty surrounding NAFTA can be offset by some of the sizable construction projects and public sector initiatives 2018 has in store. The most important construction project affecting Mexico’s steel and iron industry is the NAICM, which is expected to be the world’s second largest airport upon its full completion in 2065. The first terminal, with an expected capacity of 68 million passengers, is in the early stages of construction and is expected to open by October 2020. The project is estimated to cost US\$13.3 billion, 60% of which will be funded by the Mexican gov-

ernment, and steel will be the most highly demanded material.

Seven of the 45 companies that bid on the construction of the airport were awarded contracts, forming a consortium that includes Mexican companies Carso Infrastructure and Construction (CICSA), GIA, the ICA Group, La Peninsular, and Prodemex and Spanish companies FCC and Acciona. “All of the companies working on the NAICM construction are bringing their expertise to the specific areas in which they are needed,” said Sergio Ramírez, general director of Acciona Infraestructuras. “The consortium operates as a joint venture, and the project is quite complicated. All of the people on the project are working hard to keep the timeline moving according to plan.”

Earthquake reconstruction will also be a significant boost to the steel sector, as the majority of the buildings that fell during the disasters would not have fallen had steel been used instead of concrete. According to Gustavo Arballo, president of the Mexican Chamber of Construction (CMIC): “In total, earthquake reconstruction will cost more than US\$2.5 billion over a wide range of states. Steel and iron will be used much more than before, including in the construction of 30,000 to 40,000 new houses, regardless of size. We are recommending that these houses have a certain standard of earthquake resistance. Most of the houses or buildings that fell had none of the basic structural requirements. The reconstruction will all be completed within the next 12 to 18 months, which is a difficult deadline to meet.”

In 2016, President Peña Nieto signed legislation allowing for the creation of five SEZs, which will offer tax breaks for companies considering investing in underdeveloped Mexican states. Three of the five SEZs are currently open for development; Puerto Chiapas, Lázaro Cárdenas, and Coatzacoalcos. The SEZs in Salina Cruz and Oaxaca have been delayed, the latter due to earthquake damage. “Meeting all the infrastructure needs will require materials from the iron and steel sector that have not been considered before, including imported products,” said Gustavo Arballo. “In a short period of time, we are expecting direct investments to build the factories and plants required in those areas. The increase in professional training is a major benefit of these investments, which means bigger salaries and better jobs.”

Ironically, some of the optimism around the Mexican steel sector may have emanated from the United States government. Guessing whether or not the United States administration’s infrastructure promises will come to fruition is as good as flipping a coin, but companies must prepare for the demand nonetheless. In a sardonic turn of events, it is likely the United States would have to import much of its steel from Mexico if these plans, including the elusive border wall idea, are executed. “We export about 20% of our total volume to the US,” said Mario Tijerina, CFO of scrap metal recycling company Roca Acero. “In general, the ‘Trump Effect’ has had the biggest positive short-term impact on the steel market because of the infrastructure promises the current US administration has made.” ■



J. Rogelio Garza Garza

Undersecretary of Industry and Commerce

MINISTRY OF ECONOMY

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What have been the Ministry's key achievements in the last few years and what are some of its main priorities in helping Mexico's industry today?

When we first entered government in December 2012, we conducted a diagnosis of the economy and policies supporting it, which led to the government launching the structural reforms. All of these reforms have been important for Mexican industry but four stand out: the energy, financial, labor and education reforms. We have continued the policy of openness in terms of Mexico's economy and its trade relations, which we believe is the best path for Mexico.

In addition, we have launched a new industrial policy based on Industry 4.0. If we want to move to higher value-added manufacturing, we need to develop human capital, SMEs and have more accommodating laws. There are two main ways we work in Mexico – supporting the north which requires help with things like Industry 4.0 and parts of the south which need different assistance through policies like the special economic zones. Furthermore, we want to create a completely new educational model to adapt to technological change.

How confident are you in the trade environment for Mexico going forward?

There have been more advances in the modernization of the trade agreement with the European Union than NAFTA and it is possible by December 2016 we may be close to finalizing the agreement with the EU. Whilst there are some issues to smooth over, there is little risk of any negative scenarios. It is a different story with the United States. Now we are in the process of showing our red lines in the negotiation on issues, such as rules of origin. The next round in January 2018 will be crucial for the trajectory of NAFTA. We are confident we will find a way to get an agreement.

The steel industries in the United States and Mexico work together a lot, and we do not see problems with this going forward. The United States has some concerns about

China but these are also the same concerns as Mexico holds. We need to find a situation where we can work together under fair trade. It is clear China is not competing in this way when it comes to steel; therefore we have taken these actions. There may be more anti-dumping measures but we cannot predict this as it depends on what the industry demands; the Ministry will not launch an investigation by itself.

What are the prospects for the steel industry going forward?

The steel industry has grown a lot in the last two to three years and Mexico now produces nearly 19 million mt/y. With the over US\$2 billion combined announced investments by Ternium and ArcelorMittal into new plants, Mexico's capacity will grow even more. Both new plants also have plans to work with the automotive sector, so the industry is also moving up the value-chain. Factors such as the reconstruction after the earthquake will be a boost to the industry as construction increases. We expect GDP to grow at 2% or more in the coming years and this will keep demand high for steel.

Where will Mexico's economy be in three years' time and why should investors view it as a top business destination?

In the last few years, we have shown Mexico is committed to promoting investment and proven our capabilities. We invest in infrastructure, human capital and technology. Also, we have shown that we have macroeconomics under control. We do not play with this, although this is a concern going forward depending on who wins the presidency in 2018. All recent finance ministers, such as José Antonio Meade and Luis Videgaray Caso, have had a clear vision about working with macroeconomics which has given certainty to investors. This is essential for the future. Hopefully, we will continue with more than 2% growth. With the global scenario as it is, if we maintain this level it shows we have managed the economy with a lot of care. ■



Paulo Carreño King

CEO
PROMÉXICO

What have been some of the major achievements of ProMéxico in supporting the Mexican economy in recent years?

ProMéxico is the ideal ally of companies that seek to invest in our country. We guide them in selecting locations, as well as in identifying markets, customers, and partners. We also take them throughout the investment process by facilitating its operation and minimizing risks. ProMéxico, as the investment promotion agency of the federal government, has intelligence available to potential investors.

Exporting firms that work with ProMéxico achieve better results than those that pursue these same objectives on their own. The exporters that receive our services or assistance grow, on average, 20% more than the rest. Our work also has a social impact. In 2016, about 43 thousand new jobs were created thanks to projects promoted by ProMéxico. This means that we contribute to creating one in every 17 new jobs in our country. From 2013 to October 2017, ProMéxico has confirmed US\$70.5 billion of FDI, which account to a contribution of 43% with respect to the US\$163 billion of the country's total.

How would you characterize the current business climate in Mexico, and what effects could the NAFTA renegotiations have?

Mexico's business climate is becoming more solid. Mexico's position at the NAFTA renegotiation table will continue to be serious and constructive. Nowadays, we see opportunities for a modernized NAFTA to consolidate the logistics platform, promote the convergence of regulatory frameworks, and integrate issues such as energy, e-commerce, and intellectual property rights.

However, if NAFTA was cancelled, we do not anticipate a collapse of the Mexican economy. Given the high degree of integration and interdependence we have with the United States and Canada, North America will continue to be our main market. We are not seeking to change that, nor do we believe that doing so would be convenient given the range of competitive advantages we have built together over decades. What we do pursue is a decrease of our dependence by promoting greater diversification of our business relationships and investment flows. We are currently looking to take advantage of commercial agreements and negotiations in progress in order to identify business op-

portunities with Europe (TLCUEM), Asia (TPP11), and Latin America (Pacific Alliance and associated states), as well as Brazil and Argentina.

What impact will the construction of the NAICM airport, earthquake reconstruction, and anticipated infrastructure investment in the United States have on Mexico's economy?

The importance of the New International Airport for Mexico City project will be significant for the national economy: we will have created more than 760,000 jobs when reaching its maximum capacity, a significant figure if we consider that this is intended to reduce the unemployment rate by 4%. Additionally, we will improve connectivity and mobility in the Valley of Mexico by reducing transfer times and reducing Mexico's international connection costs. This will be one of the most avant-garde airports in the world. The earthquake of September 19th showed that, despite the damages it caused, we have a better infrastructure, civil protection protocols, and much more solid resources than 30 years ago. Initially, the federal government estimated the damages to be of approximately US\$2.116 billion. However, as IMF experts have outlined, the economic impacts of catastrophes tend to be registered in the quarter of the year in which they occur, but reconstruction activities serve as compensatory palliatives.

Where will the Mexican economy be three years from now?

Our economy has performed better than it was expected during the past months. On the other hand, financial market conditions have also improved, at the same time as Mexican peso has appreciated against the US dollar. Our resilience to shocks, prudent responses through monetary and fiscal policy, as well as a gradual improvement in the country's external environment have strengthened our economic activity.

Estimates in the medium and long-term remain positive, with an ever-larger annual GDP growth rate. This will allow us to become the 6th largest exporter and the 8th largest economy in the world by 2050. In terms of the steel and iron sector, according to Marketline, in 2021, the Mexican steel market is forecast to have a value of US\$13.9 billion, an increase of 30.9% since 2016; and a volume of 21.9 million mt/y, an increase of 16.4% since 2016. ■



Juan Carlos Rodrigues

President

ASSOCIATION OF IRON AND STEEL TECHNOLOGY (AIST) MEXICO CHAPTER

Plant Manager

TERNIUMMEXICO

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Could you provide an introduction to AIST and how it supports the steel industry in Mexico?

The objective of AIST is to promote networking within the steel and iron industry in Mexico. We operate through nine committees. Out of those nine committees, four are operational: steel mills, processing lines, rolling, and industrial security. We also have three administrative committees: an editorial committee that works with our magazine, another pertaining to the Congress and Exhibition of the Steel Industry (CONAC) event, which happens every two years, and a third for courses and technical events. We have two educational committees, one for students and one for the Museo del Acero in Monterrey. These committees organize meetings with companies in the industry to create a collaborative network that informs and teaches people about their experiences or new developments. While we are financially independent, we do work very closely with the American AIST.

What are your expectations for CONAC 2018?

We have high expectations for next year's event. CONAC started in 2003. It has become the main technological steel and iron industry event in Mexico. CONAC 2016 had an attendance of 1,600 people, over 100 stands, and more than 80 technical researches presented. Suppliers come to display their latest developments and technologies, and producers show how much the industry has grown and the modernization of their plants. The event opens with a presentation that includes executives from some of the main Mexican steel and iron companies. They talk about the industry and the indicators of the progress and expectations for the future.

How does AIST help develop young talent in the industry?

AIST offers hands-on courses for the iron and steel industry, including subjects from statistical processes control to blast furnace operation, rolling, and lubrication, for example. These courses are held in steel plants, and the company gives a tour showing how it operates. We also have scholarship programs in Santa Catarina for students studying technical careers that apply to the rule of 'neustra industria' (our industry). In this

way we contribute to the training of technical personnel available to the sector and help young people with limited resources to prepare and carry out outstanding work in the industrial sector.

What are the most important technological trends currently affecting the industry?

All industries are making improvements in automation. Safety is the most important reason for this as removing people from dangerous circumstances is now more achievable, but increased performance, production, and control, are also good incentives to automate operations. The steel industry in Mexico is also increasingly responsible with the environment, for example Ternium started a US\$30 million investment in Planta LARGOS Puebla for the treatment of smoke and external adjustments in its plant and many companies are doing the same. If you want to be part of this market, you must be able to commit to long-term sustainability.

What is the significance of the Ternium investment for the Mexican steel industry?

Mexico imports approximately 3.7 million mt/y of steel products. Following this trend, Ternium's investment will create an industrial pole in Pesquería, Nuevo León and will replace approximately 2 million mt/y of products imported to Mexico. Even so, there are still a lot of opportunities to replace imported steel pipelines, but Mexico's growing industry will serve as a barrier and minimize imports. Along with this development, Ternium has already invested in an electrical power station called Techgen, the Roberto Roca technical school, and now a hot rolling mill that will supply the cold-rolled market.

What is your short-term outlook on the Mexican steel and iron industry?

The steel and iron industry in Mexico has a big chance to grow. Despite every threat that shows up, like the ongoing renegotiation of NAFTA or the threat of foreign products, the Mexican industry has shown strength in its resources and capabilities, and it has increased production and investments. Ternium and ArcelorMittal, two of the main steel and iron companies in South America, are leading Mexico with important investments and promoting productivity in the country. ■



Fernando Turner

Secretary of Economy and Labor
STATE OF NUEVO LEÓN

What have been the Ministry of Economy and Labor's most noticeable achievements during your tenure?

In 2017, the Ministry renegotiated Kia's incentives package, which had been approved by the prior government administration. The package was very expensive and difficult for the state to continue funding. We were able to reduce the cost to the state by nearly US\$360 million without upsetting the relationship between the company and the government. In 2016, Nuevo León was Mexico's top recipient of new foreign direct investment. We currently have the lowest unemployment rate we have had over the last 12 years, and salaries are increasing. We have also recently launched several new strategic financing programs aimed at improving the performance of SMEs, and these financings have thus far been used by 700 companies. We are also currently negotiating with US customs to reduce the number of checkpoints to one so that logistics costs are cheaper to companies who export from Nuevo León.

How has the Nuevo León government helped companies adapt to Industry 4.0?

In June 2017, the administration started an initiative called Nuevo León 4.0, which aims to bring the state's public sector, private sector, and universities together to get involved in Industry 4.0 in a way that many other countries have. There are many companies that are interested in this initiative, as well as about 15 to 20 labor unions. This initiative will not only help attract more foreign investment into the state, but it will also attract domestic investment, which still comprises about 90% of the state's total investment. Our goal is to make Nuevo León one of the biggest manufacturing destinations in the world, which will greatly increase the standard of living for our constituents.

How do you expect the NAFTA renegotiations to impact Nuevo León?

We do not perceive a major slowdown in investment as a result of NAFTA. The number of companies that came to Nuevo

León in 2017 was about as high as in any other year. There may be a decrease in foreign companies' equity dividends, but this is related to accounting and not any specific macroeconomic factor. Until NAFTA started being renegotiated, the general foreign investment sentiment about Mexico, and Nuevo León in particular, was very strong from both the US and Asia, and we expect this to more or less continue.

How important is the steel and iron industry to Nuevo León?

Manufacturing is the trademark of Nuevo León and makes up about 24% of the state's GDP. Steel and iron is very important to the state in terms of production units for the automotive industry, as evidenced by recent investments from Ternium and ArcelorMittal. Ternium, in particular, is a very valuable corporate citizen and invests very actively in the needs of the state. In fact, Ternium is not locally perceived as a foreign company, as their most important business occurs in Monterrey. The metalworking industry in Nuevo León is comprised of a few hundred companies that use steel products, and the state produces about 25% of Mexico's automotive parts.

What are the factors that make Nuevo León a top investment destination in Mexico?

Nuevo León is a complete industrial ecosystem. We have excellent technical universities and engineering programs. We also have an excellent workforce that has a healthy relationship with the companies here. The adversarial relationship between labor and management that exists in many other countries does not exist in Nuevo León. The workforce is also accustomed to working in an industrial capacity and is very flexible. Nuevo León is also very well located from a logistics standpoint in that we are easily accessible by air, road, and railway, and we are near the US. Our large companies also employ the latest technologies, which is attractive for both foreign experts and young engineers to come work here. ■

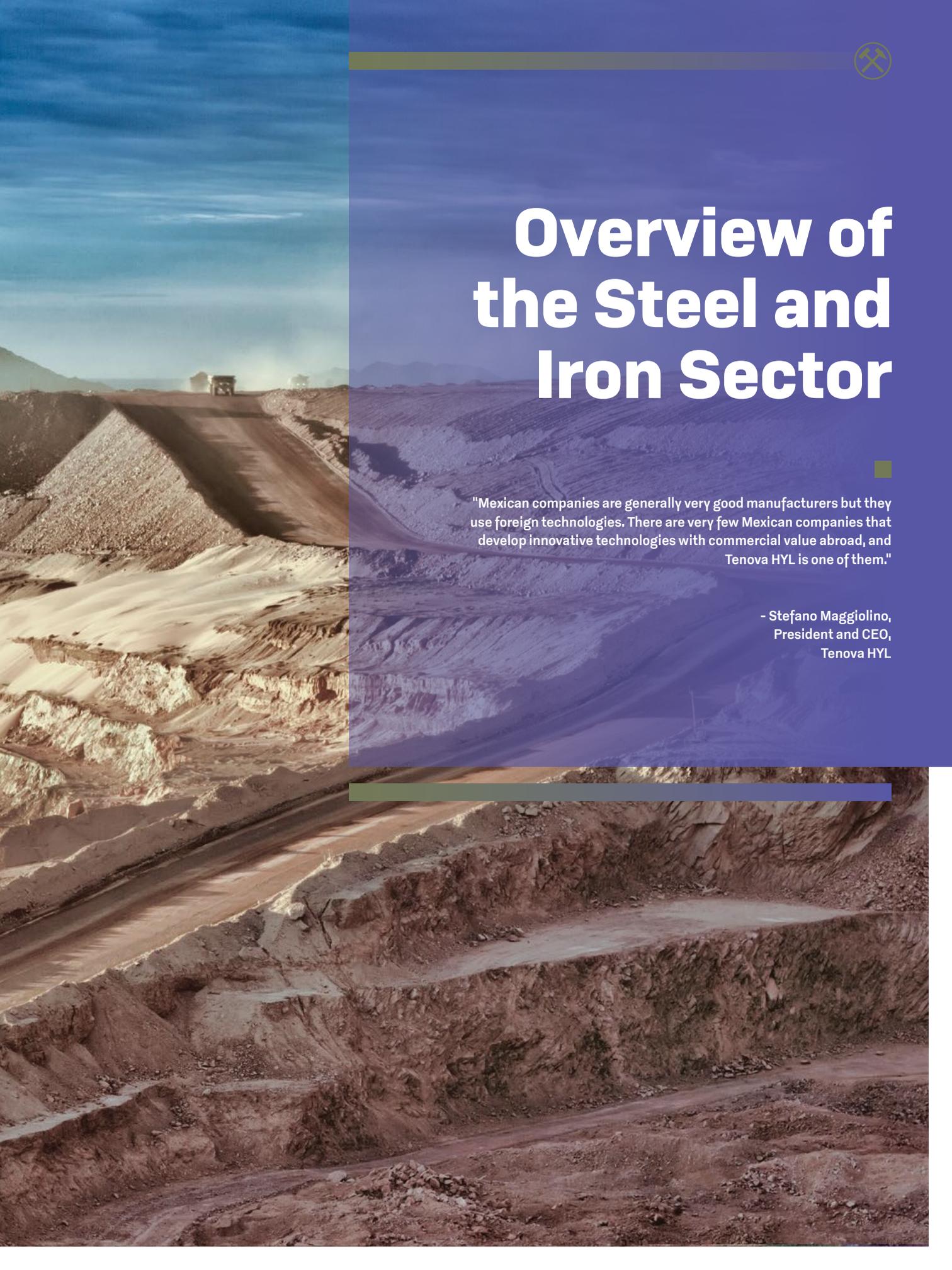




Overview of the Steel and Iron Sector

"Mexican companies are generally very good manufacturers but they use foreign technologies. There are very few Mexican companies that develop innovative technologies with commercial value abroad, and Tenova HYL is one of them."

- Stefano Maggiolino,
President and CEO,
Tenova HYL



A Vote of Confidence in Mexico

Mexico's steel sector is seeing large investments by the likes of Ternium and ArcelorMittal and is moving up the value chain, driven by a booming automotive sector.

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At 13:14 on September 19th, 2017, a 7.1 magnitude earthquake struck central Mexico, leading to the death of 370 people, as well as widespread property damage. In a harsh episode of coincidence, the earthquake occurred on the anniversary of the even deadlier 1985 earthquake. Twelve days prior to the central Mexico earthquake, another earthquake off the coast of Chiapas in southern Mexico, the second strongest in Mexico's history, left 98 dead. Alongside acts of nature, Mexico has been hammered by political tremors in its neighbor to the north. The United States is driving a hard bargain in the NAFTA renegotiations, which have become a priority since President Trump came to office in January 2017. This has made investors wary and has led to gyrations in the Mexican peso, which in turn has negatively affected the performance of some Mexican steel companies.

Despite these rumblings, Mexico's economy is relatively resilient, and prospects for its steel industry are positive. Since coming to power in late-2012, President Peña Nieto's administration has introduced a highly ambitious reform program, including liberalization of the energy sector and

significant changes to financial markets, labor environment and education. Whilst the IMF expects growth of 1.9% in 2018 — and the Mexican government predicts between 2-3% — Mexico is performing better than its major Latin American peers, and its manufacturing industry, especially its automotive sector, is booming.

Reflecting its relatively strong performance, Mexico is expected to consume 27.6Mt of steel in 2018, compared to 19.7Mt in Brazil, its regional rival. “We have shown that we have macroeconomics under control. All recent finance ministers have had a clear vision about working with macroeconomics, which has given certainty to investors,” remarked J. Rogelio Garza Garza, undersecretary of Industry and Commerce, Ministry of Economy of Mexico.

Investment Boost, High Value-Added Steel

Mexico produced 14.1Mt from January to September 2017, representing 36% of Latin America's production, closely behind Brazil, which produced 16.6Mt (42% of total output). Growth in production is positive:

Mexico's steel production is set to grow 7.5% in 2017. In addition, ArcelorMittal, the world's largest steel producer, and Ternium, Latin America's leading flat steel producer, announced combined investments of US\$2.1 billion in the country, which will further push up production.

Ternium plans to install a new state-of-the-art hot rolling mill with a production capacity of 3.7Mt/y at its Pesquería industrial center in the northern state of Nuevo León. Its US\$1.1 billion investment represents a significant technological upgrade to Mexico's steel capacity. The investment will expand Ternium's product range to include the most advanced steel grades and is aimed at replacing high value-added steel imports with domestic production. The new line will be operational by the second half of 2020, and the investment plan includes an option to further increase production capacity by an additional 1.1Mt/y. “Mexico imports approximately 3.7Mt/y of steel products. Following this trend, Ternium's investment will create an industrial pole in Pesquería, Nuevo León, and will replace approximately 2Mt/y of products imported to Mexico,” commented Juan Carlos Rodrigues Goncalves, president of

the Association of Iron and Steel Technology (AIST)’s Mexico Chapter and plant manager at Ternium Mexico.

The new mill will integrate Ternium’s upstream operations in Brazil, which it obtained after its acquisition of steel mill CSA from ThyssenKrupp for US\$1.3 billion, along with its downstream operations in Mexico. It will allow Ternium to produce technologically advanced products for the demanding industries in Mexico, such as the automotive, home appliances, machinery, energy, and construction sectors.

Likewise, ArcelorMittal is making a US\$1 billion investment over three years focused on building downstream capabilities, improving the competitiveness of its mining operations, modernizing its asset base, meeting expected increased domestic demand and realizing its production capacity of 5.3Mt/y. The company will construct a new hot strip mill and enhance its proportion of high value-added products serving domestic, non-auto, and general industry customers. “The investments will help us to meet the demand requirements for higher value-added products we expect to see from domestic customers, which today are heavily dependent on imports,” remarked Victor Cairo, CEO, ArcelorMittal Mexico. The investment is a significant boost to the local economy of Lázaro Cárdenas in the southern state of Michoacán, the primary base for ArcelorMittal’s steelmaking operations. Lázaro Cárdenas was named as one of Mexico’s five Special Economic Zones (SEZs) in southern Mexico as part of a policy introduced by President Peña Nieto in September 2017 to attract infrastructure investments into poorer areas of the country.

The ‘Big Four’

Steel production in Mexico is dominated by ArcelorMittal, Altos Hornos de México (AHMSA), Ternium and Deacero. ArcelorMittal is the leading supplier of steel products globally in all major markets, including automotive, construction, household appliances and packaging. It operates six

facilities in Mexico, employs more than 6,000 people, and is the largest employer in Michoacán. Globally and within Mexico, ArcelorMittal is an integrated producer, operating the Las Truchas mine and the Consorcio Minero Benito Juarez Peña Colorado in a joint venture with Ternium, which holds the most important iron ore deposits in the country and supplies 30% of the steel industry’s needs.

In Lázaro Cárdenas, ArcelorMittal produces slabs of different grades and has a capacity of 4Mt/y of liquid steel from four electric arc furnaces. In the same location, it also produces long products, rod, and wire for the construction industry, and its blast furnace has the capacity to produce 2.4Mt/y of steel. The company also produces rods of different grades at its two mills in the

central city of Celaya, with billets sent for production by rail from Lázaro Cárdenas. To serve the country’s mighty automotive sector, ArcelorMittal produces tailored blanks at its San Luis Potosí facility, as well as pipes at its two tube mills in Monterrey. Ternium vies with AHMSA for being the largest producer of steel in Mexico, with production at around 5Mt/y. It produces bars, billets, hot and cold-rolled steel, coils, sheets, slabs, wire rod, sections, pipes and tubes, and galvanized steel. It is part of the Italian-Argentine conglomerate Techint Group and has facilities in Nuevo León, Puebla, Coahuila, Jalisco, Colima, Michoacán, and San Luis Potosí, as well as in the United States, Guatemala, Colombia, and Argentina. 66% of its total shipments originate from Mexico. In late 2016, the Central

STEEL PRODUCTION BY STATE



ESTADO	%	ESTADO	%
1. Coahuila	29.5	7. Puebla	3.5
2. Michoacan	17.1	8. Mexico	4.5
3. Nuevo Leon	15.2	9. Tlaxcala	2.3
4. Guanajato	11.4	10. Jalisco	1.9
5. Veracruz	8.2	11. Baja California Norte	1.4
6. San Luis Potosi	5.0		

Eléctrica Pesquería, a 900 MW combined cycle gas power plant in Monterrey, was inaugurated. The plant is 48% owned by Ternium, 30% by Tecpetrol, and 22% by Tenaris. Ternium is able to purchase up to 78% of the power output, reflecting its desire to have more control over the natural resources it uses.

Unlike ArcelorMittal and Ternium, AHMSA's roots are in Mexico. It operates the largest integrated steel plant in the country, located in Monclova in the northern state of Coahuila, and owns iron ore and coal mines in close proximity to its plant. It is a national leader in hot-rolled coil, wide plate, cold-rolled coil, and tin-free steel. The company has experienced distinct peaks and troughs in its long history. It was forced to file for bankruptcy protection on US\$1.86 billion of debt in 1999 but, in April 2016, successfully exited the bankruptcy process after a court approved exit proposal for AHMSA to repay US\$1.7 billion over three years.

Indeed, things are looking up for AHMSA. It achieved record production of 4.65Mt of crude steel in 2016, a result, the company said, of its 'Fenix Project,' which focused on maximizing installed capacity and generating a greater variety of value-added steels. With the company now out of the bankruptcy process, it has a more solid base to focus on strategic ventures, such as expanding its op-

erations and strengthening its offerings in the automotive, energy, and specialized markets.

Privately owned and 100% Mexican manufacturer Deacero produces around 2.5Mt/y of steel. It began in the 1950s as a producer of steel mesh fencing but became increasingly competitive in the production of mesh and other wire. Today, the company has its own scrap metal collection and processing infrastructure, steel mills, manufacturing plants, and distribution centers across Mexico and the United States. Recently, the company has been targeting the automotive sector. In September 2016, Deacero announced it was investing US\$300 million to introduce new products for the automotive market. Then, in November 2017, it announced a joint venture with Japanese producer Summit Steel Corporation to establish a facility in Nuevo León that will supply wire rod for the automotive industry.

Moving Up a Gear

What is striking about the big four producers is that they are all making significant investments, in particular into producing higher value-added steel. "The iron and steel industry in Mexico has a big chance to grow. Despite every threat that shows up, like the ongoing renegotiation of NAFTA or the threat of foreign products, the Mexican industry has shown strength in its resources and capabilities and it has increased production and investments," remarked Juan Carlos Rodrigues.

There are signs competition is heating up in the flat products market, with the three main players in this segment, ArcelorMittal, AHMSA, and Ternium, all producing hot-rolled steel. "AHMSA has set up a steckel mill so that they can produce coils up to 96 inches wide. ArcelorMittal will produce coils up to 80 inches wide and Ternium, with its new investment, will produce 84 inch wide coils. This will fundamentally change the steel sector. It is going to be a blood battle," predicted Francisco Pontón, director general of service center Steel Warehouse Mexico.

Just as competition is becoming more intense and producers are moving up the value-chain, technology is becoming more sophisticated as companies adopt Industry 4.0. "Mexico is getting there but it is not ahead of the game. There are some Mexican steel companies that are quite advanced, such as Ternium, especially when it comes to digitalization," commented Leopoldo Cedillo, CEO of Metalsa, a structural component manufacturer for the automotive industry.

The steel industry has traditionally been conservative regarding change and Mexico is no exception. However, as Mexico's steel industry moves to prioritizing quality over mass production, the adaptation of new technologies will only become more important. As Karl Purkarthofer, senior vice president of plant equipment provider Primetals Technologies remarked, "Industry 4.0 is the biggest technological challenge but also opportunity facing the steel industry." ■

TENOVA DRI: INNOVATION, RELIABILITY, SAFETY AND SUSTAINABILITY



Ternium 4M Plant in Monterrey México

With proven **reliable** performance, thanks to the ENERGIRON Technology, TenovaHYL offers the most **innovative, sustainable and safest** solutions for the Direct Reduction of Iron Ore (DRI), together with the experience of more than 20 years and over 33 million tons of premium quality High-Carbon DRI produced.

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GFR: Head of Metallurgical Services USA
and Global Downstream Services
PRIMETALS TECHNOLOGIES



KP



GFR

Primetals started as a JV between Mitsubishi and Siemens in 2015. What were the reasons behind its foundation?

KP: The JV was a combining of two strong complementary forces to form a leading technology and service provider to metals producers. Siemens in recent years has changed its strategy to focus less on the metals business, so it entered into a JV with Mitsubishi who owns the majority of the shares. It was a great opportunity because Siemens VAI has traditionally been stronger in upstream technologies, automation and services, whilst Mitsubishi has much experience in downstream rolling technologies, manufacturing and a strong presence in Asia. So it was a perfect merger of two companies and fits very well with our vision to always be a leader in technology and innovation. Services for the iron and steel industry are becoming more important and we want to be a long term partner for steel producers with the goal to make them more competitive.

What is the extent of Primetals presence in the Americas?

GFR: Our service offering is very developed in the Americas and is represented by about 1,200 service specialists located in this region. In North America, we have a total of eleven locations where we provide services in close proximity to our customers. Three of these are focused on downstream, rolling mill services and the rest are upstream related, including the one in Monterrey, Mexico, where we currently manufacture service products.

How competitive is the market for the services you provide in Mexico?

GFR: On the service side, we are much stronger than any of our competitors in North America. We have a direct local presence in Mexico including our own manufacturing, compared to our competitors who typically work through business partners.

How is Primetals embracing Industry 4.0?

KP: As a technology provider we also have deep process knowledge and strong capabilities in automation, process modelling, mechatronics and robotics applications. Primetals develops models to optimize plant performance across different stages of the production process and also to improve maintenance and asset management. In addition, we are working on further develop-

ing our eService portfolio through the use of different new technology fields such as augmented reality, 3D printing or virtual market places so that our clients will be able to more easily connect with us and better maintain their equipment. What is crucial in these fields is that companies like Primetals have domain knowledge; while other companies offering solutions in Industry 4.0 can provide technology or infrastructure but lack specific process and application know how. We can offer both.

Can you talk more specifically about your maintenance services?

GFR: We can offer services from online or offline maintenance services for any plant to refurbishment of key components or condition monitoring. We are also working on remote diagnosis of equipment. We can receive analysis of vibration monitoring from steel mills around the world and determine exactly what is wrong with the equipment. We are very advanced in predictive maintenance and can alert customers months beforehand about a problem.

How does Primetals work with universities and research centers?

KP: We have an open innovation approach and work with over 50 universities and research partners globally. Traditionally, our technology base has been mostly in Europe and Japan so we have more partnerships there. We are also working intensively with start-ups, in particular on Industry 4.0 applications. This collaboration model helps us to keep up with the speed of technological change.

How important is Mexico to Primetals wider business?

KP: Mexico is a focus market for us. We have been committed to the country for more than two decades and we see a lot of opportunity for both new plants and services. Therefore, we are investing in our location in Monterrey to grow our service capabilities in the country. Service is a local business as you need to be working closely with the customer every day. With these future investments we will widen our service portfolio in Mexico. Most of our major customers have moved very rapidly from prioritizing mass production to quality. For this they need a partner who can provide leading technology and also related high quality services locally. Primetals can be that partner. ■



Guillermo González Jiménez

CEO
PRIMETALS TECHNOLOGIES
MEXICO

What are Primetals Technologies' main focuses in Mexico, and how important is Mexico to the company's overall portfolio?

Primetals Technologies' main focus in Mexico was electric arc furnaces, today we take care of the full PT Portfolio, and the main focus is metal services. The company's electric arc furnace facilities date back to Fuchs, which was acquired by Siemens, who then created Primetals Technologies through a joint venture with Mitsubishi Heavy Industries in 2015. In electric arc furnaces, ladle furnaces, and steelmaking spare parts, the Mexico facilities fabricate core components for this type of equipment, including electrode arms, blowers, burners and complete upgrades for electric arc furnaces and ladle furnaces.

How has the Primetals Technologies joint venture helped boost your pre-existing business?

Since becoming Primetals Technologies, we have been the company's center of excellence for electric arc furnace production and metals services, including equipment lifecycle management and casting services. The company has been quite successful with slab and mold-ing casting services in the United States and Brazil, and we will soon be servicing a major casting steel plant in Mexico. We also plan to invest in a new workshop that will service hot and cold rolling mills. The Primetals Technologies joint venture has been very important for our growth, as our direct sales increased by 60% in 2015 and 90% in 2016. Our customers are mainly located in the US, Mexico, and across South America.

Have you noticed a transition away from electric arc furnaces in any of the markets you serve?

In Mexico, electric arc furnaces are still the most popular technology. Only AMHSA and ArcelorMittal Lazaro Cardenas, use basic oxygen furnaces. Electric arc furnaces are still the most popular technology in the United States as well, but the basic oxygen furnaces route, and direct reduction iron, are becoming more popular there to produce higher grades of steel. Primetals Technologies produces basic oxygen furnaces, but in Mexico we only produce spare parts and cooling mechanisms for this equipment. Our center of competence for this is in Linz, Austria, as well as for the Ruhrstahl Heraeus process (RD) and vacuum degassing VOD/VD.

How do you expect to be competitive in the new markets you are entering?

The new markets we are entering are competitive, but we have identified common challenges that do not apply to us. For example, we will be competitive in the rolling mills components market because most component suppliers are far from their customers and spend a significant

amount of capital on transportation. Being far away from customers also creates problems with delivery times. We will also compete with our local competitors because customers typically prefer to buy directly from OEMs than from third parties, as long as OEM is competitive in price.

What are Primetals Technologies main competitive advantages?

Our main competitive advantage is our manpower and productivity, which helps us keep our costs down, as well as expertise in metals services. We are also physically very close to our customers which usually makes us the first choice for repairs or consulting services, also we have a sales and service force that are continuously in front of our customers.

How have the NAFTA renegotiations affected Primetals Technologies' business in Mexico?

At first, our clientele across all industries was hesitant to make any investments. After the first shock, however, it seems everyone is moving forward as usual. Mexico has a very strong manufacturing base and is extremely well located globally. We also have very open trade agreements that we can rely on as a backup plan in case anything unexpected happens with NAFTA. Also, no matter what, we will find ways to be competitive and continue servicing the US market.

What is Primetals Technologies' growth strategy in Mexico over the next several years?

Our goal over the next few years is to ramp up to doubling our capacity. Even more importantly, we want to provide a more complete portfolio of products and services to our customers. This is why we are increasing our efforts in casting services and investing in a rolling mill components workshop. We want our customers' equipment and parts to be ready exactly when they need to be ready and we want to be the preferred and favorite supplier for the steel industry. ■



Stefano Maggiolino

President and CEO
TENOVA HYL

Could you give an overview of Tenova HYL's history in Mexico?

Mexican companies are generally very good manufacturers but they use foreign technologies. There are very few Mexican companies that develop innovative technologies with commercial value abroad, and Tenova HYL is one of them. We are very proud to export Mexican intellectual property around the world. HYL is a pioneer of direct induced iron (DRI) reduction. In the 1950s, when there was a shortage of scrap metal in North America, HYL invented a way to produce pure iron from iron ore and natural gas. Before its acquisition by the Techint Group in 2005, HYL was the research and development arm of HYLSA. HYL was then placed under the Tenova umbrella, maintaining a strong relationship with Ternium and sharing the same facilities in Monterrey.

Since 2005, we have retained approximately 50% of the DRI market. In addition to our plants in Mexico, we also have three plants in the UAE, two in Egypt, one in South East Asia, and one in Louisiana, United States, among others. Tenova HYL and Danieli now develop the technology under the Energiron strategic alliance. We benefit also from the synergies within Tenova, a Techint Group company.

What is Tenova HYL's strategy to maintain a consistent growth rate moving forward?

Tenova HYL has a four-pillar business strategy, including innovation, reliability, sustainability, and safety. In terms of innovation, we are currently in the engineering phase for new plants where we will leverage our technology to produce novel products. For example, we have a very specific process to produce high-carbon DRI, and we are now moving toward high-carbon briquette production. In terms of reliability, our plants are in great condition. To enhance our reliability further, we are investing in the Industry 4.0 model and integrating technology such as advanced sensors and Big Data analytics through Microsoft's Azure cloud.

In terms of sustainability, Tenova HYL provides the only DRI technology with a CO₂ absorption system. For most companies, excess CO₂ is an issue. For us, it is a source of revenue. For example, we sell our CO₂ byproduct to oil companies in the UAE who use it for enhanced oil recovery,

as well as beverage companies in Mexico who use it for soda.

Do you foresee an increase in DRI demand from the Mexican market?

Mexico alone would be too small as a market for us, and it has always been Tenova HYL's intention to sell its technology abroad. That said, we have noticed a recent uptick in demand in Mexico driven by an influx in downstream investment, including rolling mills and finishing lines, for example. However, these lines must be fed, and importing slabs of metal is not always the most convenient way. Perhaps not in the short-term, but eventually we expect an increase in DRI installed capacity in Mexico. We are currently considering revamping our larger plants in Mexico that serve Ternium and ArcelorMittal.

How competitive is the DRI market?

DRI is a growing trend in the steelmaking business. It is not as widespread as blast furnaces, but it is growing at a much faster rate. There are far more drivers for the increased capacity of DRI, while blast furnaces will eventually become obsolete. The DRI process is much better than converting scrap in terms of quality because scrap always involves impurities in the metal. For industries requiring high-quality metal, like the aerospace industry, for example, DRI is the best method because the results are purer. DRI also produces less CO₂ than blast furnaces, so it is inherently better for the environment. With our CO₂ absorption system, we produce 50% less CO₂ than blast furnaces. When there will be direct access to hydrogen, that figure will increase to around 75%, and the process will be more cost-effective.

As a company based on innovation, from which government incentives have you benefitted in Mexico?

In many cases, we have developed new technologies through funding by the Mexican government's Consejo Nacional de Ciencia y Tecnología (CONACYT). We have also benefitted from partnerships with major universities in Monterrey, including Tecnológico de Monterrey, Universidad de Nuevo León, and Universidad de Monterrey. In these partnerships, we provide scholarships and training, which is very helpful for recruiting skilled engineers once they graduate. ■



David Decker

Vice President NAFTA
ABP INDUCTION SYSTEMS

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Could you please give an introduction to ABP's presence in Mexico?

ABP Induction is one of the leading suppliers for the induction melting and heating markets, including coreless induction furnaces, automatic pouring equipment, holding equipment, and mass heating equipment. Traditionally, we have been very successful in the Mexican market, particularly within the automotive industry. ABP provides value to our Mexican customers through our existing entity located in Santa Catarina. This entity provides sales and after-market services, including spare parts, field service, preventive maintenance, and induction repairs. Our local entity in Mexico supports our Mexican customers, providing services on-demand and maximizing uptime and ultimately their profits.

What have been ABP's most significant growth drivers in Mexico over recent years?

ABP's melting and heating business has been largely driven by the automotive industry not only in Mexico, but throughout North America. Typically, about 60% of our business pertains to the automotive industry. The majority of our business within the metal casting market includes a wide range of melting furnace configurations from 2 mt to 65 mt capacity. Many of our customers' requirements have evolved into more of a high-performance application, so the high-powered, fast melting, high-efficiency "batch melt" furnace configuration has also been a significant internal growth driver. Recent accomplishments include an installation of six 65 mt, 45 MW induction furnaces which are the most powerful in the world.

What are the benefits of using induction furnaces over electric arc furnaces?

The benefits for using induction furnaces include more precise temperature control and reliable chemical homogeneity provided by the electromagnetic stirring, resulting in a well-controlled melting process. With an induction furnace, you can hold a precise temperature and stir in alloying materials near the end of a melt cycle to arrive at the correct chemistry. Electric arc furnace users do not have the same level of control. A major benefit for specialty steel producers is the conservation of costly alloys and reduced slag generation. For example the 45 MW induction furnaces we recently installed are used for melting ferrochrome, and due to reduced burning of costly chromium, the customer is saving approximately US\$250 million per year in their very high volume plant. Steel mills, still favor electric arc furnaces for high volume melting capacities with ordinary steel production and will utilize induction furnaces as a supplement.

What effect have the NAFTA renegotiations had on ABP's business?

Several of our clients held off on making any critical decisions for about the first six

months after the new US administration took over. After being at a standstill from January to July 2017, companies restarted their growth strategies. Despite the slow start, 2017 has been a record year for our systems sales. From a macroeconomic perspective, Mexico is strongly opposed to any taxes on products being imported to the US. On the other hand, the US auto industry relies heavily on auto parts from Mexico for its factories in Detroit. The two economies are so interconnected that there is a lot at stake.

What is ABP's innovation strategy?

From an environmental perspective, ABP has recently developed a new exhaust hood design called EcoTop, which improves the capturing of emissions. We are also focusing on improving processes through automation. High power density installations work most efficiently when their operation is coordinated through automation. To achieve this, we provide automation for all aspects of the plant, from the charging car to the furnace to ladle treatment and automatic pouring.

How does ABP promote safety in the workplace?

ABP has developed and patented a variety of innovative safety features within our control systems. Bath grounding, the prerequisite for a functioning electrical safety system, is supervised and logged electronically, not by a potentially tired or distracted human operator.

Do you have a final message for our readership?

We are very encouraged with the amount of activity and investments within the NAFTA market. We have seen revitalization within the US castings market, including capital investments for new manufacturing facilities. In Mexico, additional manufacturing investments are already underway with several pending active projects. Demand will continue to rise, and the Mexican market will be a major player in the global castings market. ■



José Ignacio Lobo

General Director

ROBERTS SINTO DE MEXICO

What are Roberts Sinto de Mexico's core competencies?

We view ourselves as a link between our parent company, Roberts Sinto, and the customers we supply with their equipment. A large share of our customers are in iron and non-ferrous foundries, and we supply them with machinery, spare parts, and aftermarket services. The main equipment we supply in Mexico includes molding machines, core machines, grinding machines, automatic pouring machines, and material handling systems. We also focus on surface treatment, which includes blast cleaning machines and peening services, which is a stress relief process.

What is Roberts Sinto's most innovative product right now?

We have a model of sand molding machine called the FDNX, which is made in Japan and uses aeration sand filling technology to produce castings. For many of the small foundries in Mexico who still produce castings manually, this machine is the first step toward automation. Foundries used to be very labor-intensive, but now they are moving more and more toward automation. Automation technology is much more common in large foundries, but the technology is gradually making its way into smaller foundries, as well.

Roberts Sinto also owns Sys-T-Mation, an American company that sells assembly line conveyors for the automotive industry. Sys-T-Mation's main customers in Mexico are American automotive manufacturers, and Roberts Sinto de Mexico supplies aftermarket services for these customers.

How significant is the foundry market in Mexico?

A few large players comprise the majority of the Mexican foundry market, including NovoCast, Blackhawk, and CIFUNSA, among others. The rest of the market is comprised of a significant number of small, often family-owned foundries that are more niche players and produce specific automotive or equipment parts. While an official foundry census unfortunately does not exist, it is estimated that there are around 1,500 foundries in Mexico.

What are Roberts Sinto's main competitive advantages in Mexico?

With the exception of melting furnaces, we supply equipment and machinery for the entire foundry process, so our customers only have to use one supplier. We also take care of the installation for each machine. Our installation and aftermarket services are a key aspect of our business and really set us apart from our competition. We have one service employee in Monterrey and three in Aguascalientes, and those three are from Sinto Japan because many of our Aguascalientes customers are Japanese

companies. Our Japanese customers are typically surface treatment customers.

From your perspective, what are the main macroeconomic drivers for Mexican cast iron foundries?

The growing automotive industry in Mexico is by far the main driver for our customers. Heavy agricultural machinery and construction equipment are also drivers, but the automotive industry easily accounts for more than 50% of the total demand. At the beginning of 2017, many large manufacturing and construction projects were put on hold because of the uncertainty of the NAFTA renegotiations, but as the year has gone on, we are seeing that the US-Mexico trade relationship is increasingly likely to continue as usual. In reality, the automotive industry is booming regardless of any country's trade policy.

What is Roberts Sinto's short-term growth strategy within Mexico?

Mexico is an important market for Roberts Sinto and our presence here gives our customers confidence that they will always have access to our services. Our goal is to continue developing the relationships we have with our existing customers and be involved with their new projects, as well as to add more customers. We also plan to start manufacturing certain parts and systems in Mexico, which will greatly reduce our freight costs. We have already begun the first steps and expect some manufacturing to begin in Mexico in 2018.

Do you have any partnerships with academic institutions?

I sit on the board of the Foundry Educational Foundation, which is associated with the American Foundry Society. The purpose of the foundation is to help graduate students get involved in the foundry industry, and we work very closely with Saltillo Tech. The board members are all heavily involved in the foundry industry. I am also the chairman of the American Foundry Society's northern Mexico chapter. ■



Dieter Femfert

Commercial Director
CRYOINFRA

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With Mexico's GDP growth averaging around 2% per year from 2014, how has the economy affected your business?

We supply gases to different sectors, so when we experienced a decrease in demand from the steel sector due to Chinese competition, we also witnessed strong growth from sectors like automotive, aerospace and mining. We also saw a decline of demand for nitrogen for oil fields due to a Pemex's reduction in perforation and exploration of new wells. Nevertheless, because of the growth sectors, our sales are 15% higher this year than last year.

Cryoinfra is the leading supplier of industrial gases in Mexico. What are the reasons for this?

Our main advantage is the location of our plants as we are the only company that

covers all of Mexico's territory. With more than 250 branches and filling stations, we can always provide on-time-delivery, technical support and maintenance to our customers. This is especially important given that it can be difficult to rely on road transport in Mexico. Our second advantage is our technology, especially for the steel industry. For example, we have patented technology for burners which helps them improve their production and efficiency.

How has your business with the steel sector performed in recent years?

The steel sector is growing again and we have renewed our supply agreements with Ternium in Apodaca and Puebla and will supply them with gases for their new project in Pesquería. We also supply Deacero in Celaya, helping them grow by using oxygen, hydrogen, nitrogen and argon. Furthermore, we have won a contract to supply 85 mt/d of oxygen to Grupo Simec for their new steel production plant in Rio Bravo, Tamaulipas. Here we have installed an oxygen generator with argon production. We have also renewed our agreement to supply them oxygen for their steel plant in San Luis Potosí. Lastly, we are constructing a new air separation plant in Torreón with a capacity of 300 mt/d of oxygen for Industrias Peñoles, a mining company, relevant for the steel industry.

Could you provide more details about Cryoinfra's engineering expertise?

We have been partners with Air Products & Chemicals since 1980, which owns 40% of Cryoinfra's stocks. In the past we received a lot of help from them, given that they are leaders in technology for burners and refining of steel, but over the years we have developed our own specialized teams working on applications for steel, mining, automotive, food and beverage, chemicals and petrochemicals and energy. These teams have developed patents of technology in Mexico to meet our client's needs. We now have a continuous interchange with Air Products on technology applications for the steel industry.

Have you noticed any impact yet from the energy reforms?

All of the reforms, especially the energy reforms, will help Mexico a lot but they are being implemented very slowly. The more time passes, the more competitiveness we will lose. The central government, Secretary of Energy and private companies must move faster. Because of the reforms, in February this year we inaugurated a 140 MW cogeneration plant, representing \$180 million worth of investment. This will provide more efficient, clean and competitive energy to Cryoinfra and our customers.

How do you see factors like reconstruction after the earthquakes, the special economic zones and the Mexico City New International Airport (NAICM) affecting the steel industry?

The best way to help the steel industry is internal consumption which should increase due to these factors. It is important that steel is produced in Mexico because if we buy from other countries the benefits to the country will not be as great. Obviously the steel industry must become more competitive but the duties on Chinese steel imports ensure there is a fair playing field. The earthquakes mean a lot of buildings and houses need to be built again, resulting in more demand for oxygen, nitrogen and argon. Cryoinfra has also done a good job of supplying oxygen to all the hospitals that needed it after the disaster.

What are you most proud of about Cryoinfra and what will be your main focus going forward?

Our main purpose is to deliver an excellent service and be closer to our customers. We want to maintain our leading position in terms of production and sales by focusing on quality, warranty of supply, technological expertise for applications, service and cost competitiveness. Most importantly, we want to achieve customer satisfaction. We are most proud that we have not just maintained our leading position but continuous growth in terms of sales and volumes. ■

Jorge Zambrano

CEO

ZIMMER RECYCLING

Could you please give a brief introduction to Zimmer Recycling?

Zimmer Recycling is a family-owned company based in Monterrey that was founded in 1980. We do both ferrous and non-ferrous recycling, but our scrap metal is 100% post-industrial. In other words, we do not buy scrap from the street or from dealers. In addition to Monterrey, we are located in Reynosa, Saltillo, San Luis Potosí, Hermosillo, Querétaro, and we will soon be located in Guanajuato. We are part of a group of companies that includes a plastics recycling company, a wood recycling company, and a real estate company. We own and operate our own trucks, and we provide an integral service solution, which means we provide labour and equipment in addition to scrap collection. We employ about 1,000 people, most of whom are located onsite with our customers, and we export scrap around the world. The automotive sector is our main business driver in terms of both sourcing and selling. The appliances and mining sectors are also important on the sourcing side, and then we sell to manufacturers. Our annual capacity is about 500,000 mt/y of steel scrap and nearly 60,000 mt/y of non-ferrous scrap.

What are the main challenges in the scrap recycling business?

One of the main challenges is compliance. The Mexican government has set a lot of hurdles for Mexican businesses in general, but particularly for recycling businesses. The main reason we do not collect street scrap is because of the tax implications and financial hurdles required to do so. From a broader perspective, the US tax reform, NAFTA renegotiations, and the Mexican presidential election could all have negative impacts on the recycling business. It is easy to sell our materials, but sourcing materials can be challenging. These macroeconomic factors could affect our industrial base and possibly limit our supply. We are being more cautious in terms of investments, but if none of these factors affect us, then we have an otherwise positive outlook on 2018 and beyond. We are deferring many of our capital expenditures until after these factors are better defined.

How much do you expect to benefit from infrastructural promises in both the US and Mexico?

Infrastructural projects will not have a significant affect on our sourcing, but they will help improve our consumer base. We sell scrap to companies that produce building and construction products. Even if we do not sell to specific infrastructure projects, an increase in these projects will increase demand in scrap, and as a result, prices will increase. Mexico has a scrap deficit, so there is already quite a bit of competition for domestic scrap metal.

What sets Zimmer apart from its post-industrial scrap competitors?

Zimmer is the largest post-industrial scrap company in Mexico. It is a very competitive space, and all companies involved must have IMMEX and VAT and excise tax certifications. Many competitors have their own fleets of trucks, but we provide the labour and equipment required to make the collection process as efficient as possible. We also have professionals with varying areas of expertise, as well as access to the best markets, which helps us keep the different types of metals separated. Many scrap collection companies, particularly those who collect from the street or from dealers, collect everything in one pile and mix the different types of metals together, whereas we sell or export specific types of metals to different companies or countries.

What is Zimmer's growth strategy over the next several years?

We are opening a new yard in Guanajuato in January because it is an epicenter for much of the growth in the automotive industry. We are also working on strengthening ties with our customers in Detroit, and we have an Ontario office that allows us to be closer to many of their plants. As long as the automotive sectors in the US and Mexico are booming, both the sourcing and selling sides of the equation are going well for us. We believe there is a lot more growth that could happen, as evidenced by Toyota's new plant in Guanajuato. Once the macroeconomic concerns subside, the automotive sector will have even more room for growth. ■

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Pedro Antonio Colchado Luna

General Director
ACEROS ROCO

Could you please give a brief introduction to Aceros Roco?

Aceros Roco is 47 years old. The company was founded by my father, and now my brother and I are managing the business. We used to only be a steel trader, but over time we were able to buy some machinery, and now we also do steel transformation, including cutting, molding, and shaping. We can also cut pieces on demand, so our client gets what they need. We are still distributing, but we do a lot more machine-working now since it generates more revenue. The competition is very strong in Mexico, which is why we have been changing and adapting our company. We also have the advantage of being very close to our clients, so we do our best to satisfy the client's expectations on delivery time and quality.

Which sectors are the your most significant business drivers?

The construction sector has shown the most demand. For example, there is a new commercial plaza being built in Puebla, and the construction company has made a series of designs for us. They asked us to make a rolled metal sheet to cover the columns in the

parking lots for protection. The construction sector is the most import for us because it requires a lot of products from us, particularly steel beams.

How difficult is it to get involved in a large project, such as the construction of the new Mexico City airport?

It is very difficult to get involved in the airport project. It is a major project, and those construction companies work directly with factories. Due to the earthquakes, we have been asked to participate in reconstruction, materials, and budgets by certain city councils. In Puebla there is an abandoned project that was a dry port that we supplied materials for, but the government donated it to the army.

How do you compete with low-cost materials from Asia?

There was a moment when low-cost Chinese products were everywhere, and it affected us significantly in terms of price. The government's anti-dumping measures were effective, though, so now we can compete with the Chinese companies. ■

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Emiliano Montoya

Director General
BRC GLOBAL ROLLS



Could you provide a brief introduction to the company?

We have been providing rolling mill rolls in Mexico, produced in China under the supervision of the most expert European manufacturers, since 2002. Our Mexican sales grew very fast, selling \$1 million worth of rolls in the first year, \$3 million in the second year and \$10 million in the third year. Since 2003 we have sold \$8 million to \$11 million rolls each year. We are leading the market and are focused on providing services, technical assistance and developing new grades. We were the first international company with European design and Chinese manufacturing to enter Mexico in this field with a strategy directed towards high technology specialized roll qualities and processes.

Latin America is the main market for BRC. We sell to producers for construction and seamless pipes for oil and gas. BRC was represented by Grupo Capsa until 2013, when BRC established its own office in Mexico.

What trends are you noticing in the end-markets you ultimately serve?

Mexico is still a developing country, so there is a lot of investment in construction, and a big demand for our products and services. Generally, the demand for larger pipes has decreased as Pemex has reduced its exploration and perforation activities but for our rolls which produce smaller pipes for gas, the consumption is increasing. With the fall in the oil price, Ternium, which produces seamless pipes around the world, decided to temporarily suspend production in a plant in Canada and reduce production in Italy, but increase production in Mexico due to the cheaper manufacturing costs. This year they decided to re-start the plant in Canada and increase production in Italy again.

All the rolling mills in Mexico are running at over 75% capacity. Therefore, we see no reduction in demand. In fact, the market is growing due to new investments into three new mills which are currently being built. The standard cost of rolling rolls for long products depending on the product being rolled is \$1 - \$4 per mt, and for billet to rebar it is about \$40 - \$60 per mt. ■

León Sametz



Director
TIM NOVAMETAL

What are TIM's main focus areas?

We are the most important factory in Mexico manufacturing stainless steel and nickel alloys, producing 10 billion pounds per year in a market of 20 billion pounds. TIM Novametal does not produce big bars, which is a market dominated by India. We compete in wires and also in some specialized bars. We make wires from 0.16 mm up to 30 mm and bars from 3 mm to 20 mm. For big diameters we import from Novametal locations in Brazil, South Africa, Switzerland, France and Germany. In addition, the steel we use to make our products is produced by a company in our group based in Italy. We provide good quality and quick deliveries.

At the moment we are targeting the automotive industry with good success, as well as the aerospace industry. These sectors need companies that have all the appropriate certificates, such as ISO/TS 161948, which we have. We also have all the specialized equipment to serve these markets. Our name is well known in Mexican industry and we export 50% of our production to countries such as United States, where we have a warehouse of 300,000 pounds providing just-in-time delivery, Costa Rica, Brazil, South Africa and Europe. We are also expanding in the Mexican market.

Why does TIM not focus on producing bigger bars and how does the company in Mexico differ to other ones in the group around the world?

Companies in India produce bars very cheaply and we cannot compete with this. We actually asked for some protection from the Mexican authorities but their policy is zero taxes and open borders. Each factory in our group has its own specialty. For example, in Mexico we produce fine wire whilst Brazil produces bigger diameters.

What are the main advantages and applications of your products?

Stainless steel is corrosion resistant, has high tensile strength and has an appealing appearance. We produce for springs, metallic forms, weldings, weaving for textiles and all applications where a round product with excellent corrosion resistance is needed. In addition, we sell to the construction market where strength and corrosion resistance is important, such as in bridges.

Automotive is increasingly using stainless steel and the aerospace industry does not use any carbon steel but uses aluminum and stainless steel. We supply Volkswagen directly and Chrysler indirectly through auto part suppliers. The aerospace began using very

simple stainless steel parts, such as in airplane seats but now they are demanding the material in more complex components which we supply. Very special alloyed stainless steels are used in engines as well, which we also produce.

How do you expect the NAFTA renegotiations to affect the Mexican steel industry?

Right now steel is not part of the NAFTA negotiations and there is no chapter in the current agreement. There are, however, for some of the application markets, such as automotive. We export to the United States without paying any taxes at the moment. The United States is demanding that 80% of the material used in automotive manufacturing comes from the NAFTA region and 50% from within the US market. This 80% target will be difficult to achieve because, for example, in some cases we import good quality materials from Italy rather than the United States which is more expensive. If the United States wants US steel to be used they need to decrease their prices but they will not do this. US stainless steel producers actually import wire rod to make bars.

What do you hope TIM will have achieved in three years' time?

If things stay the same, we hope to increase our sales by 5% to 10% every year. Also, we compete in the United States with Indian producers which have been subject to anti-dumping duties. Therefore, we hope to maintain our position and grow in the US market. Customers there prefer our product to Indian products. ■



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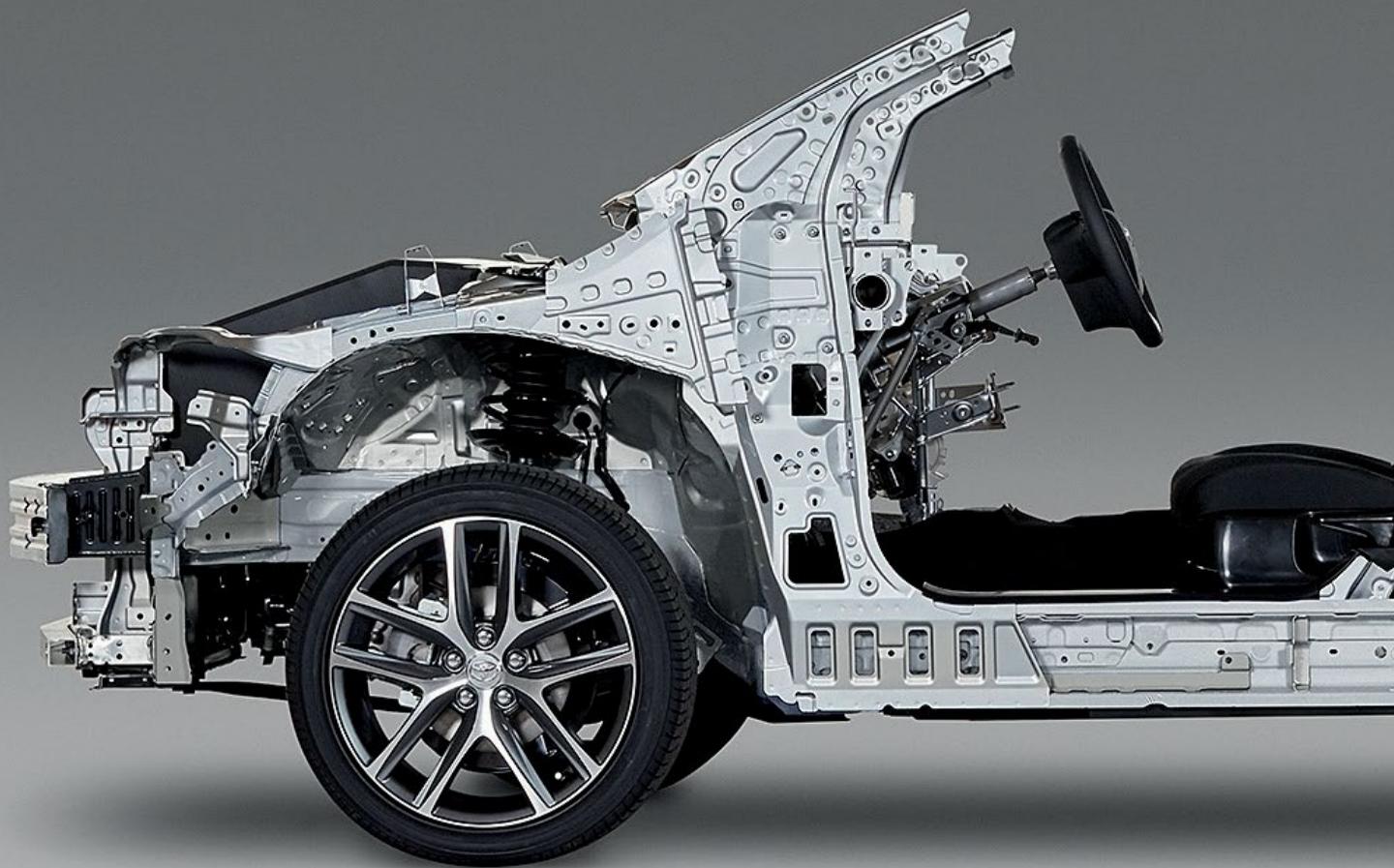
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Mexico's Automotive Industry

"OEMs cannot produce a competitively priced vehicle without using a low-cost country in its supply chain. For this reason, American and Canadian OEMs will likely continue to use Mexico for vehicle and auto parts production, regardless of the outcome of the NAFTA renegotiations. There is no other way."

- Oscar Albin,
President,
Industria Nacional de Autopartes (INA)

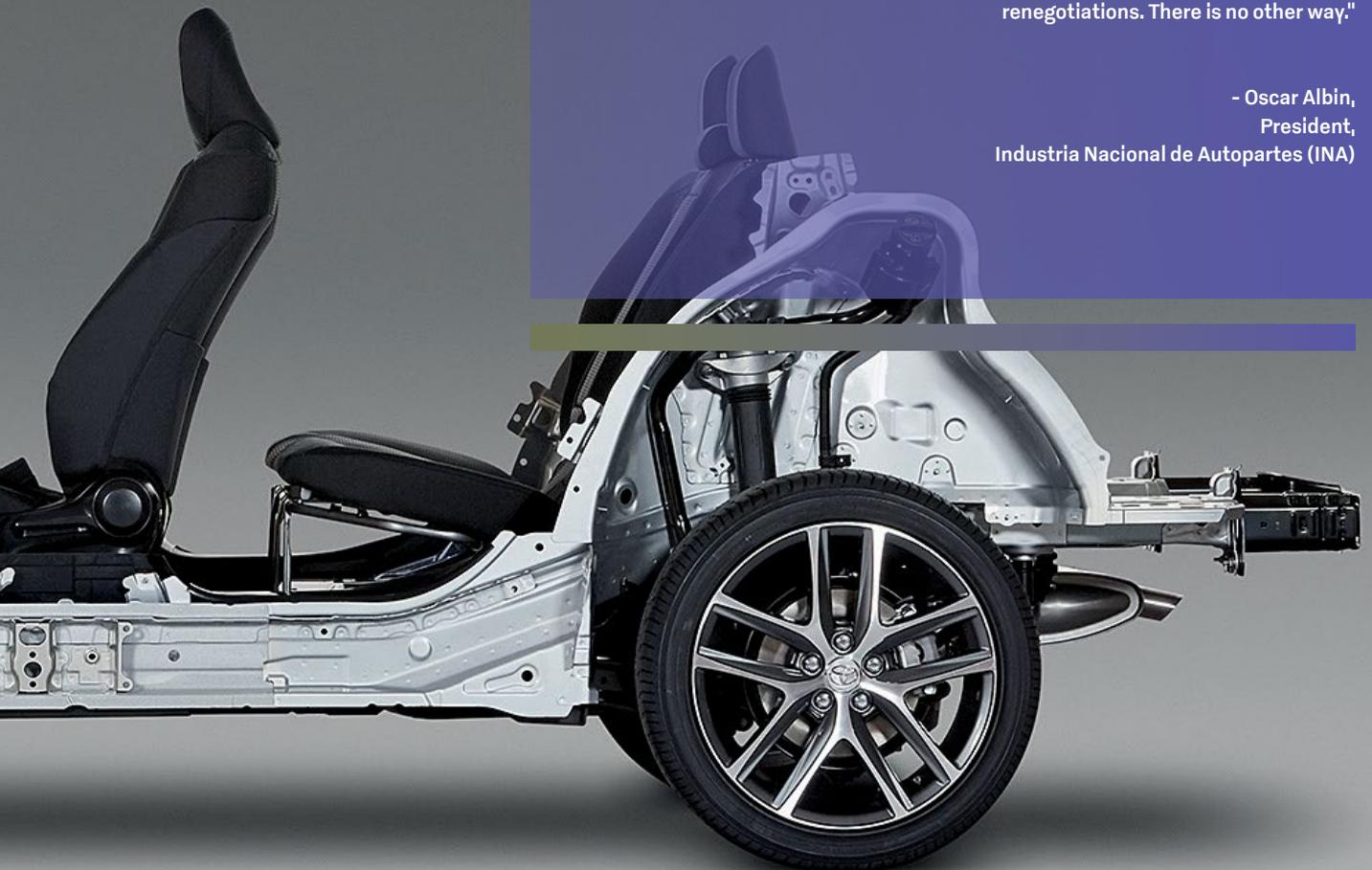


Image courtesy of ProMéxico

Key Drivers Driven by Driving

As Mexico's automotive industry thrives, Mexican foundries that supply it with steel castings are racing to keep up with demand and foreign steelmakers are eyeing opportunity.



Of all the macroeconomic factors impacting Mexico's steel and iron industry, the booming automotive industry is perhaps the most important catalyst. According to the Mexican Association of the Automotive Industry (AMIA), Mexico is the world's seventh largest vehicle producer and fourth largest vehicle exporter. In terms of total vehicles produced, the country yielded 3.6 million units in 2016, marking a 56% increase from 2010, and produced 1.9 million in the first half of 2017. When large steel and iron investments are made in Mexico, the automotive industry is frequently cited as a motive. According to Rogelio Garza Garza, Undersecretary of Industry and Commerce, Ministry of Economy of Mexico: "All of the steel that the automotive sector needs is premium steel. Ternium specializes in such steel and has a new plant next to KIA Motors' supplying its needs. When we help automotive, we are also helping the steel industry."

The Mexican automotive industry's success can be largely attributed to NAFTA. Since NAFTA's conception in 1994, Mexican automotive exports have grown at an 11% compound annual growth rate. According to AMIA, Mexico exported 2.7 million vehicles in 2016, equating to US\$55 billion in export revenue and 15% of the country's total exports. Mexico's top vehicle exporters in 2016 were General Motors (540,000 units), Nissan (500,000 units), Fiat-Chrysler (443,000 units), Ford Motor (377,000 units), and Volkswagen (334,000 units), and KIA recently began to produce cars in the

northern state of Nuevo León in May 2016. "In 2016, Nuevo León's automotive industry exported a bit more than US\$11 billion, and we are expecting to reach US\$12 billion in 2017," said Manuel Montoya Ortega, general director of the Automotive Cluster of Nuevo León (CLAUT). "Until 2014, the 100% of steel products for the exterior of cars was imported. Tenigal, a joint venture between Nippon Steel and Ternium, started to produce this kind of steel in 2014 and is reducing our dependency of imported steel for these purposes."

Hitting the Gas Pedal

The steel and iron industry most directly interacts with the automotive industry when metal castings are used for vehicle components. According to the National Industry of Auto Parts (INA), Mexico currently produces about US\$83 billion in auto parts per year, and the sector employs about 800,000 people. It also contributes US\$25 billion to Mexico's trade balance and comprises 10% of Mexico's manufacturing GDP. In this context, Ternium has cited the large automotive industry as the principle reason for its major investment into Mexico.

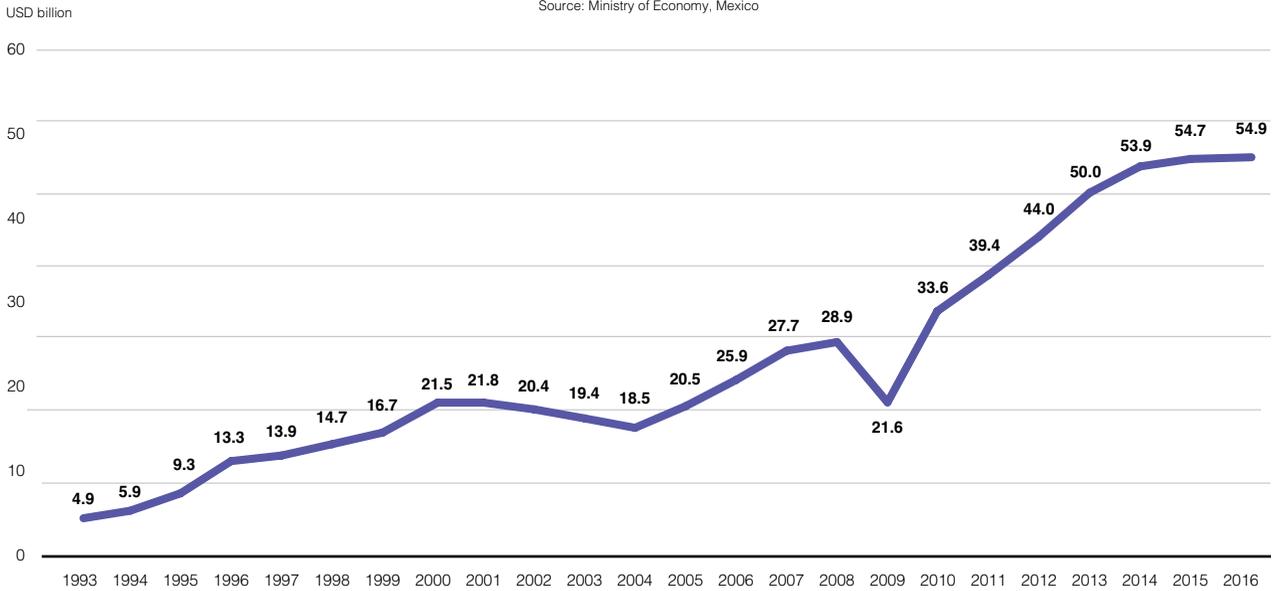
Of the 1500 auto parts factories in Mexico, about 30% are Mexican-owned. Due to the pace at which the automotive industry is growing, many Mexican foundries that supply steel and iron castings to auto parts manufacturers are finding it difficult to meet de-

mand. Foreign companies are seeing this as an opportunity. "Foundries from around the world are coming to Mexico to install capacity to supply the OEMs here. Additionally, we are seeing many Tier 1 automotive suppliers moving to Mexico from abroad and they are also using iron castings," said Patricio Gil, CEO of Blackhawk, one of the largest foundries in Mexico. "Even though our capacity has been growing, it is still not enough to meet the demands of the industry. In the past five years, there have been at least 26 new foundries in Mexico, most of which are foreign."

This issue is staunchly different from several years ago, when low-cost metals from Asia were undercutting fair market value of steel and iron in Mexico and posed a significant threat to local mills and foundries. To combat the threat, the Mexican government implemented several anti-dumping measures since 2015, most recently a duty set between 22.2% and 76.3% on flat coated steel from China. The government also launched a probe on imported steel plates from Italy and Japan in November 2017. According to Raúl López, general director of American Axel & Manufacturing's Monterrey-based casting division: "Until 2016, there was a problem with the availability of high-quality castings and there were a lot of cheap materials coming from China and Turkey, in particular. Now, most of Mexico's imported steel comes from the United States, and the price is linked to the American metal market indexes."

MEXICO'S MOTOR VEHICLES EXPORT

Source: Ministry of Economy, Mexico



Speed Bumps

Of Mexico's 3.6 million vehicles produced in 2016, 75% (2.7 million units) were exported. Furthermore, 90% of all auto parts produced in Mexico are destined for another country, whether directly or indirectly. The issue is that, compared to the rest of North America, there is very little domestic automotive demand, which limits the potential of the industry.

As it stands, domestic auto parts suppliers, many of which are family-owned, continue to struggle to meet the high demand of the automotive industry, whilst foreign automotive companies continue to bring their best suppliers with them from abroad. Thus,

it will be interesting to see how Mexican SMEs plan to maintain a significant piece of the pie and keep the investment capital within the country's borders. According to Manuel Montoya: "Nuevo León is certainly the most integrated when it comes to working with Mexican suppliers, but we still import about 60% of our supplies. That is much better than other states that are importing over 80% of their supplies, on average."

Echoing these concerns, Oscar Albin, president of INA, added: "The majority of Mexican auto parts suppliers are categorized as Tier 2 suppliers, and the foreign Tier 1 suppliers are the ones making large investments. The problem is that it is very difficult

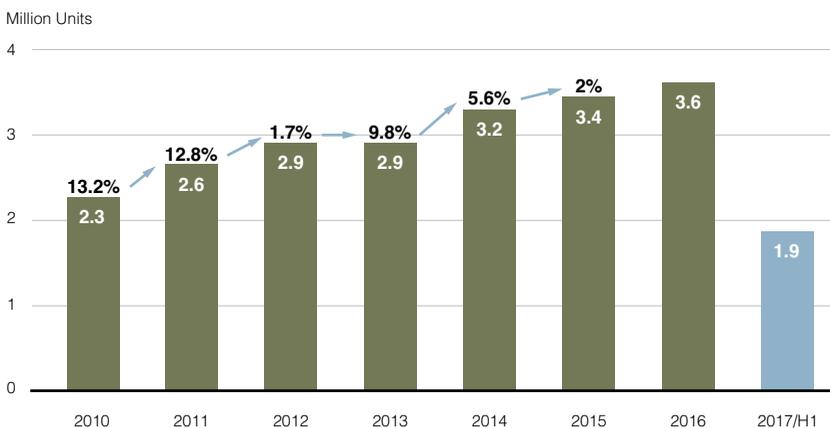
to convince Mexican investors to invest in the automotive sector because it is more of a long-term investment. Mexican investors tend to prefer high-volume investments with quick returns."

To keep up with demand, Mexican suppliers must adapt to the industry's imminent trend toward ultra-high-strength steels, which are used to produce lighter-weight vehicles without sacrificing performance. "Currently, there is a lack of such steel production in Mexico, but investments are being made as we speak, so shortly we will have more availability," said Mauricio Morales, general manager of service center Galvaprime.

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TOTAL PRODUCTION

Source: Ministry of Economy, Mexico



Down The Road

Fortunately, as OEMs continue to invest in the country, the growth rate of Mexico's automotive industry appears to be sustainable for at least the short-term. Echoing the industry's positive outlook on its future, Oscar Albin stated: "We expect to see the industry plateau around 4.5 million vehicles per year in 2020. BMW and Mercedes Benz recently built new plants in Mexico, Infiniti will complete construction of a plant by the end of 2017, and Toyota recently broke ground on their new plant. Mexico's automotive industry very much depends on demand from the rest of North America. As long as the American and Canadian economies are healthy, Mexico's auto-motive and auto parts industries will also be healthy." ■



Oscar Albin

President

**INDUSTRIA NACIONAL DE
AUTOPARTES (INA)**

To which factors do you attribute Mexico's recent automotive boom?

Within the past five years, Mexico has experience a boom in its automotive industry, which can be attributed to the many new greenfield investments by OEM and auto parts companies. Mexico is an important investment destination for the automotive industry primarily due to its strategic location in the world, its high volume of Tier 1 suppliers, and its free trade agreements, including NAFTA and the TPP. Mexico's automotive labor force is also highly skilled, and the quality of Mexico's auto parts are very high compared to the rest of the world. The auto parts sector is Mexico's largest sub-sector. The country currently produces about US\$83 billion in auto parts per year and employs about 800,000 people. Additionally, the auto parts sector contributes US\$25 billion to Mexico's trade balance and comprises 10% of Mexico's manufacturing GDP. There are nearly 1,500 auto parts factories in Mexico. 30% of these factories are Mexican, 20% are American, 20% are Japanese, 14% are German, and 10% are Canadian.

Are the NAFTA renegotiations actually a threat to Mexico's auto parts industry?

Auto parts production occurs in three main areas of the world: Southeast Asia services Asian OEMs, Eastern Europe services European OEMs, and Mexico services North American OEMs. OEMs cannot produce a competitively priced vehicle without using a low-cost country in its supply chain. For this reason, American and Canadian OEMs will likely continue to use Mexico for vehicle and auto parts production, regardless of the outcome of the NAFTA renegotiations. There is no other way.

As Tier 1 suppliers continue to make large investments in Mexico, how will SMEs maintain enough demand to stay in business?

This is an important issue because the majority of Mexican auto parts suppliers are categorized as Tier 2 suppliers, and the foreign Tier 1 suppliers are the ones making large investments. There are no foreign-owned factories in Mexico that would be considered second-class compared with its company's flagship factory. The problem is that it is very difficult to convince Mexican investors to invest in the automotive sector because it is more of a long-term invest-

ment. Mexican investors tend to prefer high-volume investments with quick returns.

Have you noticed an uptick in domestic automotive demand?

Mexican automotive demand continues to be relatively low. The NAFTA region as a whole produces about 17.5 million vehicles per year, but Mexican suppliers produce far more for American consumers than for Mexican consumers. The United States produces 12 million vehicles per year, while Mexico produces 3.5 million per year. The quality of the auto parts remains the same whether they are exported or not, but the reality is that General Motors United States, for example, produces more vehicles than General Motors Mexico, which is why 90% of auto parts made in Mexico are exported, whether directly or indirectly.

How would you characterize Mexico's environmental regulations?

The environmental standards in Mexico's automotive industry are quite strong and have been partly influenced by the international companies' standards. The Mexican government also recently introduced legislative targeting pollution levels in factories. The government and automotive industry work very closely on the environmental issue, so it is possible that the industry even exceeds other industries in Mexico in terms of standards.

How sustainable is the Mexican automotive industry's growth?

We expect to see the industry plateau around 4.5 million vehicles per year in 2020. BMW and Mercedes Benz recently built new plants in Mexico, Infinity will complete construction of a plant by the end of 2017, and Toyota recently broke ground on their new plant. Mexico's automotive industry very much depends on demand from the rest of North America. As long as the American and Canadian economies are healthy, Mexico's automotive and auto parts industries will also be healthy. The next challenge the industry has is seeing who will win the race to produce and supply components for electric vehicles. There are some heavy components that will be phased out within the next twenty to thirty years. Whichever country can develop the best technology to replace these components will likely get the majority of the production volume. ■



Manuel Montoya

General Director

**CLUSTER AUTOMOTRIZ DE
NUEVO LEÓN (CLAUT)**

What have been CLAUT's major updates over the past few years?

CLAUT has grown over the past few years, but most importantly the industry has grown because of the introduction of KIA to Nuevo León. KIA started to produce cars in Nuevo León in May 2016, and they have already produced 100,000 cars. This has moved the entire automotive economy of the state because KIA is starting to use more and more supplies and materials from Mexico, as well as importing from Asia. In 2014, 100% of the steel produced in Nuevo León was used for the exterior of cars, so luckily we have the experience to supply KIA with what it needs. We have exported almost US\$12 billion from Nuevo León in 2017, and that number will more than likely grow in 2018.

What is the approximate balance of imported suppliers versus Mexican suppliers?

Nuevo León is certainly the most integrated when it comes to working with Mexican suppliers, but we still import about 60% of our supplies. CLAUT's purpose is to develop more and better suppliers so that more content can be produced in Mexico and Nuevo León.

How is NAFTA renegotiation viewed within Nuevo León for the automotive industry?

Unfortunately, this is a threat for everyone, and not just the automotive industry. This will affect industries both in Canada and the US, as well. The US government is trying to impose certain duties that are not necessary and only apply to 3% to 5% of the products. A good percentage of our industry will continue regardless, but things will be more expensive because of the duties. In the end, cars will become more expensive, and we are going to lose competitiveness in the region. However, most production will stay in Mexico, as it would be far too expensive for the US to move the facilities and operations back to America. It is a potential threat that would hurt some competitiveness against other countries, but at the end of the day we will be able to face the potential new rules.

From your perspective, is the government's goal to cut emissions by 25% by 2030 realistic, and how will it affect the automotive industry?

This is a difficult goal and whether it is realistic or not, the government will force the companies to follow it. The companies would not work towards that target on their own. CLAUT has an energy consumption committee within the cluster and they are trying to find companies that can sell clean energy. There is a real opportunity for companies to consider making investments in renewable energy. Energy consumption is the most important means of reducing carbon production. There are other ways to reduce carbon production, but if you do not at least try with renewable energy, there is no way you will be able to comply with the government's new requirements.

What is your outlook for future domestic auto demand in Mexico?

Growth is hard to gauge at this point. However, CLAUT has seen that our Tier 2 companies have grown this year, and they are all selling a little more each year. Things are going on between our Tier 1s and Tier 2s, and we are starting to see openness within the markets and between the different tiers. Luckily, all of them are buying or selling.

Why is Nuevo León a top destination for International OEMs, and what are your expectations for the future of the automotive industry?

Nuevo León is an important destination for investors because of its productivity. We have more prepared people here in terms of engineers and technicians. We have wonderful universities, and people travel here specifically to study. The area attracts talented people and then they end up staying because of the quality of the projects. It is difficult to determine the future of the automotive industry in Mexico. The NAFTA negotiations are very important, but Mexico should continue to be very competitive despite the outcome. With these possible changes to NAFTA, I hope Mexico can see that we can open ourselves up to other potential markets that we have not yet pursued, like Australia or Vietnam. ■



Armando Mirandez

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Director of Strategic Projects
GRUPO QUIMMCO

Could you please give us a brief history on Grupo Quimmco?

Grupo Quimmco started in 1988 when the Barrera family bought DIRONA. In 1996, the family decided to pursue new ventures, like Forja de Monterrey, and continued to add businesses and ventures throughout the years. Our main business now is commercial vehicles, and we are strong in class six, seven, and eight trucks. We are expanding to the highway business to diversify our assets. Also, three years ago, we started to participate in the oil and gas and aerospace businesses. We have also seen major growth over the past several years from our castings companies, including Forja de Monterrey and Blackhawk.

What is next in Grupo Quimmco's innovation pipeline?

Grupo Quimmco has two major projects currently in development. First, we have been working a lot on process technologies, and we have had very good results. We have also developed some equipment for eliminating destruction for when you check production. We are very close to bringing customers on board this technology. Please add new announcements here.

What steps does Grupo Quimmco take to promote environmental sustainability?

Environmental sustainability is one of this company's top priorities. Many projects are geared toward reducing carbon emissions. We are starting a business that develops energy-saving and emission-reducing products, and we hope to announce the company very soon. Please add new announcements here.

What is Grupo Quimmco's overall growth strategy over the next several years?

Grupo Quimmco has been watching the NAFTA discussions, and we believe we will stay here longer than two or three years and continue to grow here. Our business is not only about cost, but also quality. Therefore, our results are far more important, and they have been great in Mexico. Our costs might not be as competitive as in other countries, but all of our customers are very happy with the quality of our work. I foresee us having many more opportunities for growth in the future.

What has been the most rewarding moment for you while at Grupo Quimmco?

When I transitioned from Sisamex to Grupo Quimmco, the founder of Quimmco shared a piece of advice with me that I will never forget. He told me there is a big difference between making money and making a future. In 2011, I completed my job at Sisamex and then moved over to Grupo Quimmco. I am very happy where I am now because I made a future. ■



Manuel Ortiz Monasterio Q.

Managing Partner,
Mexico and Central America
ERM

Could you give an overview of ERM's history in Mexico and services it provides to the manufacturing industry?

ERM Mexico has been in business since 1990 and started off delivering services for the manufacturing, chemical and pharmaceutical industries. At first a key driver was that corporates wanted to know more about environmental and social risks relating to potential investments. Then the environmental law of 1988 was introduced and after this it took some time for specific regulations and standards to be developed. ERM provides sustainability services covering environmental, health and safety, and social risks. We have moved with the times and now work a lot with the power and oil and gas sectors which are booming in Mexico.

ERM supports clients across the life cycle of their projects: design, site selection, permitting for new facilities, compliance and assurance, management systems, investi-

gation and remediation of contamination, and demolition of facilities. Specifically for manufacturing we have provided hundreds of transaction services projects (e.g. due diligence for facilities being bought or sold); we also provide a lot of compliance auditing, as well as management systems design and implementation. We analyze liabilities like soil and ground water contamination, and assist with the remediation of such liabilities. We have worked extensively for Tier 1, 2 and 3 automotive suppliers, including permitting work for car assembly plants.

Are environmental regulations less strict in Mexico compared to its North American neighbors?

Air emissions regulations do not compare favorably with those in the United States and Canada and Mexico needs a step-change to tighten these. However, other regulations, for example relating to waste and water, have been given more attention and are more in line with that of our North American counterparts

In spite of this, the government has worked to improve air quality, such as by removing leaded gasoline, emissions verifications for vehicles and tightening air quality standards (e.g. standards used to include just general particles but now they encompass PM10 and PM2.5).

How competitive is the market for ERM's services in Mexico and how does it differentiate itself?

The environmental consulting market is very competitive and diverse in nature. We are pure sustainability consultants but the market also includes large engineering firms that have consulting arms. Alongside these, there are also many medium-sized and smaller consultancies and individual consultants.

We have a long history in Mexico and strong reputation in the market both with industries and the authorities. Our main asset is our people; we have a strong and diverse team of over 80 employees in the country and an office in Panama which means we can respond quickly to the varied needs of our clients. Our staff includes biologists, lawyers and engineers of all types, anthropologist and sociologists. Furthermore, globally we have 4,500 consultants so if there are very specific client needs we can use their expertise and bring

them to Mexico. We have a global footprint, which means we can be a one-stop-shop for multi-country projects, providing homogenous services for all of their operations whilst also having expertise on local culture and regulations.

Why have regulations become stricter over time?

There are different pressures pushing in this direction. Civil society, which is now stronger with internet. There is also more pressure from financial investors wanting to manage their risks; for example, through the Equator Principles, which the commercial banking community has adopted to address social and environmental risks. There are other regional pressures: through NAFTA, Mexico has been expected to improve its standards. Lastly, there are international commitments made by the country; for example, during COP22, the country committed to reduce carbon emissions by 25% by 2030.

Is the 25% target achievable?

By 2030 Mexico should reach this target if we keep investing in renewable energies. Currently wind and solar energy has become financially viable moving past their break-even level, no longer reliant on support from the government. In this regard, the high oil prices in the past was very good for the world as it spurred investment into renewables, which led to cheaper technologies and more viable business models for energy from these sources.

Are you advising on the New International Airport for Mexico City and have you been involved in any other mega projects?

We are indirectly involved in this fundamental infrastructure project. Large infrastructure projects pose financial risks; however, there are other non-technical risks, such as environmental and social risks, that may be as important to address, if not more. More than half of new projects are delayed due to such risks so they are very important to consider.

We have been involved in many other large projects, such as Braskem Idesa's Etileno XXI petrochemical complex, advising on stakeholder engagement to obtain a social license to operate, which was key based on experience in the area with prior petrochemical plants. ■



AS

Adrian Salinas & Eduardo Martinez

AS: General Manager
EM: Senior Machine Designer
ATC AUTOMATION MEXICO

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Could you provide an introduction to ATC Automation's business in Mexico?

ATC has been in operation for over 40 years now and was originally established in Cookeville, Tennessee. We integrate engineering solutions to design and build assembly lines for our customers to automate their manufacturing processes. This ranges from a standalone process to a fully automated assembly line. ATC is the biggest company in the TASI Group which also has a strong focus on flow measuring and control and leak and testing solutions and has been growing through acquisitions. Over the last five to seven years, ATC in Cookeville has designed and built multiple machines for customers in Mexico.

This has reflected the growth opportunities in the automotive industry, as well as to a lesser extent in the medical industry.

With the strong growth in Mexico, ATC needed to place service personnel in the country to handle post-sale assistance. Then last year the company decided that the market was so attractive that they should establish formal operations in Mexico. Our facility will design and build machines for the Mexican market and eventually for Central and South America. We now have nine people in Mexico including designers on the mechanical and control side, as well as personnel that handle the assembly portion of the machines. They received training at our headquarters in Tennessee.

What are ATC's main target industries in Mexico?

AS: Initially we will mainly target the automotive sector, in particular Tier 1 suppliers. As we grow and gain more experience in Mexico we will target the medical market as well. We will do this only with Mexican resources; all our employees are Mexican, for example. We may eventually work with steel mills but as the automotive industry is growing tremendously with big investments from OEMs that will be our main focus.

How receptive are Mexican companies to automation technologies?

AS: It is getting a big push. One of the main drivers of automation are the increasing volumes which means even though labor is cheap in Mexico it does not make sense to employ an army of people on the assembly floor. As importantly, quality demands and traceability are also driving this trend.

EM: Traceability is very important as companies want to know from where exactly components came from after the final assembly of a vehicle, especially if they have a problem. For example, they want to know where a shaft for a pump came from by using a 2D code, something which we are trying to offer in our machinery.

Do you see automation leading to less employment?

AS: This conversation also happened when the industrial revolution started in the 1800s and has happened every time disruptive technologies emerge. Of course, labor will be demanded in very different ways compared to how it is today.

EM: There will be more qualified and quality jobs in the future which are less repetitive and more focused on adding value to products. We will see a big peak in demand for technically skilled labor which will mean better paid jobs.

How do you plan to set yourself apart from companies like Rockwell Automation or ABB?

AS: Companies like this will actually be our suppliers; we will not compete with them. We are not an OEM as we do not produce our own product. We listen to a customer's needs and design a solution specifically for them, integrating technology from different companies. That is the core business of ATC: the design and conceptualization of the solution we provide to customers. The majority of our customers in Mexico are already our customers in the United States and about 80% of our business comes from repeat customers.

EM: Normally clients have an idea about a product they want to build, a target volume and the level of automation. We take these requirements to build a machine specific to their needs. After-sale services will also be a core part of our offering. Automation normally falls under maintenance departments of factories but many people in such departments are not familiar with these new automation technologies.

What are your growth targets going forward?

AS: We have a five year lease on our facility, a 16,000 sq. feet building, and our goal is that by the end of this lease we will have forty employees and the need to look for additional space. After first targeting the automotive and medical sector, we also need to explore the aerospace industry which is very big and attractive. Querétaro and the north-west of Mexico are key locations for the industry. ■



Raúl López

General Director
AMERICAN AXEL & MANUFACTURING (AAM) CASTING

How has AAM's acquisition affected the El Carmen facility?

AAM's acquisition of Metaldyne Performance Group (MPG) became official in April 2017. The El Carmen campus, which previously belonged to MPG and, before that, NovoCast, is now AAM's casting division campus. About 40% of AAM's business is in Mexico, as well as 5,000 out of 25,000 total associates, and we have two other large campuses in Querétaro and Ramos Arizpe. The El Carmen campus currently has the capacity to produce 80,000 mt/y per year, and so far in 2017, we are on track to produce the second-highest volume in the facility's history at around 67,000 mt/y. Nearly 85% of our business is

related to the automotive industry, and due to the current state of the automotive market, there is no need to look for customers in other industries. Before the acquisition, AAM was one of NovoCast's biggest customers, and the company still comprises about 60% of the facility's activity. The other 40% is divided between the heavy truck and industrial sectors. Whether directly or indirectly, 90% of our castings remain in North America.

What were AAM's main value additions to the castings division?

The El Carmen campus has been a 100% American entity since it was acquired by Grede Holdings in 2011. We went from belonging to a US\$1 million company in 2011 to a US\$3 billion company in 2014 with MPG to a US\$7 billion company this year. The biggest value addition AAM brings is access to new projects from them. We also have significantly more operational, strategic, administrative, and sourcing support than we had before. AAM is also very large group with an abundance of casting expertise that we can leverage.

How much effort does AAM Casting spend on automation research?

In 2005, automation comprised about 10% of our research efforts, but now it comprises about 50%. The manufacturing sector in Mexico is growing very quickly, and finding qualified labor has proven challenging, so many manufacturing facilities, including AAM Casting, see automation as a solution to this problem because it reduces the dependence on labor and improves working conditions.

Is there any validity to foundries moving from the US to Mexico due to regulatory costs?

Within the past several years, regulations in Mexico have become much stronger and they will continue in that direction. Therefore, if companies are moving from the US to Mexico due to more lenient regulations or because it is cheaper to comply with them, they will not benefit from this decision in the long-run. In general, cost struc-

tures between the US and Mexico are similar. Labor costs are lower in Mexico, but energy costs are higher, so they ultimately balance each other out. Logistics costs should be the main driver for a move to Mexico. As was the case with AAM, companies should relocate or expand because it brings them closer to their customers or suppliers.

After anti-dumping measures were introduced, are cheap castings still a threat to Mexican foundries?

Until 2016, there was a problem with the availability of high-quality castings, and there was a lot of cheap materials coming from China and Turkey. Now, most of Mexico's imported steel comes from the US, and the price is linked to the American metal market indexes. The biggest challenge from imported steel now is related to freight costs.

How sustainable is the recent boom in the Mexican automotive industry?

The automotive industry has been booming in Mexico because the US, Canada, and Mexican economies have all been doing very well, and people have disposable income to spend on cars. Each week, our customers are ordering high volumes. Automotive plants in Mexico are struggling to keep up with demand, and this will remain for at least the next few months. The industry is expected to slow down during the second half of 2018, but we will have a clearer vision of the industry's future once the NAFTA renegotiation talks are completed.

What is AAM Casting's growth strategy?

AAM Casting is currently operating at full capacity, but we see 2017 as a peak for the short-term due to macroeconomic factors. We will likely drop down to around 90% capacity, which is a healthy level. In the coming months, however, we will be adding some new projects to our portfolio, and we are looking to implement new technologies that will increase our productivity. ■



Patricio Gil

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 CEO
BLACKHAWK
 President
**AMERICAN FOUNDRY
 SOCIETY**

How has Blackhawk's business evolved in recent years?

Blackhawk has been continuously growing for several years. We built a second foundry in 2013, which is now operating at about 70% capacity. The original foundry is still operating at nearly 100%. We export about 25% of our products, and the remaining 75% stays in Mexico, though much of it is then re-exported by our customers. We are now in the engineering phase for a third foundry, and at the end of that phase, we will decide whether to go through with building it. Because the market has been responding so well, we are considering additional investment. The automotive industry is booming, so foundries from around the world are coming to Mexico to install capacity to supply the OEMs here. Additionally, we are seeing many automotive suppliers are moving to Mexico from abroad, and they are also using iron castings. Even though our capacity has been growing, it is still not enough to meet the demands of the industry. In the past five years, there have been at least 26 new foundries in Mexico, many of which are foreign.

What synergies exist between Blackhawk and the other companies that belong to Grupo Quimmco?

Grupo Quimmco is a very interconnected group of companies. For example, Blackhawk supplies castings to Sisamex and CNH, and we collect scrap from Forja de Monterrey. When Grupo Quimmco bought this foundry about 15 years ago, its only customers and suppliers for the first few years were Quimmco companies. We started developing customer relationships outside of the group in 2006 and now selling our sister companies is less than half of our production.

What progress has Blackhawk made in terms of automation, and do you see automation as a solution for a shortage of qualified labor?

Blackhawk has a heavy focus on automation, and we have made a lot of progress in the finishing and metallurgical processes, in particular. We have a computer system that analyzes metal samples and tells us exactly what to do with them. In some areas, automation can be seen as a solution to the labor shortage in foundries, particularly with the more dangerous jobs. That said, foundries still have to focus on employee retention.

Careers in the steel and iron industry are still very popular among recent university graduates in Mexico. However, the industry is still growing much faster than the number of qualified employees it has. Furthermore, foreign companies tend to steal existing talent from Mexican foundries. While it is a good thing that Mexican workers are getting more opportunities, stealing talent does not develop new talent, so we need to continue working on talent development and retention strategies.

What about Mexico's environmental regulations is attractive to US-based foundries moving into Mexico?

Mexico and the United States have very similar environmental regulations but it is cheaper to comply with them here. Currently a big concern among the foundry industry is the new law known as "silica rule" approved in the United States and starting into effect in June 2018. This new rule sets a new limit for silica exposure to workers, which is very low and difficult to comply with.

What effects have the NAFTA renegotiations had on manufacturing demand from Mexico?

When the new American administration took over, most companies suspended any decisions to enter the Mexican market. After a few months, however, we have not really seen any effect on the economy or on US-Mexico trade relations. We expect the NAFTA talks to have a happy ending.

What will be Blackhawk's main challenges going forward?

Our customers are now requiring more and more types of castings for the same order volumes, so becoming flexible is a key challenge for us. There are also many more grades of iron in demand than there were in the past, so the metallurgical process is becoming increasingly complicated.

What is Blackhawk's growth strategy over the next several years?

We want to continue our steady growth and remain working with medium-volume markets, such as tractors, heavy machinery, compressors, and construction equipment, among others. We still see plenty of opportunity in these niche markets, and we therefore hope to see the third foundry up and running within the next two or three years. ■

INVESTIGATIONS OVER UNFAIR TRADE PRACTICES STEEL PRODUCTS IN MEXICO

Source: Ministry of Economy, Mexico

	COUNTRY	PETITIONER	START	PRELIMINARY	FINAL	CURRENTS AD MEASURES	STATUS
Cold Rolled Coils	China	Ternium AHMSA	Apr 24, 2014	Dec 08, 2014	Jun 19, 2015	Definitive Duty: Baoshan Iron & Steel: 65.99% Tangshan Iron and Steel Group: 82.08% Beijing Shougang Cold Rolling, Shougang Jingtang United Iron & Steel, Others: 103.41%	Final determination of circumvention Investigation on July 11, 2016
Hot Rolled Coils	Germany China France	Ternium AHMSA	Sep 26, 2014	Jun 09, 2015	Dec 22, 2015	Definitive Duty: Germany: US\$137 per ton (ArcelorMittal Bremer) Others: US\$166.01 per ton China: US\$335.60 per ton (Tangshan) Others: US\$354.92 per ton France: US\$67.54 per ton(ArcelorMittal Mediterranée) Others: US\$75.59 per ton	Final determination of dumping investigation on December 22, 2015
Welded Pipe	United States Spain India	Tubacero Tubesa	Dec 23, 2014	Jul 14, 2015	Apr 20, 2016	Definitive Duties: USA: US\$575.01 per ton Spain: US\$62.22 per ton (Steel welded pipe and Others) India: US\$126.24 per ton	Final determination of dumping investigation on April 20, 2016 Administrative appeal decision of revocation August 12, 2016
Prestressed products	China Spain Portugal	DEACERO Aceros Camesa	Feb 16, 2015	Aug 06, 2015	Feb 26, 2016	Definitive Duties: China: US\$1.02 per kg Spain: US\$0.13 per kg Portugal: US\$0.40 per kg	Final determination of dumping investigation on February 26, 2016
Wire Rod	China	Arcelmittal DEACERO Ternium	Sep 02, 2015	Dec 22, 2015	Jul 28, 2016	Definitive Duty: US\$0.49 per kg	Final determination of the antidumping investigation on July 28, 2016
Ferrosilico- manganese	India	Compañía Minera Autlán	Sep 07, 2015	Mar 29, 2016	Oct 18, 2016	Definitive Duty: 40.25%	Final determination of the antidumping investigation on October 18, 2016
Flat Coated Steel	China Chinese Taipei	Ternium	Dec 17, 2015	Jul 29, 2016	Jun 05, 2017	Definitive Duty: CSC: 22.26% Taiwan: 52.57% Baoshan: US\$0.1874 per kg Beijing Shougang, Shougang Jingtang and Tangshan: 22.26% China: 76.33%	Administrative appeal decision of revocation November 21, 2017 Final determination of the antidumping investigation on June 05, 2017
Ferromanganese High Carbon	Korea	Compañía Minera Autlán	Jan 08, 2016	Jul 11, 2016	Dec 15, 2016	Definitive Duty: 35.64%	Final determination of the antidumping investigation on December 15, 2016
Welded Pipe	China	Forza Pytco Tubería Laguna	Dec 07, 2016	Aug 11, 2017		Preliminary Duties: Huludao: 65.05% Huilitong: 129.65% United: 143.82% Tangshan, Youfa Dezhong, Youfa Steel No.1, Youfa Steel No.2 and others: 202.55%	Preliminary determination of the antidumping investigation on August 11, 2017
Seamless Pipe	South Korea Spain India Ukraine	TAMSA	Dec 15, 2016	Aug 03, 2017		Preliminary Duties: South Korea: US\$131.10 per ton Spain: US\$376.54 per ton India: US\$206.70 per ton Ukraine: US\$170.11 per ton	Preliminary determination of the antidumping investigation on August 03, 2017
Cut-to-length Plate	Italy Japan	AHMSA	Nov 14, 2017				Beginning of the antidumping investigation on November 14, 2017





Construction and the Steel Industry

"Ten years ago, about 15% of the buildings in Mexico were made of steel, but that number has since risen to at least 25%. We believe this growth will be sustainable over the next five to ten years."

- María Cristina Frías,
General Director,
Fabrestructuras



For the Good of the Nation

Mexico's construction sector is increasingly using steel, a higher quality and more flexible material than concrete. The trend is likely to increase further following 2017's devastating earthquakes.

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In the center of Mexico lies the Bajío, a low-land region northwest of Mexico City. It has established itself, quite literally, as the motor of Mexico's economy, being home to much of Mexico's highly competitive automotive, aerospace, home appliance and wider manufacturing industries. These industries' growth has led to a building boom in places like Querétaro where the construction industry grew by 28.5% in 2017, driven in particular by investments in public works.

Grupo Ameristeel, which designs and assembles steel structures, has seen robust growth from the middle-income and above housing market in this region, reflecting the increasingly highly-skilled nature of the Bajío's labor force. "We are experiencing most demand in Querétaro and the wider Central Mexico region including Mexico City and up to Guadalajara," commented Juan Pedro Martín Navarro Cota, founder of Grupo Ameristeel.

Along with other construction services companies such as Estructuras Solana, Ameristeel is also experiencing solid demand from Central America, in particular from Panama.

All is not Well

Construction is a big deal to the Mexican economy, representing 8% of overall GDP and accounting for 15.7% of its overall

THE CONSTRUCTION INDUSTRY BY STATE

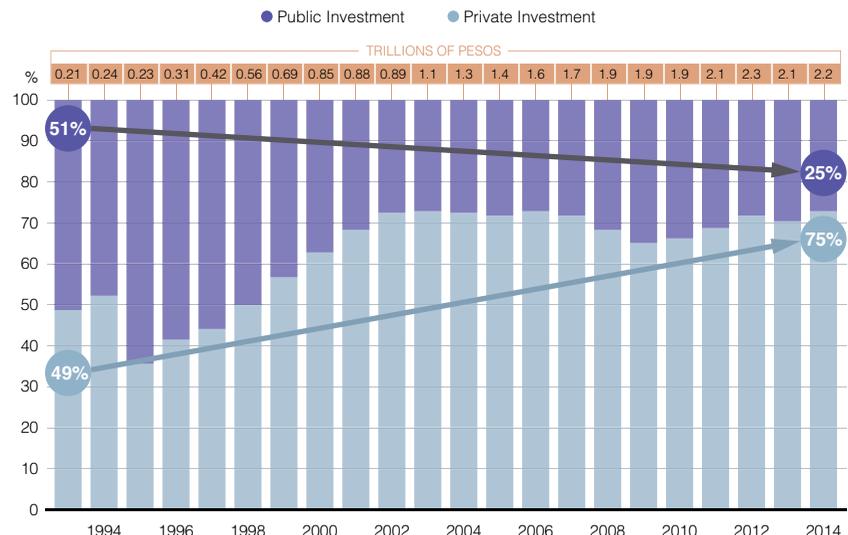
Source: CMIC

January 2015: % change compared to the same period of the previous year

Nayarit	53.8
Guanajuato	88.8
Morelos	70.1
Tlaxcala	42.7
Hidalgo	41.9
Baja California	40.5
Guerrero	36.2
Aguascalientes	36.1
San Luis Potosí	29.7
Nuevo León	29.3
Jalisco	21.7
Querétaro	16.6
Puebla	15.3
Quintana Roo	14.6
Campeche	12.1
Coahuila	5.6

ORIGIN OF INVESTMENTS IN CONSTRUCTION

Source: CMIC



workforce. However, whilst construction in the Bajío is buoyant, at a national level the construction industry is somewhat subdued. According to the National Institute of Statistics and Geography (INEGI), whilst construction growth was 2.6% in 2015 and 1.8% in 2016, in the twelve months to November 2017 average monthly construction growth in output averaged -1.5%.

A key determinant of demand has been government spending. In 2014, President Peña Nieto's government announced the National Infrastructure Plan for 2014-2018, which pledged to spend US\$596.2 billion across six sectors: communications and transport, energy, water, health, urban development and housing, and tourism. However, the government has had to cut back its planned investments as it implements fiscal austerity measures due to falling oil prices. Private investment has picked up some of the slack but the government's retreat has left market sentiment depressed.

Nevertheless construction companies are optimistic that developments are moving in their favor, with reconstruction after the 2017 earthquakes, the construction of the Mexico City New International Airport (NAICM) and the government's special economic zones policy all expected to drive demand. "The new airport is the most emblematic project from the current administration. Due to the size of the investment it represents a huge opportunity for the steel, construction, aluminum and glass industries," remarked Jose Luis Vargas, general director, Harsco Industrial IKG, which makes steel grating and security fences and supplied the 32 km security fence at the airport's construction site.

Steel got it

The strength of the construction sector is very important for the steel industry given that it accounts for 61.5% of steel usage. With drivers of the sector pointing in different directions, one would expect steel demand from it to be restrained. However, according to Maria Cristina Frías, general director of Fabrestructuras which designs,

fabricates and erects steel structures: "Ten years ago, about 15% of the buildings in Mexico were made of steel, but that number has since risen to at least 25%. We believe this growth will be sustainable over the next five to 10 years."

40% of US buildings are made from steel and Mexico is moving towards that ratio as well. As Mexico becomes richer, it is demanding the use of higher quality and more versatile materials like steel and iron in place of concrete. Frías puts it succinctly: "Simply put, buildings constructed with steel are always higher quality than those constructed with concrete. Steel is also easier to work with and, therefore, more flexible."

This trend will be boosted by the effects of the earthquakes as Mexico's public demands more seismic resilient buildings. "One of the greatest lessons of last year's event is that the materials of the works have to be durable and sustainable," insisted Fernando Gutiérrez, president of the Mexico's Association of Civil Engineering (CICM).

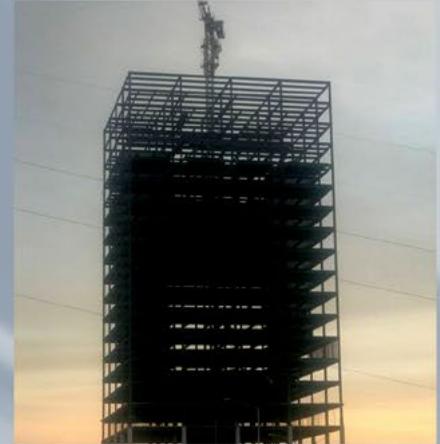
The need for reconstruction after the devastation caused by the earthquakes is urgent and steel is well suited to such an exigency. As Pablo Solana, operations director of Estructuras Solana and president of the Mexican Institute of Steel Construction (IMCA) commented: "Steel construction is much faster than concrete construction".

Steel has a reputation for being more expensive than concrete but this is not always the case and, in the long run, it may be cheaper to use. Solana continued: "The faster you complete a project, the faster you get income. Therefore, steel construction has many benefits that make it the right choice economically... Any building taller than four stories should be constructed with steel because the design is much easier and the structures are safer."

With Mexico's steel production breaching records and its advantages laid bare after the earthquakes, steel's popularity in construction will continue to grow. Navarro Cota certainly agreed: "Steel has very good ductility which we must be thankful for in particular in a seismic country like Mexico. In this regard, it is the best material ever. We are in love with it." ■



GRUPO AMERISTEEL



STRUCTURAL STEEL EFFICIENCY

Strengthening the heart of Mexico's urban development

Creating quality, efficient and safe steel design and solutions

Offering unique solutions to tonnage and density issues

Ensuring ease to fabricate and build structures





Gustavo Arballo

President
**MEXICAN CHAMBER OF
 CONSTRUCTION (CMIC)**

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What can the construction sector expect from the introduction of the new special economic zones?

There are already signed agreements to generate investments in the special economic zones. In Lazaro Cardenas, for example, meeting all of the infrastructure needs will require materials from the iron and steel sector that have not been considered before, including imported products. In a short period of time, we are expecting direct investments to build the factories and plants required in those areas. The increase in professional training is a major benefit of these investments, which means bigger salaries and better jobs. There are plenty of low-skill jobs in Mexico, but there are not many opportunities for advancement.

How much effort will be needed for the reconstruction of the areas affected by the earthquakes in September?

In total, earthquake reconstruction will be cost more than US\$2.5 billion over a wide range of states. Steel and iron will be used much more than before, including in the construction of 30,000 to 40,000 new houses, regardless of size. We are recommending that these houses have a certain standard of earthquake resistance. Most of the houses or buildings that fell had none of the basic structural requirements. The reconstruction will all be completed within the next 12 to 18 months, which is a difficult deadline to meet. In addition to houses, the reconstruction will also include schools, hospitals, and government offices.

What is CMIC doing to help with the earthquake reconstruction?

We are training people to learn self-construction alongside the engineers and specialists. The people who suffered the loss of their houses can now be part of the reconstruction. In this case, we must go to

the places where the earthquakes hit. We will also be handing out books that are designed to be very easy to understand so that the people can be prepared for any similar event in the future.

At the beginning of this governments' administration, the president promoted Mexico as the logistics platform for the Americas. What has that meant for the construction industry?

The president established these expectations because Mexico has significant competitive potential compared to other countries in the Americas. However, this requires a big investment to be made to make this expectation a reality. There is still a lot to build to make that platform possible. To have better logistics conditions, Mexico will not only need to build new infrastructure, but also spend a lot of money maintaining and repairing what we already have.

What have been CMIC's major milestones since you have taken over as president?

This is an important period for the government. The private sector has generated a high level of investment, countering the low investment from the government. It has been a difficult task because we have seen a lot of competition from foreign companies against local companies. Mexican companies have had chances to win many big projects, including the new airport. Private investments are starting to grow in the infrastructure sector, including hospitals and new roads. Most of the construction companies in Mexico are small- to medium-sized. It is great to see that the number of members of the chamber has been stable due to the benefits we offer. It means that what we are doing is on the right path. ■



Fernando Gutiérrez

President

MEXICO'S ASSOCIATION OF CIVIL ENGINEERING (CICM)

What are the main objectives of the National Civil Engineering Congress and what do you expect the ideal outcome for the 29th installment in 2018 to be?

In its 29th edition, the objective of the Congress is to present and discuss the proposals to transform Mexican civil engineering, the main concerns in the planning of infrastructure, the ethics of professional practice and innovation of the profession for young students and graduates, state of the art trends and solutions within the guild. Likewise, we will present the advances in the different disciplines of engineering so that young people can approach this profession and contribute to the growth of our country. The congress will have workshops and conferences that will give us innovative information and will undoubtedly be an approach to the path we have to follow in the coming years.

How would you characterize the relationship between the steel industry and the construction industry in Mexico?

It is a direct and extremely close relationship since, to carry out the projects that Mexico is currently building, and the prospective of construction are linked to steel, the element is key to be able to develop durable and quality infrastructure that responds to the needs of a country like the one we inhabit.

How significantly will the construction of the NAICM airport and earthquake reconstruction in central Mexico impact Mexico's steel and iron sector?

Steel is a key player in this important construction that will house all the entrances and exits of the city. Therefore, its construction and infrastructure must be made up of durable and high-quality materials such as iron, which support all operations. Being a structure and especially an airport, this material allows the structure to have greater strength. One of the greatest lessons of last year's event is that the materials of the works have to be durable and sustainable, in turn these must be manipulated, implemented and supervised throughout

the work by a professional who endorses the construction.

Construction in Mexico is dominated by SMEs. As the economy grows, how do you expect these companies to fare?

The companies that dedicate themselves to the issues of construction in Mexico have very good possibilities for growth in these times in which the country goes through a reinvention and resilience of the infrastructure. We live in a very retroactive country to invest as it grows more and more and that is where the private sector, small, medium and large companies have a greater possibility of investment.

Mexico recently pledged to cut carbon emissions 25% by 2030. What measures does Mexico's construction sector take to ensure a balance between productivity and environmental responsibility?

The construction industry has in mind that the environment comes first and must adapt the necessary measurements for conservation while being productive. Those regulations will change over the years looking for the future of our Planet.

In your opinion, why should multinational construction companies regard Mexico as a top business destination?

Mexico is a strategic destination with an open economy, competitive and with many opportunities regarding international trade. Mexico's government has worked very hard in creating laws that protect and promote private and international investment.

What are your expectations for Mexico in terms of global competitiveness in engineering?

We seek to evolve according to the challenges and develop more sustainable practices that add value to the construction industry. Mexico is currently seeking to not only promote foreign investment, but to invest as a country in other nations. Today we have to work as one world, creating one future for humanity. No longer can we see ourselves as an isolated country. ■



Juan Pedro Martín Navarro Cota

46 Founder and General Director
GRUPO AMERISTEEL

How did you come to establish Ameristeel and what are the company's main focus areas today?

In 1993-1994 my original intention was to become a building designer but I soon found out that to do that in Mexico you need to know about more than just design and therefore I became involved in fabricating steel structures as well. This was a welcome challenge and led to the founding of Ameristeel. Today the company, based in Querétaro, focuses on the use of steel as the most efficient means of construction. We look at how steel can be used across a variety of applications in construction, such as in houses, bridges, hospitals, parking lots, warehouses, hotels etc. Our focus is very broad. Right now, about 40% of our work has to do with living spaces, such as apartments.

Steel has very good ductility which we must be thankful for in particular in a seismic country like Mexico. In this regard, it is the best material ever. We are in love with it. Now it is an interesting time in our company as we are beginning to take on bigger projects and our production is at 1300 mt/y, something we never imagined we would reach when we started. We are working on tall buildings and have five tower cranes. Ameristeel is moving up to the next face of its development, which is both exciting and challenging.

How do you differentiate yourselves in the market?

As far as efficient design and solutions using structural steel goes, Ameristeel is of the highest quality. We are leading in providing solutions which have the least tonnage and density. At the same time, we make structures that are easy to fabricate and build.

What lies behind this is a very good team of engineers and the best software available, in particular a program called ETABS, developed by the University of California, Berkeley. In fact, our computer programs enable the best possible design and they save time as they enable us to build on existing shop drawings in the detailing process.

How have fluctuations in the construction market affected your business in recent years?

The housing market is very broad. We focus on the middle-income to above market, which is booming in Querétaro. At present we have 35 projects ongoing and a good pipeline of interesting assignments. The construction market is not as cost-driven as the industrial market and often Ameristeel is awarded contracts based on its quality of service even if it is not the cheapest. Construction is also a more delicate market as customers are concerned with having a perfect solution and avoiding vibrations or other problems due to the design.

Where are you seeing most growth geographically?

We are experiencing most demand in Querétaro and the wider Central Mexico region including Mexico City and up to Guadalajara, as well Central America. Ameristeel exports structures to Panama and Belize (but does not install them). There is a lot of opportunity for engineering projects in Panama, especially for lighter and more efficient buildings. We also have some work in places like Monterrey and Tijuana.

What has been the defining achievement of Ameristeel?

Almost two years ago we received a call from the State of Mexico government and were asked to build the structure for where the Pope Francisco gave a mass. We designed a structure which was 15m high and had a 70m span, curved and bolted so that it could be undone and used again in another location. From meeting the government at the very end of December 2015 to early February 2016, the job was finished. Even though it was not our biggest project, the timing and meaningfulness of it made it our proudest achievement. On the back of this, we have developed other long-span projects.

What are the key goals for the company in the next three years?

We want to be not the largest but the most reliable company in terms of quality and on time delivery in our sector. In the next two years we would like to reach 15,000 mt/y but do so with the satisfaction of our clients. Every day is a different day and that is what makes this business so exciting. ■

Sergio Ramirez

General Director
**ACCIONA
INFRAESTRUCTURAS**



What are the main areas of expertise that Acciona brings to the new Mexico City International Airport (NAICM) consortium?

Acciona and all of the other companies working on the NAICM construction are bringing their expertise to the specific areas in which they are needed. Acciona is very knowledgeable and skilled in steel and superstructures, so we are helping with the steel and superstructure design for the first terminal. We also buy from all over the world, so we have a lot of knowledge about buying outside of Mexico. The consortium operates as a joint venture, and the project is quite complicated. All of the people on the project are working hard to keep the timeline moving according to plan.

The Mexican government just set a goal to reduce carbon emissions by 25% by 2030. How does this affect the Mexican construction sector, and what steps does Acciona take to promote environmentally sustainable practices?

Acciona has developed our own specific regulations to which all of our projects must adhere. These regulations not only keep us up-

to-date with the government's requirements, but also with our own personal goals. We are always aware of the environment during our construction. For instance, the NAICM will be a green airport. During the construction, we will be implementing the top regulations so that the building of the airport will be environmentally very clean. As we are a renewable energy company, we have zero emissions on our electricity projects. We are very proud that we are producing these types of projects within the green energy stipulations. The environment is the most important factor of all of our projects.

In your opinion, what are the benefits of using steel over any other type of infrastructure material when building the NAICM?

The main reason Acciona is using steel is from a design perspective. The plans for the consortium are very large, and steel is great for large structures that need to be built quickly. There will still be concrete involved in the construction process, but steel is the most beneficial material to ensure we are prepared for earthquakes, for example. ■

Isidro Martínez

General Director
GRUPO TAURO



Could you please give a brief introduction to Grupo Tauro?

Grupo Tauro was founded in 1979 to manufacture, sell, and install steel chain link fencing based on wire and all of its components, including fittings, gates, and barbed wire. Grupo Tauro offers a perimeter protection system with high-quality materials, and we have a trained staff of 200 employees and offices around Mexico that are at our customers' service to define their needs. We also export certain products to the US and Canada, including temporary fence panels and crowd control barriers for construction sites and events. Our annual capacity is about 30,000 mt/y of steel components, and our sales increase at about 5% each year.

Grupo Tauro also includes a second company, Planobra, which was founded in 1989 and manufactures and sells the TERKO system, which is a mechanical wall stabilization system meant for bridges. Planobra is committed to the investigation and development of processes that facilitate increased security and quality to its end users.

Given that Grupo Tauro does a lot of business in the US and Canada, how have the NAFTA renegotiations impacted your business decisions?

Mexico has trade agreements with more than 40 countries, and NAFTA is very important for trade with the US and Canada. Fortunately, our steel fencing product volumes are not large enough to be affected by US importation changes. Regardless, we expect the three countries to recognize the many benefits of the agreement and not make many changes. We will continue working on improving our productivity to maintain our competitiveness in the US and Canada.

What are Grupo Tauro's main growth drivers in Mexico?

Within Mexico, we have seen an increase in infrastructure expenditures by the federal government in an effort to revitalize the Mexican economy during the second half of 2017. We expect this to continue in 2018 as the current administration aims to gain national confidence by increasing the minimum wage and improve individual purchasing power prior to the federal elections. ■



Maria Cristina Frías

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General Director
FABRESTRUCTURAS

Could you please give a brief introduction to Fabrestructuras?

Founded in 1958, Fabrestructuras was one of the first companies in Mexico to design, fabricate, and erect steel structures with bolted connections. Because of our bolted connections, which are still quite uncommon, we do not do any onsite welding. Fabrestructuras was also one of the first to establish quality control systems in Mexico. Since its founding, the company has served the steel construction industry both nationally and internationally, mainly in the construction of industrial buildings, warehouses, residential and office buildings, bridges, and certain government concessions, including schools and hospitals. Today, the capacity of our plant is about 250 mt per week.

What are the benefits of belonging to the Mexican Institute of Steel Construction (IMCA)?

IMCA was founded by my father, Fernando Frías, who was very interested in transferring knowledge from the American Institute of Steel Construction and from around the world to Mexican engineers. At the time, there was no steel construction manual like the one that was in the US, so he translated it into Spanish. Now, a new Spanish manual is published in Mexico every five years. IMCA also hosts a symposium every two years, which includes steel construction experts from around the world and emphasizes innovation and technology. The next symposium will take place in 2019.

Within the construction sector, how can family-owned SMEs compete with larger companies?

The biggest differentiator between small and large steel construction factories is that the small factories tend not to have the machinery required to handle large jobs. Certain machines can be operated by multiple people at a time, which improves efficiency and productivity, but machines of this size are very expensive and are therefore typically owned by larger construction companies. The larger the company, the more efficiencies it can afford.

What are the benefits of constructing with steel instead of concrete?

Simply put, buildings constructed with steel are always higher quality than those constructed with concrete. Steel is also easier to work with and, therefore, more flexible. Furthermore, steel is more robust and protects buildings better against earthquakes, for example. There are computer design programs that can detect to a certain degree of precision the sway of a steel beam, which helps to prevent the effects of natural disasters. Nowadays, there is not even a significant price difference between steel and concrete because steel can now be imported. Any building taller than four stories should be constructed with steel because the design is much easier, the structures are safer, and the cost is negligible.

How might the NAFTA renegotiations affect your business?

The NAFTA renegotiations have brought uncertainty to business in Mexico, since new investments are on hold until the end of the talks. This has brought some negative effects to the Mexican economy, including a raise in the exchange rate and, therefore, the prices of materials and employment. In Mexico, we all know that ending NAFTA as it is can have a big impact on the way small businesses function. In this scenario, we believe US businesses might move from Mexico to the next-cheapest option in Latin America or to Asia. In Mexico, we prefer the end of NAFTA than a bad renegotiation. In this scenario, Mexico will have a great opportunity to do business with many other Countries. Mexico has over 40 free trade agreements. Regardless of the outcome, we believe the effects for us will be positive due to a strong steel industry in Mexico.

What is your outlook on the steel construction sector over the next several years?

About 80% of the buildings in the UK are made of steel and about 40% of the buildings in the US are made of steel. As of ten years ago, about 15% of the buildings in Mexico were made of steel, but that number has since risen to at least 25%. We believe this growth will be sustainable over the next five to ten years. There are noticeably more steel factories in Mexico now than there were ten years ago, illustrating the rise in demand. ■

Pablo Solana



Operations Director

ESTRUCTURAS SOLANA

President

**MEXICAN INSTITUTE OF
STEEL CONSTRUCTION (IMCA)**

What are Estructuras Solana's major updates over the past few years?

We have made significant investments over the last few years to support new sectors, including industrial construction, house construction and private investments. Right now, we are building what will be Puebla's two tallest steel towers, which will be between 90 and 100 meters tall. We hope to finish them by May 2018. In 2015, we created a five-year strategic plan duplicate company growth.

As a mid-sized, family-owned company, how does Estructuras Solana compete with larger players in the sector?

Our strategy is to make alliances with other companies. In fact, there are some strategic alliances within the steel construction industry so that more SMEs are able to compete with those companies. Estructuras Solana is not part of these alliances at present, but we are looking forward to being part of one, since this is a team effort and tasks cannot otherwise be done. We are one of the oldest companies in the Mexican steel construction industry. We have been in the market for 62 years, so that reflects the credibility of our brand. We are a company that has survived a lot of financial crises and we are still operating. In short, we have a very strong work ethic and are able to work on many projects simultaneously.

If concrete is cheaper than steel, when are the benefits of steel that make it worth the extra investment?

Steel is not necessarily more expensive than concrete if you look at it from an economic perspective. After each stage of construction, the use of steel makes overall costs lower, including better delivery time and longer-lasting material, which means less maintenance long-term. Also, steel construction is much faster than concrete construction. The faster you complete a project, the faster you get income. Therefore, steel construction has many benefits that make it the right choice economically.

What are Estructuras Solana's goals over the next few years?

We are going to dive deeper into vertical edification. Also, we will diversify our niche markets so that we can grow and not depend on just one. For example, we plan to enter the commercial market, including shopping malls and plazas. In case one of these business models fail, we can rely on the others. Last year, we sent structures to Panama for the first time. The Panama market is attractive because there are not many companies that make large metallic structures. As a result, there are several Mexican companies that have entered the market there. Central America will be the next big market for Mexican companies to give support to construction developments and techniques.

What are the main benefits of belonging to IMCA?

The main reason to be part of IMCA is to promote steel construction in Mexico in every aspect, including steel production, distribution, design, and building. We offer our partners many advantages, including training, networking, and events. We have an international symposium every two years where we discuss and listen to presentations about steel construction innovations happening around the world. Next year, our symposium will focus on seismic design. ■

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Jose Luis Vargas

General Director

HARSCO INDUSTRIAL IKG

How has Harsco's business performed in Mexico over the last three years?

Even though the growth rate has not been as big as we expected, it has led to some good projects for our business. Commercial construction by private investors is driving growth in the Mexican economy and this is a big opportunity for our company. Making business with private companies is also easier than with the government.

Harsco Industrial has been in Mexico for the last 62 years so we are very experienced in dealing with various economic, political and social challenges which are all part of doing business here. With the recent challenges we have innovated and reinvented the company to attract new customers and keep existing customers.

How have you diversified your business in recent years?

The first thing we did was to talk to our customers and analyzed their feedback. They told us we were reliable and compe-

tent in providing steel grating, and have a lot of integrity, but that they needed more security solutions. They regarded us as security providers and felt we could provide more services in this area. We invited our employees to propose new products and one of the most common suggestions was high-security fences. We traditionally served the oil and gas market but now our market is much bigger, including construction for schools, airports, prisons and so on and the automotive industry. There is much potential.

Is the market competitive in Mexico for the products you provide?

We have traditionally had two main competitors in steel grating products but last year a new company entered the market. The competition for fencing products is much bigger as there are not just Mexican companies but ones from the United States, United Kingdom and Spain. However this is a good thing because it makes us think about how to always be better.

Where do you typically source your steel from?

We consume domestically produced steel from AHMSA and Ternium and we participate in Canacero which works with the government to impose taxes on imports from countries like China. Pemex also has a 60% national content requirement. To purchase steel for grating from China is more expensive than the highest price in Mexico and it is not as reliable in terms of on-time-delivery and quality. Therefore, China is not a concern for our company. However, other companies providing steel wire in Mexico are facing dumping practices from China.

Harsco is a worldwide company with \$1.5 billion in revenues in 2016. What are the benefits of being part of the group and do you have any other key differentiators?

This is one of our biggest advantages. Mexico receives a lot of foreign investment, such as from oil and gas companies based in Italy and Spain, which are looking for a reliable vendor. Since Harsco is a public company with a presence in 52

countries they prefer to do business with companies like ours. They have more confidence in the quality of our products, our integrity, experience and the support network behind our offering. We will provide them with complete solutions by installing our products rather than only providing the material. The relationship between Harsco and the Irving brand is also important as it is a very well-known in Mexico. We are the brand that all the competitors are trying to emulate.

How is Harsco supporting the Mexico City New International Airport (NA-ICM) and what does this project represent for Mexico?

The new airport is the most emblematic project from the current administration. Due to the size of the investment it represents a huge opportunity for the steel, construction, aluminum and glass industries. We have provided the high-security fence for the beginning of the operations. The airport is facing many social and political problems and there are groups which are against it. The fence is about 32km, of which we provided 100% and installed, therefore providing a full package of services.

What are you most proud of about Harsco and what are the company's plans going forward?

We need to consolidate the company's presence in the high security market, after two years in this market. Just like we are the number one option for steel grating, we want to be the same for high-security fencing. We also want to introduce additional products, such as fiber glass reinforced with plastic for the offshore oil and gas industry, which has more resistance than steel and is corrosion-proof. Furthermore, we are working on proposals to supply further products for the new airport.

Our proudest achievement is the fact that, after embarking on these new solutions, players in other industries and countries are emulating our business model. Now we are exporting knowledge and technology from Mexico to other parts of the business, whereas before we would import it from our corporate office. ■

Jonathan Benítez & Héctor Samuel Martínez

JB: Regional Sales Manager

MABEY BRIDGES

HSM: Director General

GLOBEX MART



JB



HSM

Could you provide an introduction to Mabey Bridges?

JB: We are the original producers of the Bailey bridge which was designed during WWII to quickly replace damaged bridges. From that time onward, we have been further developing modular bridges, which can be quickly and easily installed.

All of our production is based in the United Kingdom and we export to more than 140 countries worldwide. We are steel transformers and all of our bridges are made out of the material. Our capabilities include engineering, design, manufacturing and delivery. Mabey's main markets are road infrastructure, mining, oil and gas, renewable energies, as well as agricultural which is growing. Our penetration strategy includes working with distribution representatives and in Mexico we are working with Globex Mart. We expect very good results from Mexico given it is one of main markets in Latin America due to its size and the government's reforms.

How great is the potential in Mexico for Mabey Bridges?

JB: We see most opportunity in rural development where the government is investing and there is a lot of need. A bridge brings economic opportunity to poorer regions. In the road infrastructure sector, Mexico has much room for growth and the government is investing a lot into this potential. Due to the reforms pushed by the government there has been increased investment by private players in industries such as mining and oil and gas. We work with a lot of EPC companies that are developing oil and gas projects that typically require bridge infrastructure. In terms of mining, there are five economic clusters where we have found it very useful to do business.

What are the key advantages to your bridges?

JB: Nowadays the world requires more resilient infrastructure due to more frequent and intense storms. Climate change is a reality and hydrological records are not reliable anymore. Designers and engineers are facing the challenge of adapting infrastructure to new climate conditions. Steel has many advantages over concrete. With it you can create larger bridge spans so that

creeks and rivers remain untouched, a key requirement of the government's, making the bridge less vulnerable to storms. We just sold a 100 m single-span bridge in Canada which will not affect the hydraulic area of the river it crosses. A similar bridge built with AASHTO Type IV pre-stressed concrete beams would require three to four intermediate piers to be constructed within the river cross section.

Furthermore, all of our bridges are produced using automated processes so the quality of welding is very high and constant. The speed and ease of mounting and installation of steel modular bridges are also key advantages; someone who has never assembled a bridge will be able to do it supported by our site advisory service. On average, a two lane, 30 m bridge will take five days to be constructed. Our bridges also have additional components called seismic restrictors that are resilient to earthquakes. In general, when it comes to supplying bridges in Mexico, we base the design in accordance with the standards IMT20.5 and IMT66.5 required by the Secretariat of Communications and Transportation.

What is the distribution strategy of Mabey Bridges in Mexico?

HSM: The market is more orientated to concrete construction but we are convincing companies and the government of the advantages of steel bridges. Mexico is very price sensitive and Mabey has done a good job of reducing the cost for the market here. We have employed different strategies according to the mining, roads (temporary and permanent) and natural disaster segments. The technical support we provide is crucial; we are not just selling a steel product, we are selling an engineering system.

What are your key goals in the next few years?

JB: As well as helping the government be more resilient to natural disasters, we want to have a strong position across Mexico in other sectors. We want to be the first option for bridges in the rural sector. Our main focus in the next few years is on helping rural development, resilience and quality of life. When it comes to resilient infrastructure, steel is here to stay. ■





Distribution, Service Centers and Logistics

"Overall, there are too many service centers in the market, but it depends on the end use. For automotive and home appliances there is not an overcapacity, whilst in commercial and construction industries there is a considerable amount."

- Mauricio Morales,
General Manager,
Galvaprime



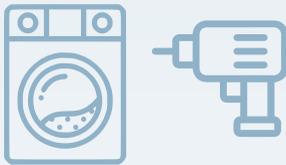
STEEL CONSUMPTION SECTORS

Source: CANACERPO



CONSTRUCTION

61.5%



METALLIC PRODUCTS

18.8%



AUTOMOTIVE INDUSTRY

10.6%



INDUSTRIAL MACHINERY

7.8%



ELECTRIC EQUIPMENT

1.3%

The Market Keeps Rolling On

For years there has been overcapacity in the steel distribution and service centers market, especially for commercial steel, but expected consolidation has not occurred. In fact, more companies have entered the fray.

A striking characteristic of Mexico's steel sector is the high participation rate of distribution companies in the steel market, which is the opposite of other Latin American nations such as Brazil and Argentina, where producers tend to operate their own distribution. The roots of this situation lie in a market traditionally made up of small, highly localized metal processing shops, but the characteristic has remained even as customers have grown larger and gained greater purchasing power. Unsurprisingly, the distribution and service centers market is large, accounting for approximately 22,000 jobs and around 20% of total employment in the Mexican steel sector. It is also extremely varied, from distributors focusing on holding large inventories to highly specialized service centers whose goal is to add value to the base steel they supply.

The market can be split into two distinct segments: commercial and industrial. Commercial players typically service the construction market, whilst industrial players focus on the wider manufacturing industry. For years commentators have identified overcapacity in the commercial distribution and service centers market, and the logical extension of this is that consolidation in the market must be just around the corner. However, this has not materialized. "There are many players with thick skins and deep pockets that have survived the storms. One or two have gone bank-

rupt, but there have been no acquisitions or mergers," remarked Francisco Pontón, director general of service center Steel Warehouse Mexico.

Mexico Continues to Build

Construction growth was a reasonable 2% in 2016, according to the Mexican Chamber of Construction (CMIC). 2017 growth is expected to be around 1.5%, but mega-projects such as the new airport for Mexico City could mean renewed vitality for commercial steel distributors and service centers. "Construction of the NAICM airport will also drive the industry. We received a quote for 100,000 mt of steel from one of the construction companies that has been contracted to help build the airport, but this is an unrealistic request," commented Héctor Morales, general director of trader and distributor Aceroteca, underscoring the scale of the demand from this project.

There also appear to be spikes in demand in certain regions, with distributors such as Dalsa reporting strong demand in the northern state of Chihuahua and construction and engineering company Grupo Ameristeel seeing robust construction growth in Querétaro in central Mexico. "Steel for construction, such as rebar, has grown due to the large number of high-rise buildings that have been built," explained Jorge

Treviño Portilla, general director of Dalsa. On the other hand, public sector demand in the construction sector has slowed as the government attempts to consolidate debt.

Follow the Money

Despite the resilience of the construction market, the industrial steel market still looks far more promising in comparison, and service centers are rushing to gain a slice of the pie. “Overall, there are too many service centers in the market, but it depends on the end use. For automotive and home appliances there is not an overcapacity, whilst in commercial and construction industries there is a considerable amount,” commented Mauricio Morales, general manager of the service center Galvaprime, which focuses on the industrial market.

Asian companies have entered the industrial market in recent years, especially from Japan and Korea. Typically, they base themselves in the Bajío region in central Mexico due to the high concentration of automotive OEMs there, such as Toyota, Honda, General Motors, and Volkswagen, and bring with them high quality equipment.

The strong performance of the automotive and appliances sectors has driven the demand for higher value-add from service centers. Indeed, the increased sophistication of service centers mirrors the growing production of specialized steel for automotive industry in Mexico. This has necessitated that service centers invest in state-of-the-art technology, something the sector has been criticized for not doing in the past. Instead, it has tended to buy used, out-of-date equipment from US companies. “All of the equipment we have bought since 2010 has been brand new equipment mostly from Europe so that we can guarantee good flatness and squareness and meet the requirements of ‘Class A’ exposed materials for the automotive industry,” commented Morales.

Just as the big producers are moving up the value-chain and producing more sophisticated steel, so must the service centers invest in upgrading their capabilities to serve the changing needs of Mexico’s maturing economy. ■



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Mauricio Morales

General Manager
GALVAPRIME

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Could you provide an overview to the company's history, main activities and any recent updates?

First of all, I am excited to announce this year was our tenth anniversary; we are truly thankful to all of our commercial partners for this enriching experience. Galvaprime continues to focus on the industrial market and the main industries we serve are automotive, appliances, heat ventilation and air conditioning and electrical equipment. Recently, we made an important investment into new equipment from Europe, specifically cut-to-length and slitting lines, which has given us more capacity. In fact, we practically doubled our processing capacity to 180,000 mt/y. Now we can process wider widths and thickness and focus on advanced high strength steel, up to 1600 MPa, which is used a lot in the automotive industry. We have also expanded our facility by 7,000 square meters along with more cranes in order to increase our storing capacity.

We have been keeping up with orders from the automotive industry which is booming and looks set to keep growing with many investments in the pipeline, despite risks like the NAFTA renegotiations. Over the last year, we expanded our product portfolio to the commercializing and processing of pre-painted materials, aluminized, electro-galvanized materials, stainless steel and metals such as aluminum. Our focus continues to be in the automotive and appliance segment, nevertheless we serve some special products for the construction segments as well.

How advanced is the technology and equipment Galvaprime uses?

All of the equipment we have bought since 2010 has been brand new equipment mostly from Europe so that we can guarantee good flatness, squareness and to meet the requirements of 'Class A' exposed materials for the automotive industry. We have also made significant investments into information technology.

Automation is transforming the industry. Are you focusing on this trend as well?

Our goal is all about productivity and we are aiming to be the most efficient service center in Mexico that guarantees top quality while being competitive. Therefore investments in technology and automation of

lines are key factors for Galvaprime. We have also invested in measuring instruments to control the thickness of material while processing materials in our slitting line. In addition, we have installed new automated equipment on our slitting line to increase productivity.

Have the number of service centers grown in recent years in response to industry trends?

We have seen a significant increase since 2013. A lot of Asian companies, in particular from Korea and Japan, have set up businesses in the Bajío region, which is also an important region for Galvaprime. Multiple service centers are focusing on the automotive industry due to its higher growth rates.

Overall, there are too many service centers in the market but it depends on the end use. For automotive and home appliances there is not an overcapacity, whilst in commercial and construction industries there are a considerable amount. Nevertheless, we may be getting to a point where there is overcapacity for automotive and appliances.

What are some of the specific requirements of the automotive sector?

The trend is to move up to third generation, advanced ultra-high-strength steels. This is so that the industry can produce vehicles with lighter weight and thickness with the same or even better performance. Currently, there is a lack of such steel production in Mexico, however investments are being made as we speak, so shortly we will have more availability.

What is your vision for the company in the next five years and what has been your most rewarding achievement so far?

We want to keep focusing on the automotive and appliance industry, working with Tier 1 and 2 clients, processing high end products and improving our processes to become more efficient.

It has been very rewarding to experience the growth we have had with respect to our workforce, from five employees 10 years ago to almost 100 today. Our collaborators' talent is what has got Galvaprime to where it is and really differentiates it from other players in the market. We are truly committed to our people and to Mexico. ■



Héctor Morales

General Director
ACEROTECA

Could you please give an overview of Aceroteca's history in Mexico?

Founded in 1991 by Juan B. Morales, my work with Aceroteca began as a sales representative for Ferrostaal. For many years, our core business was steel trading. We sold steel from all over the world to our clients in northern Mexico. We were very successful, but Ferrostaal decided to withdraw our agreement rights and set up its own office here. After this happened, we began working with what at that time was Thyssen Trading following a similar model. Once again, due to the good sales volumes we generated, the company decided to set up its own network. I was invited to be the sales manager for them in our area, so I became an employee of Thyssen Trading for some years. In 2004, I wanted to do business for myself again, and Thyssen supported my comeback as a representative of them in the North part of Mexico, which is when the second part of Aceroteca's history began.

Throughout the company's history, we have built strong relationships with local mills, including HYLSA, IMSA and AHMSA. These large corporations used to be family-run, and we had very good relationships with them so focused the trading business on the export market with support from domestic mills. In 2007, this scenario changed again as HYLSA, and later IMSA, were bought out by Ternium, and the need for export services disappeared. At this point, we were forced to adapt our business model again. Aceroteca continues to export hot- and cold-rolled coils from AHMSA but now also distributes various leading brands of equipment to steelmakers.

What was the motive behind splitting Aceroteca Mexico and Aceroteca Trading into two, distinct businesses?

Aceroteca Mexico remains as a steel industry equipment and spare parts provider that represents brands from around the world. We decided to branch out Aceroteca Trading to capitalize on the idea that the combination of a trader and a service center could bring something new to the market and offer our customers more competitive prices. As a trading company, we are not necessarily importing our materials. We distribute steel from AHMSA, Ternium, ArcelorMittal, and other local mills. Steel trading to us means being the

purchasing arm of our customers, giving them our knowledge of the market, personalized service and credit to finance their operations. The advantage to our business model is that we can provide different supply options to our customers and use any service center to process our steel while supporting them by financing their operations. We are also looking into having our own warehouse in the near future for distribution purposes or establishing a partnership with another company, but this is still in the works.

What synergies led to partnership between Aceroteca and IMS Systems?

IMS has been working with Aceroteca in Mexico for over 15 years. When their business started growing, they wanted to be more present in Mexico while maintaining a partnership with us. We started a partnership where IMS owns 60% of the IMS Mexico, and Aceroteca owns 40%. That way, we can provide IMS customers maintenance and spare parts services locally.

From your perspective, what are the main macroeconomic drivers of the steel industry in Mexico?

The Mexican automotive industry has been growing rapidly, and there are still more auto plants coming. Ternium has announced new projects to increase its capacity, ArcelorMittal also will invest in a hot-rolled coil plant, and Nucor is building a new galvanized strip plant in San Luis Potosí. All of these projects are largely driven to substitute imports and increase their market share in the automotive industry. Construction of the NAICM airport will also drive the industry, but this project is still in its early stages.

What is Aceroteca Trading short-term growth strategy?

We would like to continue growing at a steady pace so that we can focus on the quality of our services. We grew by 50% from 2016 to 2017, and our goal is to grow by 30% from 2017 to 2018 and then 25% per year for the following three years. Service is the key; the main reason for our growth is that our customers see how much we care and follow up on their orders, and we want to continue to develop these types of personal relationships to promote constant growth. ■

Francisco Pontón



Director General

**STEEL WAREHOUSE
MEXICO**

How has the macroeconomic situation affected your business in recent years?

We have had a good few years but, with its size, Mexico's economy should be growing at 6% to 7%. There is a large amount of private and foreign investment fueling the economy. But the steel industry is doing well despite the economy and also our performance has little to do with President Peña Nieto's reforms, of which we are still waiting to see the results. In fact, our gas costs have gone nowhere but up. The government's decision to stop subsidizing gas is understandable as the peso has stabilized relative to the dollar but they could have cut other day-to-day expenses. Currency fluctua-

tions also hurt our industry, especially when buying in dollars and selling in pesos.

We are blessed and we are damned by being close to the United States. A lot of the steel products produced in Mexico go into sub-assembly or finished products for the US market. Trump's rhetoric has actually caused big OEMs to fast forward their projects in Mexico. We were really nervous at the end of last year but we learnt that the dog barks but does not bite.

What are the key industries you serve and what key developments have there been since 2014?

We have added more laser fabrication capacity and are working towards integrating more our portfolio of solutions with our customers' operations. So instead of commodity goods we are trying to sell more value-added products that help our customers be more efficient. We work on major capital expenditure items and serve clients in many markets including mining, agriculture, construction equipment and transportation. We serve the Mexican market and export to countries globally, including Chile, Colombia, Australia and India.

How do you differentiate yourself in the market?

Our technology remains cutting edge and now OEMs specifically request their suppliers use Temper Pass line technology such as ours. Although, today we have more competition as there are now three Temper lines. There are companies that try to emulate what we do with cheaper investment with obvious tradeoffs as they are not as efficient. Our key differentiator is quality. We also have big purchasing power compared to other companies as we trade 1.5 million mt/y. There are many players with thick skins and deep pockets which have survived the storms. One or two have gone bankrupt but there have been no acquisitions or mergers. We always keep our eyes open for acquisitions.

How will external factors like the NAFTA renegotiations, the special economic zones (SEZs) and the reconstruction after the earthquakes affect the industry?

It will be a very stupid decision to exit the free trade agreement. Even US industry have been advocating against the absurd proposals of the US government as it will hurt many sectors such as agriculture and raise prices for consumers.

Reconstruction after the earthquakes will bring nothing but opportunity. This and the new Mexico City airport will create a boom in demand. The SEZs are a great idea but we will see about the execution. The flat products market is an oligopoly consisting of ArcelorMittal, AHMSA and Ternium. ArcelorMittal used to only produce slabs which were used as raw material by Ternium. However, Ternium this year bought ThyssenKrupp's assets in CSA Siderúrgica do Atlântico so they are now self-sufficient in slabs. However, one of the SEZ is in Lázaro Cárdenas, Michoacán, where ArcelorMittal has its facility. Therefore the SEZ policy will benefit ArcelorMittal.

How do you see the market for flat products evolving in Mexico?

It will get very competitive as now the three players will produce hot rolled steel. AHMSA has set up a steckel mill so that they can produce coils up to 96 inches wide. ArcelorMittal will produce coils up to 80 inches wide and Ternium with its new investment will produce 84 inch wide coils. This will fundamentally change the steel sector. It is going to be a blood battle. ■

GRUPO ACEROTECA
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Ruben Sifuentes



General Manager
VENTACERO

Could you please give a brief introduction to Ventacero?

Ventacero has 43 years of experience in steel distribution. We mainly distribute commercial quality coated steel and steel sheets. We distribute steel from many of the main producers, including Ternium, Prolamsa, and Deacero. We have a large variety of products and sizes, which allows us to react faster to what the client wants. We are currently working on building up our inventory based on an analysis of our clients' needs, including hardware products and steel for heavy structures. We have also developed a service center where we have machines that can make pieces with specific measurements. We have clients across a number of different industries, including metal mechanic construction, automotive, and machinery, for example.

What are Ventacero's main competitive advantages?

Construction companies require a variety of products and for their plants, and it is often difficult to establish geographic inventory and financial credit. We have 23 branches located throughout Durango, Saltillo, Torreón, and Aguascalientes, which makes it easier to have a commercial relationship with our clients and provide a personalized service according to their needs within the time they require. We have also been able to improve our loan and credit options. We have credit insurance, which helps us avoid risk and allows us to give it to companies across different industries. The advantage of this service is based on our wide inventory, which serves to satisfy the needs of our clients.

What impact do the NAFTA renegotiations have on Ventacero's business?

In the case of the cancellation of NAFTA agreement, we believe the price of our products would increase. At the same time, however, we may have the opportunity to open new business lines. The new American government administration, in general, has no real effect on economic activity, but it does have a strong impact on public opinion and could influence the behavior of our clients in the future. Ventacero is 100% Mexican, and our operations are in Mexico.

In 2014, we could see that the industrial steel market was growing much faster than the commercial steel market. Is this still the case today?

We have seen growth in the commercial steel market within the construction sector. Depending on how much the construction

market grows, it will directly affect commercial steel demand. As for the industrial steel market, we have noticed that big steel companies are creating partnerships with Japanese companies to produce special products for the automotive industry. The industrial steel market is growing globally, whereas the commercial steel market grows according to the reality of the country.

The current Mexican government administration has strongly promoted the steel industry. What are the benefits to having strong government support?

Promoting the steel industry is not always good if the government focuses too much on bringing foreign companies onto Mexico's biggest projects. It would be beneficial if the national industry were better promoted and supported. If this is not the case, then a real benefit does not exist. The governor of Durango has done a great job promoting the local industry, and there are some very impressive projects that will materialize within the next five years. We are very optimistic about Durango's growth prospects. ■

GRUPO ACEROTECA
Aceroteka Mexico - Aceroteka Trading - IMS SYS Mexico

ACEROTECA MEXICO ACEROTECA TRADING

Aceroteka Mexico represents the most important steel manufacturing companies in Mexico.

Aceroteka Trading is the combination of a trader and a service center enabling us to offer our customers more competitive prices.

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Jorge Treviño Portilla

General Director
DALSA

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Dalsa was founded in Chihuahua in 1978. Could you provide an overview of the history of the company and its main focus today?

Like most steel companies in Mexico, we are a family-run business. My father started the business by representing the main steel enterprises in Monterrey and selling in Durango, Chihuahua and Coahuila. Initially, the company specialized in the wholesale of galvanized sheets for roofing. I started in the company in 2001 and since then we have focused more on market niches, which has worked well for us. For example, we started supplying galvanized flat sheets that go into air vents in buildings and we now lead this market in Chihuahua. Then we focused more on structured buildings and saw that there was a gap between producers and mid-level distributors and we began filling this gap. This powered our growth and led to us setting up more sales offices in Chihuahua

and we now have five branches in the state. We not only handle the commercialization of steel but also the logistics of transporting it to our clients.

What are the main application markets of the steel Dalsa sells and what is the value-add the company brings?

As well as construction, we also serve the industrial market, for example in Cuauhtémoc where there are many steel fabrication companies which export products such as heaters and automotive connectors to mainly the United States and Canada. Both these markets have been growing a lot in Chihuahua. Steel for construction, such as rebar, has grown due to the large number of high-rise buildings that have been built. Before 2010 there were only about ten of such buildings, now there are around 40. Our main differentiators are our service, professionalized business practices and our ERP processes. We have custom-made ERPs for our customers.

How diversified are the suppliers that Dalsa works with and do you agree there are too few suppliers of flat products?

We try to purchase our steel from the biggest suppliers in each industry. For example we work with Ternium who are the main suppliers of flat sheet iron and galvanized materials. Over the last ten to fifteen years, steel producers in Mexico have become a lot more globalized. At the same time, we also work with less globalized companies which sometimes offer more flexibility.

It is true that there are few players in the market but if you have too many players then the market gets flooded and the prices start to fall. Therefore, this is not a problem at present. Right now, the capacity is met by these companies.

How is Dalsa looking to expand?

We are planning to expand geographically and we have many choices about where we will go but we have not decided yet. First, we will focus on being stronger in Chihuahua where there are many newcomers trying to compete with Dalsa. The market has been growing at about 5% in terms of mt/y of steel sold and we have been growing at

about 25%. We are very performance driven and ambitious, whilst focusing on the client and offering a personalized service.

How do security risks affect the business environment in Chihuahua?

It has a significant effect, especially in places like Juarez where we have two offices. It is a challenge to our growth because it makes it difficult to approach new clients and it is a tough process to meet and talk to the head of companies. Although, this is not the case in Chihuahua City or Monterrey in Nuevo Leon. In the last five years the situation has been better than before. During the very bad years in Juarez, our business suffered by 50% as clients closed or did more business in the United States. Insurance for the transport of goods has become much higher as one in every hundred trucks is now robbed.

What are the main advantages of your logistics offering?

We spend a lot of money and time on logistics and track the GPS of every commercial truck that we have. Thanks to our ERP we can track and continuously analyze the time we spend from the moment of client purchase, to when goods are being loaded and delivery to the client. We can deliver from 6am to 8pm so have flexible hours of service.

What are your key objectives for the next three years and what has been your biggest achievement so far?

We have grown 25% per year without expanding our business but to grow further now we need to expand our number of stores in the next five years. It is usual to consider neighboring states to those that your company is located in but we do not see why we cannot focus on other states, especially as the country has become more connected by infrastructure. Whilst new projects like the New International Airport for Mexico City are an opportunity, recently there have been problems in the market in receiving payment from the government. A year ago we built a new store in Juarez which allowed us to grow significantly which has set the precedent for us to go after more growth. ■

Ana Karla Garza & Paul Capone

AKG: President

LOOPER

PC: Sales

KOSMOS LOGISTICS



AKG



PC

Looper provides multi-modal logistics solutions. Could you provide an overview of your capabilities and geographical reach?

PC: Looper is a 100 % Mexican logistics provider. We do a lot of inland and ocean freight and we can provide any kind of service for inland transportation and export and import. Kosmos, Looper's sister company, provides the same services but in the United States.

AKG: Our main industry at the moment is automotive in both the United States and Mexico, working particularly with clients in the Laguna region, Monterrey, Mexico City and the Bajío region. We also move products for the food, construction and oil and gas industries and are already moving materials for the Mexico City New International Airport (NAICM). We provide a full range of logistics services and can handle all different types of containers. We are a relatively new company but are already well established, with clients such as Neapco, Takata, Mylsa, Korean automobile companies and fabricators like Perfiles y Herrerajes.

Are you transporting any steel?

AKG: The main service we provide to the steel industry is the transportation of steel from the United States used by manufacturing industries in Mexico to make finished products which we then transport back to the United States. Mexico has a program called IMMEX which allows companies to import raw materials and export finished goods without paying extra duties. The automotive industry is growing very fast and it is demanding more of specialized steel produced in the United States. Nucor is producing much of the steel which the industry is buying.

We specialize in project cargo meaning big machines to entire production lines, which may require break-cargo services. Our main project in this area is for Perfiles y Herrerajes who fabricate steel in large amounts and are growing very fast. We also transport Mylsa's baskets to the Federal Commission of Electricity and all the machines for the Neapco's most recent plant located in Saltillo Coahuila Mexico.

Logistics costs in Mexico are twice as high as some other developed markets.

How challenging is Mexico's infrastructure to providing logistics services?

PC: It is quite challenging because of the cost of transportation. Petroleum is a high cost but labor is cheap which balances out the logistics costs somewhat. A key challenge is the condition of the highways, which can affect the time it takes to transport goods. This is problematic when we are committed to deliver goods from Monterrey to the US border in four hours, for example. The government must improve conditions of the roads. This was a major problem recently when the World Trade Bridge border crossing, the most used in Mexico, was damaged due to bad weather.

AKG: Costs are high compared to some other markets but the market is stable and the difference Looper provides is its service. Like every logistics company, we provide sea, inland and air transportation but unlike some other companies we are available 24/7. We are also constantly growing and improving our offering. All of our trucks have GPS and our clients can continuously see where their goods are through our online tracking system.

How has the new Mazatlán to Durango highway affected your business?

AKG: We have received many calls from the customs agency in the Port of Mazatlán asking us to incentivize our clients to use their port to import goods rather than the Port of Manzanillo. However, recently we analyzed the costs of shipping a container from China through both ports to Torreón and concluded that the cost of the Mazatlán route, despite being closer, was not very competitive. The dollars you save in inland freight using this port you spend on sea freight. Manzanillo's container capacity is very saturated and containers can sometimes take three to four days to import but Mazatlán is still a minor port, although it is growing.

What is your vision for Looper in the future?

AKG: A year ago we opened our US company, Kosmos, in El Paso, Texas. Our sales team is continuously travelling to visit locations in Mexico and next year we would like to open a representative office in Bajío and Monterrey to take Looper to the next level. ■



Mauricio Garza

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CEO
INTERPUERTO MONTERREY

Can you provide some background on why the Interpuerto Monterrey project was launched?

In the competitive global economy we have to strive for the best and logistics is a big part of that. Mexico's logistics costs are almost twice the level of developed markets. A key reason is the lack of infrastructure and therefore the shareholders of Interpuerto Monterrey saw an opportunity to provide a one-stop-shop for infrastructure connections. We are connected to Mexico's two main railway companies, Kansas City Railway and Ferromex, and are next door to Kansas City's container terminal as well as a four-lane highway to Laredo/Colombia Bridge.

Are there any particular sectors you are looking to attract to Interpuerto Monterrey?

We have 1,400 hectares with 85% availability which is suitable for practically any type of industry. Currently, we have automobile, logistics, food and steel companies. We are striving to attract three main sectors: logistics, automobile/ aerospace and steel manufacturers. We want new investments from the steel companies, who we can offer a good quality energy source with our own substation, as well as water and natural gas.

What other advantages are there to locating at Interpuerto Monterrey?

Our flexibility is a game changer. We can offer lots from one hectare to 500 hectares and three main real estate solutions: land sale, build-to-suit and speculative building leasing. A good indicator of Interpuerto's attractiveness is the expansion of companies' facilities at the site. Mondelez started with 140,000 square meters and now has 200,000 meters and steel pipe maker Tubacero has gone from 22,000 to 34,000 square meters. Tubacero was drawn to Interpuerto due to the rail connectivity in particular, which is not very available in Mexico. Additionally, our in-house customs facility should be fully operational next year. We also have a foreign trade zone where

companies will be able to import products without paying duties until they transform it into a final product for the domestic market. In the long term we want to be a binational custom operator where US custom agents are present at Interpuerto so companies can dispatch merchandise from the park directly to the United States.

Are there likely to be any changes to the foreign trade zone in any NAFTA renegotiations?

The potential failure of NAFTA will not have a great effect on trade. According to the World Trade Organization, average duties on Mexican exports to the United States that will be reverted to if the NAFTA collapses are between 2% and 5%, which is not highly significant. Also, because the Mexican peso has depreciated it will have even less of an impact.

The agreement is unlikely to be cancelled because the United States and Mexico are production partners. Of every product sent from Mexico to the United States, 40% of its components are made in the United States. Also, the United States' second largest export market is Mexico and it is the largest for twenty US states. NAFTA, the largest market in the world, is a win-win and trade is so integrated that taking it apart will be difficult. Moreover, the main reason for job losses in the United States is automatization. In fact, NAFTA has helped increase their exports. Also, their trade deficit with Mexico is 12% but with Japan it is 35% and China 60%.

What are your key priorities going forward and key milestones to your success so far?

We want to be the benchmark for industrial parks in Mexico. We are always trying to do something innovative and we need to listen to the market carefully. Developed countries are three steps ahead of Mexico so we have to be ready for companies from these markets. Defining moments are when we see our clients who we have sold the land to start producing and also when they recommend us to other companies. ■



Hugo Gonzalez

General Director

CORPORATION FOR THE DEVELOPMENT OF THE BORDER ZONE OF NUEVO LEON (CODEFRONT)

Could you provide a brief introduction to CODEFRONT's mission and main activities?

Our main objective is to make Nuevo Leon's 14 km border zone with the United States the best location for international commerce. As a commercial trademark, CODEFRONT is mainly known as the Colombia Bridge. We are part of the government of Nuevo Leon under the direction of the independent administration of Governor Jaime Heliodoro Rodríguez Calderón. CODEFRONT, the Secretary of Economic Development, Fernando Turner, and Governor Calderón have embarked on a new vision for CODEFRONT which focuses more on commercial areas.

To that end, we have brought in a new team from the private sector and have changed the mindset at CODEFRONT from political to commercial promotion. We will be closer to companies and more open-minded to the needs of industry.

Why should companies use the Colombia Bridge crossing as opposed to others?

First, time is money and our border crossings are in minutes not hours. Second, it has the high level of security. Third, we have very good relations with both US and Mexican customs officials. Last week we announced that Mexican customs will be handled on the US side which will save 50% to 60% of time. We are now the only inland port in the world to be ISO 28000 certified so we have a very good security management system.

We are also in the process of becoming a World Customs Organization authorized economic operator, becoming the only port of entry in the world to achieve this. Companies can save thousands of dollars every year from using our crossing. When the new team started two years ago, we had 1,200 vehicle border crossings every day for exports and around 1,000 a day for imports. Now we handle around 2,000 vehicles every day each for exports and 1,800 for imports.

What are the key challenges you face?

Mexico has been too focused on sea ports compared to inland ports and we also need to change logistics in Mexico based on technology. To move to Industry 4.0 Mexico needs better connectivity and CODEFRONT is therefore working to bring fiber optic communications from the United States to Nuevo Leon.

Do you have any plans to improve road or rail infrastructure near the port?

We are seeking 2.5 billion Mexican pesos from the federal government to build a new toll-free road from La Gloria to Colombia in Nuevo Leon and have submitted all studies that the Secretariat of Communications and Transportation of Mexico requires. Hopefully we will achieve this next year and if we do it will be a massive boost to international commerce.

What trends are you observing in the types of goods transported through Colombia?

Steel flows have been quite stable. There are more manufactured goods, especially automotive components. Also, there are more chemicals being transported, given that we are so secure we are certified to handle hazardous materials. More biodiesels and meat are also being transported. 40% of the meat coming from Canada by truck is transported by our bridge because it is faster and safer.

How concerned are you about NAFTA renegotiations and are you prepared for any eventuality?

Commerce will continue whatever happens. There is no way the US will not import avocados for the super bowl, tourists will stop visiting, or Nuevo Leon will stop exporting automobiles. The most important requirement for commerce will still be security, which we provide. We are launching a pilot project for companies to go through both US and Mexican customs on the US side which if it gets approval will mean commerce will never stop but actually increase.

What are CODEFRONT's most significant achievements?

We invited the US Food and Drug Administration to inspect livestock on the Mexican side enabling us to provide pre-clearance services, which has always been one of our goals. We have now been asked to provide this for other commodities. This led us to achieve the highest award in Mexico for logistics, the 'Tameme Award', becoming to first public entity to receive it. Also, we are very proud that through working with the Texas Department of Transportation and the municipality of Laredo we removed the toll from the road on the US side leading to Colombia Bridge. ■

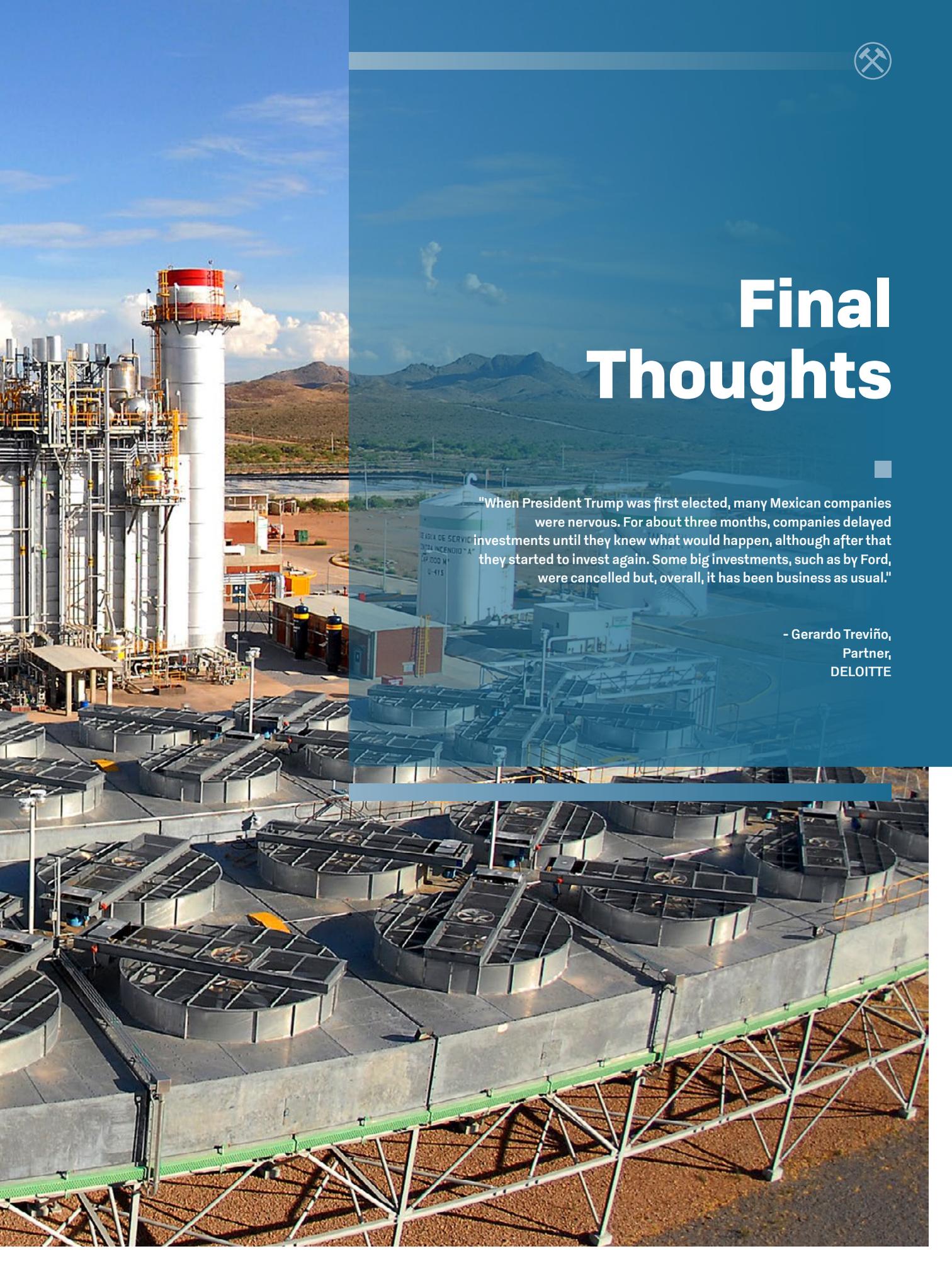




Final Thoughts

"When President Trump was first elected, many Mexican companies were nervous. For about three months, companies delayed investments until they knew what would happen, although after that they started to invest again. Some big investments, such as by Ford, were cancelled but, overall, it has been business as usual."

- Gerardo Treviño,
Partner,
DELOITTE



Gerardo Treviño, Carlos Lopez & Roberto Benevides

GT, CL & RB: Partners
DELOITTE



GT



CL



RB

With growth averaging over 2% in the last few years, how has this affected the steel sector?

GT: In the six years of President Peña Nieto's administration many reforms have been introduced but the economy has not been growing at a high rate. Nevertheless, companies have been performing well and we have observed a change in the economy; before it relied a lot on oil and gas but now our strongest industries are in manufacturing, in particular automotive. Whilst the internal market has been subdued, exports have increased, benefitting from Mexico's free trade agreements with many countries.

CL: In relation to steel, some companies have experienced difficulties due to currency fluctuations, especially those that have liabilities in foreign currencies. This is a problem because steel prices are denominated in dollars in Mexico, although many companies also sell steel in dollars which helps cancel out the effect. Some companies are vertically integrated and have raw materials in pesos, so they are in a slightly better shape. Two years ago the steel price was at its lowest level, but since then it has been increasing. It is expected to remain around its current level as China reduces production.

What trends have you observed in the production of steel in Mexico?

GT: Mexico is still a net importer of steel but companies are continuously producing more locally. Much of new production will substitute certain imports of value-added products.

CL: Specialty steel is sold at a higher price than commodity steel, whilst the fluctuation in price is also lower and margins are higher. This is also why companies are moving into this market.

How are the NAFTA negotiations affecting the business environment in Mexico?

GT: When President Trump was first elected, many Mexican companies were nervous. For about three months, companies delayed investments until they knew what would happen, although after that they started to invest again. Some big investments, such as by Ford, were cancelled but, overall, it has been business as usual. Companies believe there will be negative

effects but there will not be a big change. They are also looking at alternatives to the United States, such as other Latin American, European or Asian countries. Although NAFTA has been great for all three countries, including US automotive companies based in Mexico, executives are not as afraid as when Trump first got elected. Everything is so intertwined it will be difficult to destroy the trade relationships.

In the move towards specialty steels, how have companies tried to get closer to their clients?

GT: Nowadays, being close to your client is even more important. In the automotive industry, for example, if you want to sell even one mt of product, it is not easy as there are a lot of tests and stringent certifications. Probably you will have to send a sample to be assessed by a Tier 1 company. Then your steel mill has to be certified by an OEM. Therefore, companies are trying to be very close to their clients. Once you are in with a client, it is difficult to be replaced due to all the requirements.

CL: The market in Mexico used to be only based on price but now clients are also looking for quality and are able to pay a little more. Companies must have high efficiency and be prepared to produce products when the client needs them.

How do you see the outlook for Mexico's steel sector in the next two years?

CL: There has been an increase in capacity of wind energy, with projected investments in 2017 twice as large as 2016. After the government's power market reforms, many private investments have been made into electric generation plants, such as wind farms and co-generation plants, including those from steel manufacturers like AHMSA and Ternium. All of this creates a huge demand for steel. Construction is also expected to drive demand, as are pipelines for oil and gas.

GT: As a net importer, there are opportunities to substitute imports with domestic production. Relatedly, the industry has the potential to move into higher value-added products and the government's infrastructure plans, the new airport in Mexico City and other projects will also drive demand. ■



Demófilo Maldonado Cortés

Research Professor
**UNIVERSITY OF MONTERREY
(UDEM)**

What professional development programs does UDEM's Engineering Department offer to its students?

UDEM's Engineering Department has a partnership with Ternium, where people from the company across many different fields, including logistics, production, and maintenance, for example, come to lecture a specific class several times per semester. It is both an opportunity for students to learn about factory operations up-close, and it is also an opportunity for Ternium executives to meet prospective employees. This is a win-win situation for the school and for Ternium. Because of this relationship, many students have the opportunity to conduct thesis research at Ternium.

What particular innovations are UDEM students currently working on?

UDEM has a very strong relationship with Metalsa. Metalsa's main manufacturing process is deep drawing, which is used as a steel punching method. The main problem with the deep drawing process is friction and wear on the tools, which can be very expensive. We are currently working in a very specialized area of engineering called tribology. Our goal is to reduce the friction and wear on steel tools, and we have a new laboratory that is dedicated to this. Metalsa is helping us with our tribology program and with developing our knowledge of high-quality steel.

UDEM also has a partnership with Frisa Forjados. This company produces parts for wind mills and oil rigs, which both require special types of steel. They also recently built a new factory in Monterrey that specializes in high-quality aerospace steel that is intended for the hot forming process. This process involves a lot of friction and wear, so we are working on tribological applications for Frisa Forjados, as well. One particularly innovative application is laser cladding, which replaces welding with the use of lasers. The Mexican federal government just granted us US\$1 million to continue developing this technology as part of their Programas Educativos Interculturales (PEI) programs. Laser cladding not only results in much lower energy costs than welding, but also the surface finishing is much smoother after the process, resulting in a better product.

How advanced is robotics technology in

the steel production process?

Robotics technology is widely available and advancing very quickly. In addition to its tribological application, the laser cladding machine can also be used as a robotized 3D printer for steel. We keep this laser in a special chamber at Frisa Forjados' manufacturing plant because it is very expensive and can also be very dangerous. The 3D printing of steel is becoming a very large business because manufacturers can print only the pieces they require without special tools or moldings. We recently visited an Industry 4.0 event in Germany, and robotics were everywhere, even with farming equipment.

Where do UDEM's engineering students generally find employment?

Around 87% of our undergraduate students find employment within the first three months of graduation. The rest go directly into masters programs, many of which are abroad. Northern Mexico has a great need for engineers, and about 40% of our students receive job offers before they graduate. To make sure our students have well-rounded skill sets, we emphasize technical design in our curriculum. Whether students are focusing on robotics, electrical engineering, mechanical engineering, or something else, they should be well-versed in design. Design centers are growing a lot in Monterrey. If you have the ability to design, then you can learn how to manufacture. We also emphasize learning metal mechanical applications because Monterrey's industry offers an incredible number of employment opportunities around this.

How will the recent investments from Ternium and ArcelorMittal in Mexico affect the labor market?

A significant portion of these investments are related to automation, so UDEM is placing an emphasis on automation in its engineering curriculum, in addition to robotics. The best way to know how to prepare our students is to be in constant contact with companies like Ternium. We need to understand what their needs are so that we can provide our students with the right tools to add value and find innovative solutions for their problems. ■



Ricardo Haneine

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Managing Partner
AT KEARNEY
HISPANO-AMERICA

Could you please give an overview of AT Kearney's involvement with the Mexican manufacturing industry?

AT Kearney has continued to do work with the manufacturing companies in Mexico, specifically with the automotive sector. We are also heavily involved with the Ministry of Economy, as well as many private sector associations. Mexico is a net importer of steel, so we have repeatedly said that specialized steel for the automotive sector should be much closer to the plants. We feel that Mexico can add value to its manufacturing business by not importing certain components and manufacturing them ourselves.

What are the biggest challenges facing Mexican manufacturers today?

Mexico is in a good position with manufacturing in certain sectors. Mexico should continue to be a very strong manufacturing player. Some important technical disruptions happened in 2017. When you go to a Mexican manufacturing plant, they are typically very highly automated. We already have robots and integrated processes that work very well, but now the global trend is to completely automate everything, which the plants are still working on implementing.

The government aims to cut carbon emissions by 25% by 2030. What impact will that have on Mexican manufacturing?

Mexico's competitive advantage is not based on fossil fuels alone, so I do not perceive a negative impact on manufacturing. However, the different stakeholders will need to work together with the government on how to ensure the costs will still be worth the investment. There is a lot to do in terms of setting priorities for the current government to sustain Mexico as an elite player. Mexico has one of the oldest vehicles stock. It will be very expensive to reduce carbon emissions, but we have to consider this as an important transition phase. Everybody – all the different stakeholders – needs to play a role to help bury the costs.

What is your outlook on Mexican manufacturing for the future?

Mexico has a strong outlook. After the financial crisis, Mexico has been growing consistently in production, investment and has had positive economic growth levels. The country has had a very good economic environment in terms of monetary and fiscal policy, as well as its ease of doing business. That cannot be said for many of the other Latin American countries. Mexico is a fairly stable country, and our export manufacturing has been key. We have well developed clusters for manufacturing, and we are a consistent country to work with. Personally, I am very optimistic.

What factors could make Mexico's private sector more globally competitive?

Many times what counts in terms of competitiveness is not just Mexico as a whole, but the specific cities where we are most competitive. For instance, southern Mexico should really be more developed for Mexico as a whole to be a true competitor. Companies look at everything when they are looking to invest in a country. They look at factors such as having good schools for our kids, hospitals, security, and universities. We are hopeful that the new administration will be able to integrate more of our strengths with our less developed areas.

What do you think are the keys to Mexico's continued growth, regardless of who is in power after the upcoming election?

In Mexico, there is a clear trend where we are slowly decoupling the economy from the politics. I expect that there are sufficient mechanisms in place that would make the cost of going back on certain policies too high for any new politician. We need to make sure that the proper checks and balances are in place. We need a more developed institutional framework, and be inserted in the global economy in such a way that there are international rules with which we must comply. These factors are key for Mexico to continue to grow in a competitive and sustainable way. ■



Clark Chittenden

Head of Economic Team
**BRITISH EMBASSY
 MEXICO, FOREIGN AND
 COMMONWEALTH OFFICE**

Could you provide an overview of the work of the Economic Team in supporting trade between the United Kingdom and Mexico?

Essentially we look at economic policy and bigger picture issues in Mexico to ensure that through policy engagement there are more opportunities for UK companies. At the macro level, we look at issues like the European Union-Mexico Global Agreement negotiations and hold annual economic talks with representatives of the Mexican government. On the more micro side, we look at market access issues such as importation or non-tariff barriers. Another part of the work we do is through the 'Prosperity Fund', a new development fund launched by the British government for middle-income countries, like Mexico. By working with such countries on issues like regulation, helping to build capacity through the sharing of our own experiences, Britain can help with their economic growth and poverty reduction, as well as open up markets for increased competition.

How would you characterize the economic situation in Mexico at present?

In the context of its Latin American neighbors, Mexico is doing quite well, especially given the uncertainty caused by the NAFTA renegotiations, continued low oil price (although Mexico is no longer dependent on oil) and wider global events. The government's reform package has allowed Mexico to open up and diversify its economy, and soon we will see the benefits of this. We are already seeing this in the energy sector, for example, with a massive oil discovery at Ixachi-1 near Veracruz, which was made possible by an auction that a conglomerate of UK, US and Mexican companies won.

That said, there are areas where Mexico is looking to improve, such as productivity, innovation, and formalizing the economy and taxation. In addition, Mexico has corruption and rule of law challenges, like many countries. It is taking steps to address these and the new anti-corruption coordination systems are a very positive move.

What risks and opportunities does Mexico face in terms of the trade environment?

Mexico has based its economy on free trade and is a champion of it, similar to the

UK. This is one of the reasons the UK is so keen to improve its trade relationship with Mexico. The NAFTA renegotiations have been very political, but actually there is an opportunity, especially from Mexico's perspective, for it to be a win-win-win for all sides by improving conditions for trade. For steel, there are big opportunities in automotive, energy and infrastructure sectors. Generally, there are challenges around rules of origin, dispute settlements and sunset clauses, but Mexico wants to continue negotiating to find solutions.

All sides also want a speedy modernization of the EU-Mexico agreement. There is an obvious need for it to be updated given the last agreement, signed in 1997, did not include sectors such as e-commerce, nor key issues like integrity and anti-corruption. European countries want greater access to things like services and Mexican companies want better access for its agriculture.

Could you provide more details on the UK Prosperity Fund?

It is a government aid fund worth £1.3 billion which will be spent over six years in middle income countries to reduce poverty and boost growth. In Mexico it is geared towards helping the overall economy, improving the economic conditions of Mexicans, whilst opening up markets for international, including British, companies. The UK announced recently that it will spend £60 million over the next four years in Mexico focusing on energy projects, rule of law, future cities and financial services, with potentially health, education and trade programs to follow.

What opportunities do you see for British steel companies?

Britain's steel occupies a niche space in Mexico's industry, in particular in the automotive and aerospace sectors. There is a huge need for infrastructure in Mexico and the government's 2014 National Infrastructure Program projected combined public and private investments of around \$600 billion. This will mean much need for steel and other materials, where British companies can play a role. We are trying to encourage more British engineering and consultancy companies to come to Mexico and through the Prosperity Fund are working on a roadmap for infrastructure investments in the country, especially through public-private partnerships. ■

"During the very bad years in Juarez, our business suffered by 50% as clients closed or did more business in the United States. Insurance for the transport of goods has become much higher as one in every hundred trucks is now robbed."

**- Ing. Jorge Treviño Portilla,
General Director,
Dalsa**

"Industry 4.0 is the biggest technological challenge but also opportunity facing the steel industry. It will impact the entire production chain. The industry is ultra-competitive and cost-cutting is a major driver, as is quality over quantity, both areas where Industry 4.0 solutions can add a lot of value."

**- Karl Purkarthofer,
Senior Vice President,
Global Head of Metallurgical Services,
Primetals Technologies**

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"Given the high degree of integration and interdependence we have with the United States and Canada, North America will continue to be our main market. We are not seeking to change that, nor do we believe that doing so would be convenient given the range of competitive advantages we have built together over decades."

**- Paulo Carreño King,
CEO,
ProMéxico**

"The flat products market is an oligopoly consisting of ArcelorMittal, AHMSA and Ternium. ArcelorMittal used to only produce slabs which were used as raw material by Ternium. However, Ternium this year bought ThyssenKrupp's assets in CSA Siderúrgica do Atlântico so they are now self-sufficient in slabs. However, one of the SEZ is in Lázaro Cárdenas, Michoacán, where ArcelorMittal has its facility. Therefore the SEZ policy will benefit ArcelorMittal."

**- Francisco Pontón,
Director General,
Steel Warehouse Mexico**



"In the competitive global economy, we have to strive for the best and logistics is a big part of that. Mexico's logistics costs are almost twice the level of developed markets"

**- Mauricio Garza,
CEO,
Interpuerto Monterrey**

"Commercial construction by private investors is driving growth in the Mexican economy and this is a big opportunity for our company. Making business with private companies is also easier than with the government."

**- Jose Luis Vargas,
General Director,
Harsco Industrial IKG**

"One of the main challenges is compliance. The Mexican government has set a lot of hurdles for Mexican businesses in general, but particularly for recycling businesses. The main reason we do not collect street scrap is because of the tax implications and financial hurdles required to do so."

**- Jorge Zambrano,
CEO,
Zimmer Recycling**

"Mexico's business climate is becoming more solid. According to the World Bank's Doing Business 2018, Mexico increased its rating to 72.27 (0.18 points more than in 2017). With this result that positions Mexico in 49th place out of 190 economies, Mexico is considered to be the best country to do business in Latin America."

**- Paulo Carreño King,
CEO,
ProMéxico**



ABP INDUCTION



ACEROTECA
MÉXICO



GRUPO AMERISTEEL

S.A. de C.V.

Eficiencia en Acero Estructural

COMPANY/ INSTITUTION

WEBSITE

Government and Sector Bodies

Asociación Latinoamericana del Acero (Alacero)	https://www.alacero.org/
Association for Iron & Steel Technology (AIST)	http://aistmexico.org.mx/
Cámara Mexicana de la Industria de la Construcción (CMIC)	http://www.cmic.org/
Cámara Nacional de la Industria del Hierro y el Acero (Canacero)	http://www.canacero.org.mx/en/
Cluster Automotriz de Nuevo León (CLAUT)	http://www.claut.com.mx/
Colegio de Ingenieros Civiles de México (CICM)	http://cicm.org.mx/
Industria Nacional de Autopartes (INA)	https://www.ina.com.mx/
ProMéxico	http://www.promexico.mx/
Secretariat of Economy, Mexico	https://www.gob.mx/se/acciones-y-programas/industry
Secretariat of Economy, Nuevo Leon	http://business.nl.gob.mx/

Steel Producers and their Service Providers

Altos Hornos de México (AHMSA)	http://www.ahmsa.com/
ABP Induction Systems	http://www.abpinduction.com/
ArcelorMittal México	http://corporate.arcelormittal.com/
BRC Global Rolls	http://www.brcil.com/about
Cryolnra	http://www.autlan.com.mx/?lang=en
Deacero	http://www.deacero.com/en/
Gerdau Corsa	https://www.gerdau.com/gerdaucorsa/es/home
Minera Autlán	http://www.autlan.com.mx/?lang=en
Prmetals Technologies	https://www.primetals.com/
Roberts Sinto	https://robertssinto.com/
Roca Acero	http://www.rocaacero.com.mx/index.php?lang=en
TenarisTamsa	http://www.tenaristamsa.com/
Tenova HYL	https://www.tenova.com/about-us/who-we-are/tenova-hyl/
Ternium	http://www.ternium.com/
TIM Novametal	http://www.novametal.com/about-us/
Villacero	https://www.villacero.com/
Zimmer Recycling	http://www.zimmer.com.mx/en/

This list intends to include just a representative sample of companies operating in the Mexico Steel and Iron sector, and as such it should not be considered a guide to take investment decisions.

COMPANY/ INSTITUTION

WEBSITE

Distributors, Service Centers and Logistics

Aceros del Toro	http://www.acerosdeltoro.com/
Aceroteca	http://www.aceroteca.com/?lang=en
Dalsa	http://www.dalsa.mx/
Ferrecabsa	http://ferrecabsa.com/
Galvaprime	http://galvaprime.com/
Grupo Mim	http://www.grupo-mim.com/
Plesa Steel	http://www.plesa.com.mx/
Roca Acero	http://www.grupo-mim.com/
Tycsacero	http://tycsacero.com/
Ventacero	http://www.ventacero.com/#&panel1-1
Construction	
Acciona	https://www.acciona.com/
Estructuras Solana	http://solana.mx/
Fabestructuras	http://ffesa.com/
Grupo Ameristeel	http://grupoameristeel.com/home.php
Grupo Tauro	http://www.grupotauro.com/en/home.html
Harsco	https://www.harsco.com/
Mabey Bridges	https://www.mabey.com/int/en

Automotive

AAM Casting	https://www.aam.com/home
ATC Automation	http://www.automationtool.com/
Blackhawk Mexico	http://www.blackhawk.com.mx/013/index.htm
ERM	https://www.erm.com/en/locations/mexico/
Grupo Quimmco	http://quimmco.com/home
Metalsa	https://www.metalsa.com/

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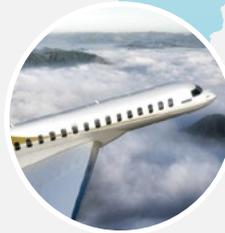
Cluster Automotriz de Nuevo León (CLAUT)

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