

MEXICO

AUTOMOTIVE REVIEW



HIGHLIGHTS 2017





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MEXICO

AUTOMOTIVE REVIEW 2017

Despite grim projections for the Mexican automotive industry at the end of 2016, the sector remains in good shape, slower perhaps but on track for greater growth. Even after a couple of months of uncertainty, the sector has maintained its position as one of the top drivers of the national economy. The world's seventh-largest light-vehicle manufacturer and third-largest exporter, Mexico has a strong opportunity to keep climbing the ranks and to overtake India as the sixth-largest manufacturer by 2018. Companies remain confident in the country's development and investment continues to pour in from traditional foreign sources such as Germany and Japan, as well as from newcomers such as South Korea and China.

The industry's challenge is to address its main areas of opportunity to maintain its competitiveness. Talent remains a concern, especially considering the increasingly technological nature of the automotive sector. Local supplier development also worries investors and industry leaders who expect the industry to grow its added value and boost Mexico's position beyond a low-cost manufacturing hub. Experts see collaboration between the industry and the government as a key point to ensure success both in talent and supplier development.

Mexico Automotive Review 2017 addresses these issues along with success stories, new projects and other areas of opportunity and investment that industry leaders have identified in the past year. Through 14 chapters, Mexico's automotive industry, from top to bottom, is brought to light.

YEAR IN REVIEW

Record sales and production marked the latter half of 2016 but a slowdown set in during the first half of 2017, marked by shrinking sales of light vehicles in the key US market. Uncertainty marked the previous 12 months, with the renegotiation of NAFTA spurring the country to cast an eye at alternative markets for growth

As 2017 heads into the final stretch, Mexico retains its position as the seventh main light-vehicle manufacturer in the world but it has climbed up the ranks in terms of exports. In 2016, the country moved up one position to become the third-ranked light-vehicle exporter globally, behind Germany and Japan. The automotive industry represents approximately 3 percent of Mexico's GDP and 18 percent of its manufacturing GDP.

Data for 2016 show Mexico achieved record numbers in terms of production, exports and sales of light vehicles. By the end of the year, production accounted for 3.47 million vehicles, representing a 2 percent increase compared to 2015. Of these, 2.77 million were exported, a rise of 0.3 percent year on year. With the arrival of Kia and Audi, not only did the country move up the international rankings, it also became the main vehicle exporter to the US.

In the domestic market, sales jumped 18.6 percent to more than 1.6 million units. Numbers from January to July 2017, however, suggest a slowdown is in progress. Production and exports are exhibiting the strongest growth at 10.8 percent and 13.1 percent, respectively. Kia continues to ramp up its production and according to Eduardo Solís, Executive President of AMIA, other automakers have finalized platform updates that were the main cause of moderate production growth in 2016. Sales have only grown 1.4 percent between January and July 2017 compared to the previous year when they reached a total 853,620 units. Solís and Guillermo Prieto, Executive President of AMDA, agree that the most likely outcome for the domestic market will be moderate single-digit growth for 2017 of no more than 5 percent. Unlike its lighter counterpart, production in the heavy-vehicle segment plunged 21 percent in 2016, totaling 150,889 units, due to lower demand in Mexico's main export markets, which Miguel Elizalde, Executive President of ANPACT, expects will continue, leading to a further 20 percent production decline in 2017.

PRODUCTION

The Mexican automotive industry comprises 23 light-vehicle and 15 heavy-vehicle production plants in operation, distributed across North Baja California, Sonora, Chihuahua, Coahuila, Nuevo Leon, Aguascalientes, San Luis Potosi, Guanajuato, Jalisco, Queretaro, Morelos, the State of Mexico, Puebla, Hidalgo and Veracruz. After two years of planning, Mexican innovator VUHL opened its MX\$65 million (US\$3.7 million) plant in Queretaro, where it plans to manufacture 25 cars per year. Grupo Bimbo's subsidiary

Moldex is also expanding its vehicle production outside Bimbo's borders and will now produce electric vehicles for the national market in collaboration with billionaire Carlos Slim's Giant Motors at its plant in Hidalgo. In terms of foreign investment, along with the entrance of Kia and Audi, Mexico attracted Chinese OEMs looking to target the Latin American market and eventually the NAFTA region.

In collaboration with Giant Motors, in which Slim's Grupo Inbursa is a 50 percent owner, the Chinese brand JAC will begin manufacturing two SUVs at Giant Motors' plant in Hidalgo. JAC has invested MX\$4.4 billion (US\$249 million) and production is expected to begin in 2018. A collaboration between Grupo Picacho and the Chinese maker BAIC also resulted in a new manufacturing project. Originally a distribution deal, Picacho and BAIC's relationship transformed into a production venture. BAIC started manufacturing its vehicles at truck manufacturer Foton's plant in Veracruz in April 2017.

Three more light-vehicle plants are expected to start operations no later than 2019. The Renault-Nissan Alliance in collaboration with Daimler is now building the COMPAS project in Aguascalientes, which is scheduled to begin operations by the end of 2017. The project will start with production of INFINITI models and will integrate Mercedes-Benz vehicles into the production line in 2018. BMW's venture in San Luis Potosi is projected to start in 2019. The project is under construction but the company expects to have an annual production of 150,000 units of its Series 3 model when the plant comes online. Toyota also has a new plant in the works, scheduled to begin producing in 2020. The company's facility will be located in Guanajuato and will focus on production of pickup models.

AMBITIOUS GOALS

Despite an expected slower growth pace in 2017, Mexico has ambitious goals regarding production and development of the domestic market. According to Solís and Prieto, the country's target for 2020 is to achieve production of over 5 million vehicles and domestic sales of 2 million units. Mexico seems to be on track for both targets although there are factors that could potentially present a risk to meeting these goals. The first consideration is the evolution of the international vehicle market. Due to the plunge in oil prices starting in July 2014, the market began favoring larger vehicles thanks to lower gasoline prices. In July 2014, the prices of a barrel of WTI mix

peaked at US\$102.4 but then reversed fortunes until reaching its lowest point in February 2016 at US\$30.6. Since then, the mix has regained strength but it is still below half of what it cost in 2014, sitting at around US\$45 at the end of June 2017. According to Solís, Mexico's production is highly dependent on the behavior of the US and Canadian markets and in both, demand is intricately linked with oil prices.

Solís does not seem concerned, however. "Although there is currently a preference toward larger vehicles and SUVs in the US, I would not expect Mexican plants to shift their production toward these models," he says. Nevertheless, the country has already tasted its first disappointment due to receding demand for compact vehicles in the US. After canceling its investment in San Luis Potosi, Ford announced that its projected production of the new Focus would be relocated to its existing plant in Hermosillo. However, the company issued a statement in June saying that the company would transfer its production to China in an effort to further reduce costs. According to a statement from Joe Hinrichs, President of Global Operations at Ford Motor Company, the company will save US\$1 billion by moving its operations to China, liberating budget to invest in its light-truck plant in Kentucky and new projects related to autonomy and electrification.

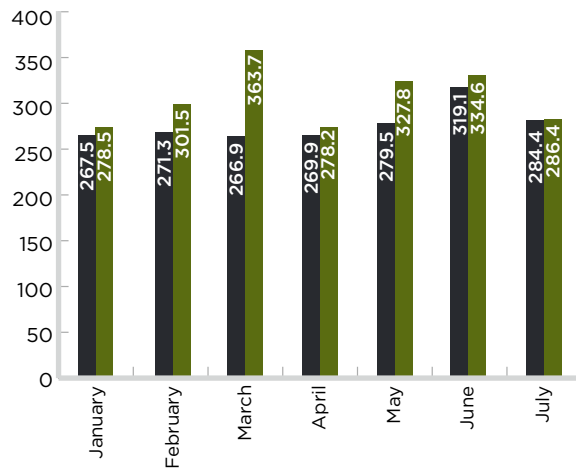
THE TRUMP CARD

Since 1997, Mexico's inflation rate has dropped steadily, maintaining below 5 percent since 2010 and hitting an all-time low of 2.72 percent in 2015. According to estimates from the International Monetary Fund and the World Bank, Mexico's GDP grew 2.2 percent in 2016 to US\$1.17 trillion. In its report *The World in 2050*, PwC forecasts that Mexico could grow at an inter-annual rate of 3.8 percent up to 2050. While the long-term outlook remains relatively unchanged, the economy in the short term has been hit by uncertainty in the wake of Donald Trump's rise to the US presidency.

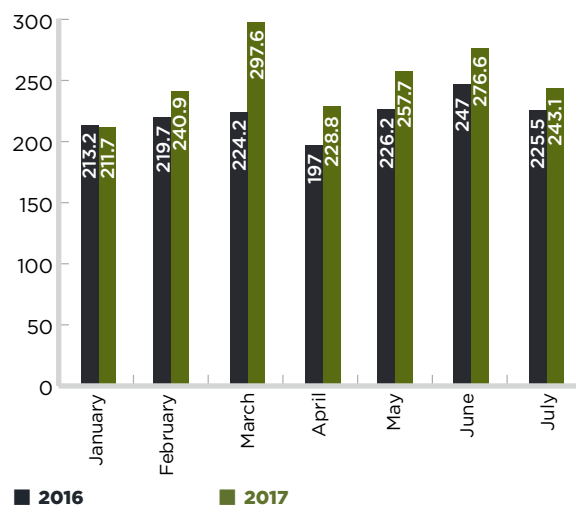
Trump started targeting the Mexican manufacturing industry in the second half of 2015, declaring that Mexicans were stealing jobs from the US. The rhetoric intensified in the last quarter of 2016 when prior to the US elections, Trump began to attack automotive companies directly via Twitter. His premise was that given Mexico's unfair trade balance with the US, the ideal measure would be to slap a 35 percent tariff on vehicle exports coming from Mexico. The result was a wave of uncertainty among companies with manufacturing operations in the country. However, as a renegotiation of NAFTA moves forward, the Mexican government has stood its ground against Trump.

According to a survey conducted by Mexico Automotive Review 2017 with 184 executives of the national industry, uncertainty remains the main factor hindering companies' competitiveness. Still, growth projections for Mexico

LIGHT-VEHICLE PRODUCTION (thousands of units)



LIGHT-VEHICLE EXPORTS (thousands of units)



Source: AMIA

THREE SCENARIOS FOR LIGHT-VEHICLE SALES IN 2017 (millions of units)

	Sales	Growth
Most plausible	1.69	6%
Most optimistic	1.77	11%
Most pessimistic	1.33	-17%

Source: AMDA

are positive. According to Fitch Ratings' latest review on Mexico's perspective, the ratings firm has awarded the country a BBB+ mark, with an upgrade to "stable" from "negative." According to a statement from the firm, "the risk of a negative scenario that could affect the competitiveness of Mexico's exports is reduced now that the US seems to be taking a moderate position regarding the renegotiation of NAFTA."



PRIORITIES FOR MEXICO'S TRADE RELATIONSHIPS

ILDEFONSO GUAJARDO

Minister of Economy

Q: How will Mexico take advantage of the renegotiation of NAFTA to boost the country's manufacturing competitiveness in the auto industry?

A: The automotive industry in North America is a key driver of economic growth, job creation and global competitiveness for the region. There is the possibility to assess if we can enhance NAFTA's competitiveness by increasing the region's value add. Nevertheless, such an evaluation should be based on the importance of preserving the integration achieved over the past 23 years among the sector's value chains and which has promoted cost-effective production for automakers in all three countries. Mexico and its NAFTA partners can explore additional means to increase competitiveness by collaborating on safety standards, infrastructure improvements to border facilities and by streamlining customs procedures.

Q: What strategies is the Ministry of Economy following to ensure that Mexico remains a competitive destination for FDI despite international uncertainty?

A: Mexico is one of the most open economies to international trade and investment. The structural reforms carried out by President Enrique Peña Nieto's administration have helped attract domestic and foreign investment in strategic sectors. Specifically, the Ministry of Economy has implemented several actions to simplify doing business in Mexico. First is the easing of regulations to facilitate investment in sectors where FDI was previously restricted. Second is increased accessibility and transparency of the Public Registry of Commerce and Property. Third is the creation, with the support of Congress, of a new corporate figure called Simplified Joint Stock Company, which allows for the creation of an online business at no cost and at any time when annual income is below MX\$5 million. Finally, the use of electronic platforms to ease processes related

to FDI registry, as well as access to the required national standardization procedures and applicable standards or technical regulations.

Q: What are the government's priorities regarding the establishment of commercial agreements with Asian and Latin American countries?

A: The Asia-Pacific region is a priority for Mexico. Over the last four years, we have followed different routes to strengthen the country's commercial ties with these countries. In late 2012, Mexico joined TPP negotiations. However, since TPP's entry into force is uncertain, Mexico is exploring additional paths to approach the region. For instance, in March 2017 in Viña del Mar, Chile, the Pacific Alliance established the "associate state" category, with the goal of signing trade agreements with Asia-Pacific countries, mainly targeting other TPP hopefuls. Within the framework of APEC, leaders of the Pacific Alliance engaged in dialogues with Asian economies in which they explored common cooperation areas, namely SMEs and trade facilitation.

Q: What strategies is the government planning to implement to help companies diversify operations outside the US?

A: President Peña Nieto's administration expects to diversify Mexico's trade agenda with potential markets and deepen our integration with existing partners. We are modernizing our trade agreements with both the EU and the European Free Trade Association countries. In Latin America, we are deepening the existing agreements with Brazil and Argentina.

Q: How is the Ministry working to boost the presence of Mexican companies abroad?

A: ProMéxico serves as a useful platform to help internationalize Mexican companies. It provides them with assistance to identify the most suitable export or foreign investment opportunities through market studies and accompanies them through the process, from packaging, labeling and brand registration, to finding legal advice across the border. ProMéxico also develops promotional activities to help position Mexican products abroad, such as missions, fairs or seminars, which help them enhance their growth.

Ildefonso Guajardo was appointed Minister of Economy by President Enrique Peña Nieto on Dec. 1, 2012. Originally from Monterrey, Guajardo has also served as President of the Economy Commission and was a member of the Ministry of Finance

THE GOALS OF THE MEXICAN AUTOMOTIVE INDUSTRY

EDUARDO SOLÍS

Executive President of AMIA



Q: What are your growth projections for Mexican manufacturing operations based on 2016's results?

A: The goal for 2017 is to manufacture 3.5 million vehicles. During the first three months of the year, production rose 17.1 percent, mainly fueled by the incorporation of new manufacturing facilities from Kia and Audi. In addition, several plants increased production compared to last year when production was hampered by the reduction in vehicles produced as some OEMs switched vehicle platforms. Production is closely linked to Mexican export destinations. Although there is currently a preference toward larger vehicles and SUVs in the US, I would not expect Mexican plants to shift their production toward these models. Mexico is mainly focused on manufacturing compact vehicles and switching platforms to incorporate larger models is a complicated process.

Q: What successes has the National Group of Academic Institutions and Research Centers achieved?

A: The group, created in 2015, has already yielded successful results from collaborative research projects. Research centers with a focus on automotive applications are now participating in the development of a Mexican demo car. This vehicle will need to comply with three characteristics: it has to be electric, connected and autonomous. We will organize an innovation workshop with 850 students to generate proposals that incorporate these features.

The group has been an excellent catalyst for boosting collaboration between public research centers managed by CONACYT and CINEVESTAV, as well as private centers from OEMs and suppliers. Collaboration on engineering and innovation projects is essential for the Mexican industry to develop and there is much excitement and high expectations for the success of this venture. UNAM, IPN, ITESM, Anahuac, the People's Autonomous University of Puebla (UPAEP) and the Autonomous University of Nuevo Leon (UANL) are among the academic institutions participating in the group. Universities and research centers are supported by the Ministry of Economy, the Treasury, the Ministry of Public Education, the National Council for Standardization and Certification of Labor Competences (CONOCER) and ProMéxico.

Q: What opportunities do you see regarding financing, considering its importance to growing domestic sales?

A: Financing has played a crucial role in the domestic market's development. Almost 70 percent of all vehicles sold in Mexico are bought through a loan. The international benchmark for financing is 85 percent, which means there is still room for growth. Longer payment terms are becoming more attractive for clients and financing institutions, and both banks and multiple-purpose financial institutions (Sofomes) are promoting these terms as a sign of certainty in the development of the domestic market and in Mexico's economic situation.

Q: What impact do you expect Chinese newcomers like BAIC and JAC will have on competition in the domestic market?

A: It is still uncertain what kind of impact these companies will have. What remains true is that all commercial directors are implementing strategies to maintain and grow their current market share. We are already in contact with both BAIC and JAC, which are not yet members of AMIA.

Q: What are your projections for electric vehicle sales, especially after the increase in gas prices?

A: We expect to see more and more of these vehicles on the streets, especially after the increase in gasoline prices, but fiscal or technological breakthroughs are still needed before Mexico sees a drastic increase in demand. Right now, there are almost no incentives to purchase and use electric vehicles, unlike in other places like California, where clients receive a US\$7,500 incentive from the federal government plus US\$2,500 more from the state government. These incentives are necessary because costs related to these vehicles are still too high. Batteries remain too expensive but as soon as the technology becomes more affordable, governments will no longer have to resort to financial compensation for clients.

The Mexican Association for the Automotive Industry (AMIA) is a civil association formed in 1951 with the goal of representing the interests of vehicle manufacturers established in Mexico



THE VISION OF INTELLIGENT MOBILITY

MAYRA GONZÁLEZ

President and Managing Director of Nissan Mexicana

Q: Mexico is Nissan's fourth most important market globally. How will the company maintain its growth here?

A: After eight consecutive years of being the leading brand in Mexico and with a market share of 25 percent during our 2016 fiscal year, our goal is to continue with our winning formula. Our latest target is to surpass the 406,995 units sold in FY16, which is a record in itself because no other brand has managed to sell that many vehicles in Mexico in a single fiscal year. Nissan's innovative approach has been one of the pillars of the company's success, with a strong vehicle portfolio that allows it to participate in almost all market segments. Our manufacturing operations have also helped to strengthen our presence in the country and to offer competitive prices to our clients. We now have two plants in Aguascalientes, another in Morelos and we will open our fourth plant, also in Aguascalientes, by the end of 2017.

Q: How will Nissan's recent acquisition of 34 percent of Mitsubishi's stock boost the company's position in the global market?

A: Mexico has not yet defined a new model for how Nissan's, or even Mitsubishi's, operations will change but globally this acquisition will only strengthen the alliance between Renault-Nissan and now Mitsubishi. After we acquired 34 percent of Mitsubishi's stock, the alliance became the third most-important automotive group in the world. The alliance sold over 10 million vehicles around the world during the first half of 2017. The three companies complement each other and I think the best of this venture is yet to come. We still need to define how each company will take advantage of the others' manufacturing infrastructure, supply chain, distribution network and technology. Negotiations on how the new alliance will impact each country are ongoing but Carlos Ghosn, Chairman and CEO of the Renault-Nissan Alliance, says the addition of Mitsubishi could transform the alliance into the most important automotive group in the world.

***Nissan Motor Corporation** is a unit of the Renault-Nissan Alliance. The company is the largest OEM in Mexico with sales of over 400,000 units in 2016 and four manufacturing plants, three of which are focused on Nissan models and one on INFINITI vehicles*

Q: What role does Mexico play in Nissan's global manufacturing footprint?

A: We manufacture a new vehicle in Mexico every 34 seconds and our production line in the Aguascalientes' A1 plant is flexible enough to incorporate five different models in the future. Mexican manufacturing has become a corporate standard for our global operations, having attracted US\$5 billion in investment from Nissan since 2007. Aguascalientes was the first location to manufacture the Nissan Kicks crossover with an investment of US\$150 million. This model allowed us to compete in a market segment that we had not explored in our 53 years in Mexico. Now we can proudly say that so far, in the current 2017 calendar year 2017, we are leaders in the small crossover segment as well.

Q: How is Nissan transforming its value proposition to incorporate global automotive trends?

A: The Nissan Tsuru was a flagship model for Nissan in Mexico. We manufactured a total of 2.4 million Tsuru vehicles until production stopped in May 2017. Its sustained success was thanks to it representing a reliable and affordable mobility solution for the Mexican population. But after three decades, we decided it had accomplished its mission. We hope to satisfy consumers with the entry versions of the Versa, March and Tiida models.

Nissan is now moving on to a new era driven by Intelligent Mobility. Terminating the production of Tsuru was the first step we took into this new era. We sold 1,000 units of a commemorative edition and followed with the launch of the new Nissan GT-R in May 2017, when we formalized our promise to the public to provide innovation and exciting driving experiences. Our new mission is to revolutionize mobility globally through three principles. The first, Intelligent Driving, will focus on how to incorporate new technologies to make driving much more efficient and eventually autonomous. Intelligent Power, the second cornerstone of our new initiative, will guide Nissan on the use of alternative-energy sources. Finally, Intelligent Integration will create connectivity between vehicles, the Cloud and road infrastructure. These three branches of Intelligent Mobility are the key to reaching our Double Zero target of zero emissions and zero road fatalities.

INDUSTRY 4.0 A REALITY IN MEXICO'S LATEST OEM PLANT



ALFONS DINTNER

President of Audi México

Q: Why did the company choose San Jose Chiapa, Puebla for its plant and supply chain over more industrialized areas?

A: We did a lot of research before establishing facilities in Mexico. San Jose Chiapa, Puebla offered us the freedom to build our plant how we wanted. We visited several industrial parks in the country but none offered us the same possibilities to work according to the Audi Production System. This location is also excellent for logistics, with a direct connection to the Atlantic and the Pacific through rail infrastructure. The existing supplier network was another advantage. Most importantly, the people in Puebla are well-educated.

Producing premium quality cars with is not a big challenge for us. The Audi Production System has set global standards that have allowed us to efficiently build our operations in Mexico. The real challenge we found when we arrived in San Jose Chiapa was that there was little infrastructure. It was hard for our people to build something from scratch in this environment but they knew why this project was important and how it would benefit Audi. We received lots of support from our colleagues at Volkswagen in Puebla city and the Mexican authorities put the right infrastructure in place for us to establish the newest smart factory in the Audi production network.

Q: How is Audi innovating to incorporate Industry 4.0 practices in its new plant?

A: It can be hard to translate technology from theory to practice but our plant in Mexico is an example of how Industry 4.0 can be integrated right from the construction of the plant itself. We built our facility in San Jose Chiapa in record time and before we moved all our manufacturing equipment to our body shop, we modeled the facility on a computer. We projected that same model onto the production floor with a laser, so our team knew where each machine should be and how to secure it to the floor. We projected the arrangement of 670 robots plus a number of connecting conveyor belts for our body shop and every interconnection between machines was already digitally mapped beforehand. In the end, instead of isolated work modules, we had a completely interconnected construction and later manufacturing system.

Production is monitored through our control center and vehicles are traced with radio frequency identification (RFID) antennas. All manufactured cars are traced during each step of the process; the computer knows the model and color of the car, its features and destination. The system displays which machines are operating and information on any piece of equipment in the factory, all in real time. Our logistics, manufacturing and IT experts work together in the control center to determine how the plant is running and where potential improvements can be made. Some of our suppliers already send their components with RFID tags, so we can be sure that everything is on its way and gets to the right place at the right time. The information we gather from the control center is also available to our suppliers, so we can perfectly manage just-in-sequence operations with our partners.

Q: How have Audi's advances shaped the company's goals for 2017?

A: We have incorporated the latest manufacturing technology into our production site in Mexico, including a new welding process to fuse steel and aluminum. Our operations have advanced as planned. We started our production on Sep. 30, 2016 with vehicles destined for the European market. As the level of individualization in Europe is very high, this was a challenging task. All features and equipment available resulted in high complexity right from the start of production. We successfully managed the project and delivered the planned volume for the market launch on time. Our next target for 2017 was to produce vehicles for Mexico, the US and Canada. So far, we have received excellent feedback regarding the quality of our products. The launch in Mexico took place in February 2017 and for the US in April. In addition to the Q5, we are also manufacturing the SQ5 and will soon start with the hybrid variant of our Audi Q5 in Puebla. Altogether, we expect to produce 150,000 vehicles per year.

Audi is a German premium automaker founded in 1909 that is now part of the Volkswagen Group. The company's headquarters are in Ingolstadt, Germany, and it has specialized production sites in Hungary, Belgium, India, China, Brazil and Mexico

BOOSTING COMPETITIVENESS FOR NATIONAL GROWTH

The Ministry of Economy has outlined its priorities to boost the image of the national automotive industry but executives think there are other factors that are equally, if not more important, to ensure international competitiveness and decrease Mexico's dependence on a single market

Although one of the main advantages foreign investors highlight about Mexico is its proximity to the US, many of the 184 executives surveyed by Mexico Automotive Review 2017 say that Mexico's dependence on the US is one of the country's main obstacles. Mexico's FTAs with 45 countries, excluding NAFTA, open the door to many more business opportunities

and executives are realizing that. However, to increase its competitive value, the country must also address some internal issues. Security, talent availability and a strong local value chain are among the priorities for Mexico's executives, along with a plea for legal certainty from the government when doing business or establishing new operations.

THE AUTOMOTIVE INDUSTRY'S DEVELOPMENT IS BASED ON FOUR PILLARS ACCORDING TO THE MINISTRY OF ECONOMY:



A strong FTA network with over 45 countries



The promotion of engineering and R&D activities



A human capital-oriented strategy

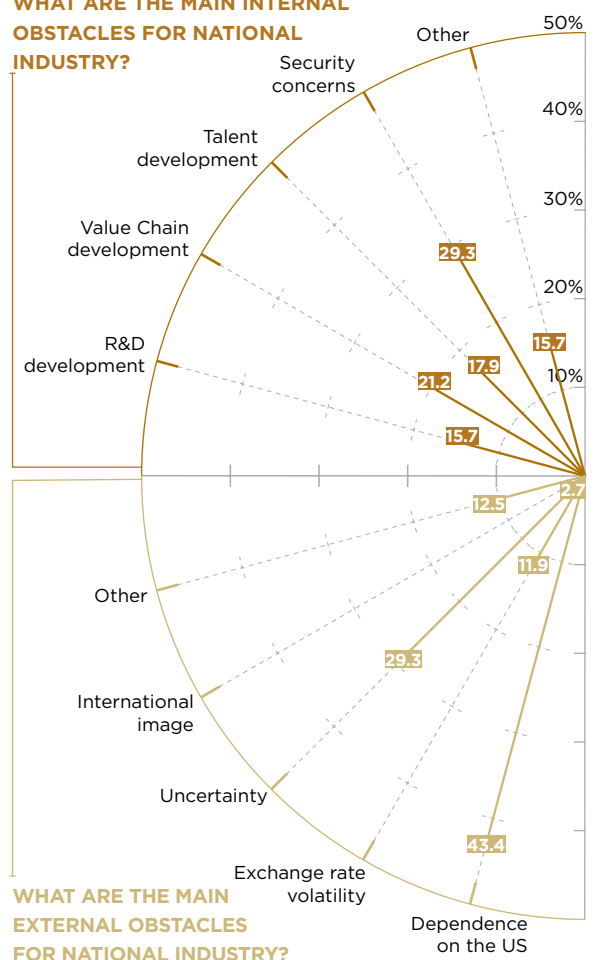


The Energy Reform

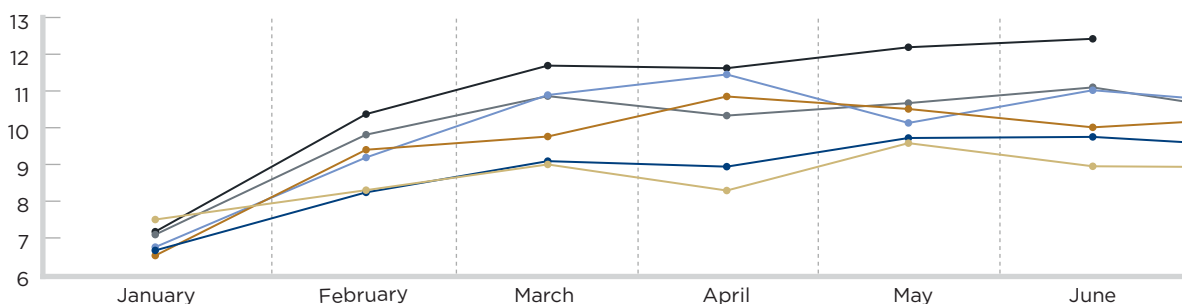


Each year, **Mexico** produces over **100,000** engineers

WHAT ARE THE MAIN INTERNAL OBSTACLES FOR NATIONAL INDUSTRY?

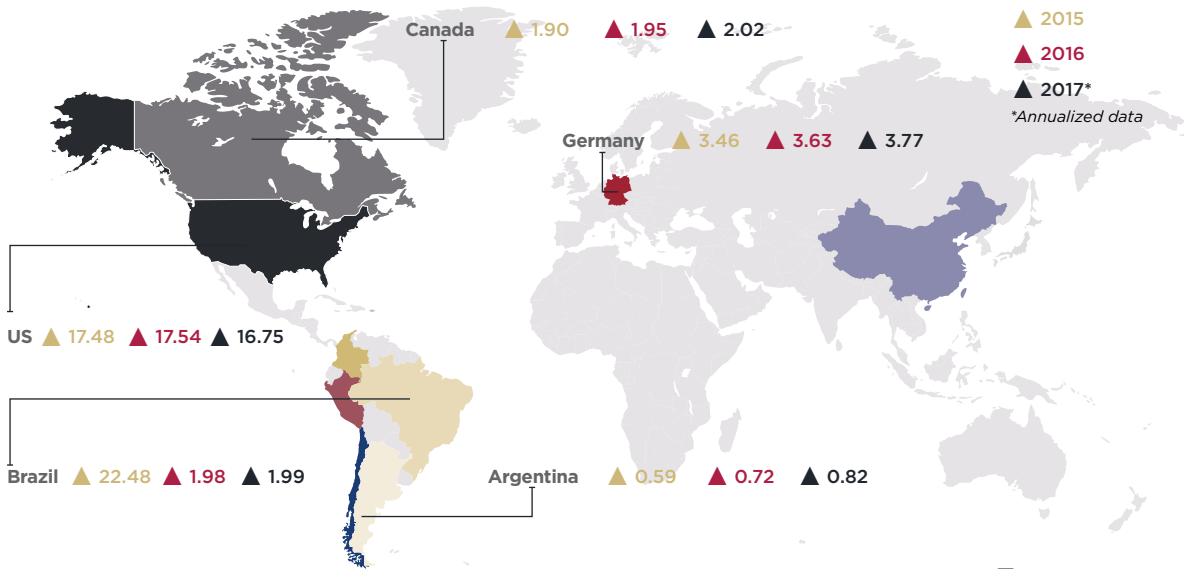


MEXICO-US TRADE BALANCE (US\$)

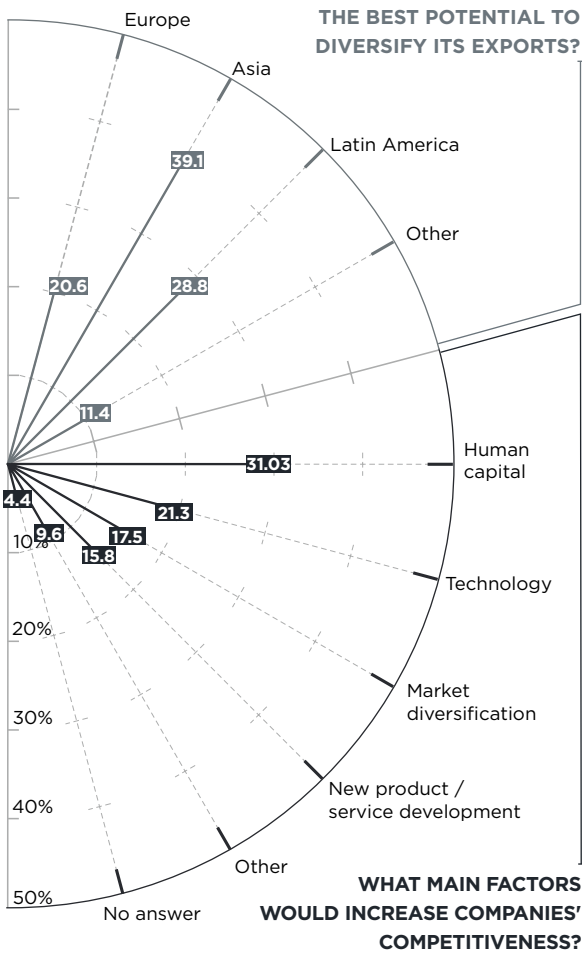


Sources: Mexico Automotive Review, Banco de México, AMIA, INA

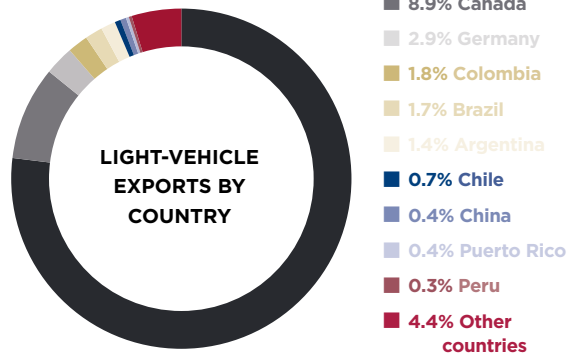
LIGHT-VEHICLE SALES IN MEXICO'S MAIN EXPORT MARKETS (millions of units)



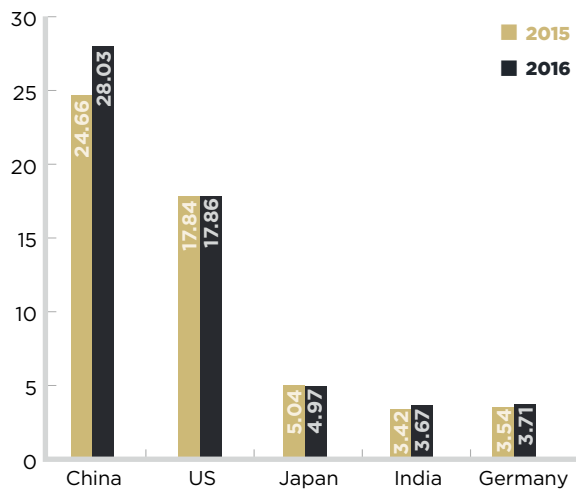
WHERE DOES MEXICO HAVE THE BEST POTENTIAL TO DIVERSIFY ITS EXPORTS?



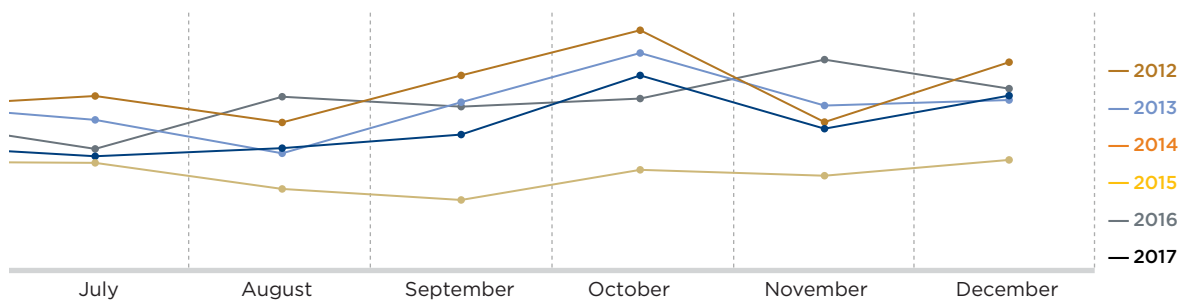
LIGHT-VEHICLE EXPORTS BY COUNTRY

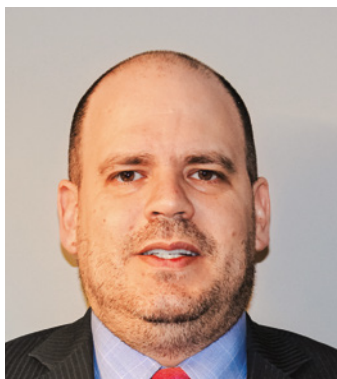


LARGEST VEHICLE MARKETS (millions of units)



WHAT MAIN FACTORS WOULD INCREASE COMPANIES' COMPETITIVENESS?





HOW CAN MEXICO RENEW ITS HEAVY-VEHICLE PARK?

MIGUEL ELIZALDE

Executive President of ANPACT

Q: How open is the government to updating the scrappage scheme?

A: The government has been open to revisiting the scrappage scheme's guidelines and there have been several adjustments to the program. The remuneration a person or a company can receive for their vehicle was increased, but it cannot surpass 15 percent of the cost of the new vehicle. The downside is that due to the volatility in the dollar-peso exchange rate, the increase in dollars has not been that much. With the January dollar-peso exchange rate, the limit value of MX\$336,000 is close to US\$18,970, which was indexed to the National Producer Price Index (NPPI). We lobbied for the government to index the incentive to the dollar-peso exchange rate but were unsuccessful. Nevertheless, the NPPI is still above the inflation rate. The scrappage scheme is evolving despite obstacles that hinder its appeal, such as owner-operators.

In 2015, 7,250 vehicles were destroyed through the scrappage scheme. But budget restrictions led the government to establish a limit of 6,000 units per year. Of that total, 3,000 vehicles can be scrapped by transportation companies, while the remaining incentives are destined to owner-operators. In 2016, applications reserved for companies were allocated by September and the program did not reset until January 2017. This means that by 2017, four months of applications had accumulated. In May, the authorities removed the 3,000-vehicle limit on companies owning more than five vehicles, so all 6,000 applications could be used by larger fleets. If the 6,000 limit is reached prior to January 2018, owner-operators could still use the scrappage program up to 3,000 more units. However, it is not enough to scrap 6,000 units per year, especially considering that at that pace it would take us 30 years to replace the 180,000 vehicles that are 21 years or older and should not be on the roads now.

The National Association of Bus, Truck and Tractor Manufacturers (ANPACT) has represented heavy vehicle and engine manufacturers since 1992, promoting the development of the transportation industry in Mexico

We have also asked the government to increase the total number of applications available in the program. Austerity policies have led the Treasury to limit the number of units that can be destroyed but to reduce the average age of the fleet we should be scrapping up to 20,000 thousand units yearly for the next 10 years.

Q: What are the main issues that need to be addressed to improve the scheme's performance?

A: The program needs to become more attractive for owner-operators. Otherwise, applications will continue to be wasted. The 3,000-unit limit was established by the Treasury to promote vehicle renewal among owner-operators and small businesses but the US\$18,970 remuneration might not be enough for these users and the government needs to take into consideration that this demographic might not be part of the banking population.

To address this issue, we proposed a chain program that allows two companies to participate in the scrappage scheme per application. The original initiative permitted each company to present an old vehicle and receive remuneration for the purchase of a new unit. The chain program involved two participants, a bigger player looking to buy a new vehicle to renovate a used but still functional vehicle, and an owner-operator wanting to scrap one of its old vehicles in exchange for the used unit. Unfortunately, this is more complicated and has not yet come into effect.

Q: How are other heavy-vehicle associations responding to the changes in the scrappage scheme?

A: The limited remuneration value in the scrappage scheme has also been a problem depending on the type of vehicle to be renovated. For trucks, US\$18,970 is close to 15 percent of the value of a new unit. Buses, however, require a bigger initial investment and might cost twice or even three times as much as a truck, so US\$18,970 is not as useful. Associations like CANAPAT are now lobbying for the incentive to be much greater for bus operators and we are completely supportive, considering approximately 60 percent of the applications for the scrappage scheme are for bus units.

WORKING TOWARD A STRONGER MARKET PRESENCE

LEONARDO SOLOAGA

Managing Director of MAN Truck & Bus México



Q: MAN has set goals for 5 percent market share in the truck segment and 18 percent in the bus segment. How successful have you been?

A: Between January and April 2017, we reached a 2.7 percent market share in trucks and a 16.4 percent share in the bus segment. There are still areas of opportunity for the company but we are well on track to reach our proposed goals by the end of 2018.

In past years, we have grown at a rate of 15-20 percent year-on-year both in sales and production in our plant in Queretaro. We expect to continue delivering the same results in 2017 and in the near future. Although we currently do not plan to export to the US, our operations in MAN Latin America are promoting our exports. Twenty Latin American countries have increased their exports by 40 percent so far, including Mexico.

Q: How has the company evolved in terms of client relationships and what new contracts have you closed?

A: Grupo IAMSA is one of our main clients at the moment and we are working to strengthen our relationship by offering new products and services. We are in the final stages of delivery for the last contract we signed with the company. We have also closed other major negotiations in 2017. Two of the most important contracts were with ADO and Heineken.

Q: What development plans does the company have to achieve 30-40 percent national content in its production?

A: We are restructuring our engineering and purchasing divisions in an effort to make them more oriented toward the development of Mexican suppliers. We are already in contact with several local companies who are now participating in the development of some of our components. Mexico is one of the most important heavy-vehicle manufacturers in the world. In 2015, the country was the largest truck exporter globally. The supplier network is strong and extensive and we are confident that local players are capable enough to address all our requirements regarding quality. Our strategy is to keep growing our local content, understanding the needs of our customers.

Thanks to the arrival of BMB Mode Center to Mexico, we will now be able to transform vehicles to suit the needs of our local customers. We will perform these changes with local supplies, guaranteeing the same quality as if these vehicles were originally manufactured with these specifications.

Q: How have the traditional VW and MAN families evolved and how are you integrating the latest additions to the company's product portfolio?

A: We are developing new vehicles with our body manufacturing partners, always integrating the latest advances in technology, innovation and alternative fuel applications, such as natural gas. The goal is to complement our existing product line by identifying the best opportunities in the market. In 2016, we released six new models to the market and by the end of 2017 we expect to deliver two or three more. As a result, MAN Truck & Bus México will have one of the most complete portfolios in the market. BRT models will be one of our new alternatives and we expect our vehicles to be available by the end of 2017. That being said, midibus models are still a crucial part of our portfolio. Our 15.190 model, for example, doubled its sales in the first months of the year.

Q: How successful have cab-over models been in Mexico and how are regulations promoting the adoption of these units?

A: Mexican operators are gradually accepting cab-over models because they understand the benefits the vehicle can offer in terms of cargo volume, maneuverability and visibility. Cab-over trucks are also more versatile when it comes to inner-city deliveries and are safer than conventional models. In the light-truck segment, acceptance for these vehicles is growing considerably and we expect that trend to translate to the heavy-vehicle market.

MAN Truck & Bus is a subsidiary of the Volkswagen Group.

The company is headquartered in Germany and focuses on the production of buses, light and heavy trucks. In Mexico, the company manages the VW and MAN brands



NEW BET ON MEXICO

ENRIQUE ENRICH

Director General of Scania Mexico

Q: How does Scania plan to develop a greater presence in the truck segment?

A: Mexico remained the biggest market for Scania buses for the second year in a row in 2016, although we are still number 27 in the market. We relaunched our truck portfolio in 2016 and have already delivered significant orders including one for the Mexico City fire department. We see this as an important market for the company to drive our growth. Scania achieved 50 percent market share in 2016 in the coach segment, which means there is little room for further development.

Our new bet is that in the next four years, over 30 percent of the trucks sold in Mexico will be cab-over units. Changes in regulations to NOM-012 regulating truck size will result in a full renovation with cab-over vehicles. We expect massive growth for companies dealing with cab-over units and Scania is already participating in that market.

Q: How did Scania's service network growth help the company maintain a strong foothold in the country?

A: In 2016, we inaugurated 12 service points across the country, nine of them within our clients' facilities. These companies designated a large area to tooling and spare parts services and dedicated personnel to clients' operations, making it easier for clients to take units to the closest service point. Our three other service points, located in Veracruz, Hermosillo and Culiacan, are open to the public. This marked another record for the company and we still have expansion plans for 2017, expecting to open two more service points in Tijuana and the south of Mexico City. We need one more operation in Mexico City because our current service shop is already full and working 23 hours a day.

Q: How successful have Scania's natural gas units been in the market?

Scania is a global enterprise with a service and sales network covering 100 countries as well as offering financial services. Its production facilities are located in Europe, South American and Asia

A: Scania placed a huge bet on natural gas vehicles but institutional uncertainty has limited the adoption of these units in several cities. Tijuana spent two years developing a new public transportation project with natural gas units. But due to a lack of permits to establish a natural gas station, the private operator decided to purchase diesel units. Other cities have had similar problems in terms of regulations, forcing natural gas to take a step back.

In 2015, I expected Scania's natural gas units to represent 25 percent of our total volume by 2017 but our volumes remain less than 3 percent of vehicles. Our natural gas success is directly linked to exogenous factors so it is difficult to predict when we will reach the original goal. We need government transparency in regulations in order to continue developing this industry.

Q: How will the peso-dollar exchange rate volatility impact Scania's operations in 2017?

A: Currency volatility motivated us to develop our aftersales operations. If we focused solely on selling vehicles, Scania would already have failed. We deliver quotes with a certain price and an expected profit margin but these change before we deliver the vehicle, aggravated by body manufacturers' timeframes. These companies normally took 60 days to deliver a vehicle but in 2016 the waiting period extended to 90 days. We are positive about the future of the Mexican market and we have changed our quotations to dollars to counteract these challenges. Clients understand because they know we tried to delay these measures as much as possible.

Q: What are your growth expectations for 2017 after the record numbers Scania achieved in 2016?

A: 2016 was not only a record year in sales but also in manufacturing activities, signed service contracts and sales of spare parts. Even though vehicle sales were favorable, our growth in these three other areas was even more noticeable. Our vehicle park in Mexico grew 10 percent while our aftersales division grew almost 30 percent, demonstrating a much more solid position in the market.

NEW BUSES AND NEW SHOPS TO KEEP THEM RUNNING

JAN HEGNER

CEO of Daimler Buses México



Q: Mexico is the number three market for Daimler Buses globally. How will you keep growing your presence here?

A: We have been a leading player in Mexico for the past 19 years. This country is so important for Daimler that we developed a unique bus for the domestic market that is not sold anywhere else in the world. This model, the Boxer, has been the most-sold bus in the country for many years. In 2016, we unveiled new innovative solutions that are fully oriented toward the needs of our clients, including the new Toreto bus. Other strategies include the launch of the Safety Bus system, which makes Daimler buses the safest in the market, and the inauguration of Center Bus service points across the country that guarantee our customers receive constant attention. Our broad and technological product portfolio and an aftersales service approach has helped us maintain our foothold in the market, coupled with our financing solutions supported by Daimler Financial Services México and a strong distribution network.

Q: Now that Safety Bus will be available in Mexico, how do you expect that to boost demand for Daimler units?

A: A high percentage of bus accidents are caused by human error. Passengers want to travel safely and bus operators want to offer safe travel. With Safety Bus, we can offer a special platform for the bus segment, with state-of-the-art technology that can decrease accidents and minimize their impact. We have shown the advantages of Safety Bus to clients around the country and we think it will be a great incentive for companies to renovate their fleet.

Q: In terms of distribution, what advantages does the Center Bus program offer to clients?

A: Center Bus is our innovative concept for the care, preservation and maintenance of Mercedes-Benz buses. It is a joint service offered by dealerships and our aftersales division, with the goal of increasing customer satisfaction. We already have a highly experienced distribution network and the services offered by Center Bus will take it to the next level. Our objectives with Center Bus are to offer a service that is 100 percent specialized in buses, with trained and qualified technicians. Facilities are adapted to optimize response times and clients always receive clear,

professional and quality information to help them in their decision-making process. Lastly, all our Center Bus service points are built to enhance the comfort of our operators and are available 24 hours a day, 365 days a year. It takes a dealership approximately one year to become a certified Center Bus point. Personnel must be trained, including collaborators, managers, technicians and the entire sales force. Currently there are four Center Bus service points in Mexico and our goal is to open two more by the end of 2017.

Q: How are you protecting revenues against the peso's weak position versus the US dollar?

A: The Mexican market requires constant vehicle renovation, which is why despite the unfavorable economic conditions the country might face, the industry remains stable. This helps us have a clear perspective of how the market will behave. Whatever economic certainty we can offer to our clients is a key factor in maintaining our company's profitability. We know that 80 percent of our clients invoice their operations in pesos and for this reason we have changed our own pricing to pesos since March 2015. In an effort to keep this from harming our finances, we have established a nationalization strategy for our parts and components-sourcing operations. We follow that same strategy with our spare parts portfolio.

Q: How has the Toreto been received in Mexico and what are your projections for this model?

A: Marketing Toreto was an excellent idea. The bus was designed to meet the mobility demands of large cities, including Mexico City. We sold 150 units in the first six months of the year and we are confident that its success will continue during the second half of the year. We see Toreto as an opportunity to renovate the microbus fleet in the city. This will transform Mexico's vehicle park and will reinforce our commitment to urban mobility.

Daimler Buses is a subsidiary of the Daimler Group focused on production and commercialization of bus units. The company manages three brands globally: Mercedes-Benz, Setra and BharatBenz



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CHANGE AND INNOVATION DRIVE GROWTH

MOSHÉ WINER

Commercial Director of Volvo Group México



Q: What are the main concerns of heavy-vehicle users and how can Volvo address them?

A: Clients buy our products to offer their own services in a timely and effective manner, which means that a broken unit stuck in a warehouse is not generating any money. Our offering goes beyond a bus; it is a profitable mobility solution. We need to deliver quality products and back them up with efficient support services. Close contact with customers is essential, especially if they service and repair their own units.

We train mechanics and operators on how to best service our buses. We also have maintenance contracts with several fleets, relieving clients of any worry regarding maintenance. The Mexican market is becoming more open to servicing contracts and we already have 600 deals within our existing client base. In addition to maintenance services, we have an expansive availability of spare parts. We can solve 96 percent of our clients' demands immediately and only 4 percent of orders have to be scheduled for later. Our network of 50 distribution and service points is essential to guarantee this level of efficiency and to meet our objective of keeping all Volvo vehicles up and running as long as possible.

Q: What factors drove Volvo's success in 2016?

A: Two factors propelled our growth. One was the success of the 9800 model, a major update from the 9700 model in terms of design and technology. The 9800 is taller and wider with top-quality noise-canceling technology for passenger comfort. It is also lighter and 5-7 percent more fuel efficient than its predecessor. This new generation of buses includes our safety technology package, which is a major pull factor for owners and also for passengers. The system includes an emergency brake assist that stops the bus if it gets too close to the car in front and a lane-keeping assist that sounds an alarm and makes the driver's seat vibrate if it detects the bus leaning toward the other lane.

The creation of our chassis offering for third-party body manufacturers was an outstanding success. Of the 755 units we sold in 2016, 200 were chassis. This was a huge

step for us, having been a one-stop shop for 18 years. Although that was a good strategy, we had to adapt to the needs of the market. This has pushed us to compete in new segments. Our complete models participating in the lower end of the coach segment, including the 8300, were efficient vehicles but less attractive in terms of design or cost-effectiveness. Now, we can offer our B410R and B290R chassis to body manufacturers and they can add their own interior and exterior design without losing the performance of a Volvo bus.

Q: What are your goals for the chassis market?

A: We plan to keep growing our chassis supplier arm so we also have to work on our market image. We are establishing new relationships in the market and body manufacturers are becoming our partners, although they remain our competitors in the luxury segment. Clients need to test our vehicles to appreciate Volvo is now a strong alternative for chassis. In just one year we sold 200 chassis and many were bought by returning clients.

Q: What is Volvo's position in the urban segment and how is the company innovating to grow its position?

A: The urban segment is the biggest branch of the bus market and Volvo has focused on maintaining its leading position in the BRT segment, participating in special tenders. We became BRT promoters in many cities and work closely with the government and operators across the country. We are also a strong competitor for low-entry units and were the first company to offer these models in Mexico.

The next step for Volvo is the introduction of Euro VI buses into the urban segment, even though NOM-044 established Euro IV as the industry standard until 2020. Mexico is invested in having the best technology to control pollution, particularly in Mexico City.

Volvo Buses is one of the leading coach and urban bus companies in the world, with operations in over 140 countries. The company delivers over 10,000 vehicles every year with the help of over 7,000 employees worldwide



AMBITIONS FOR MEXICAN AUTO PARTS

ÓSCAR ALBIN

Executive President of INA

Q: What is Mexico's current position in auto parts production and what are the country's goals for 2017?

A: Auto parts production remained stable in 2016, increasing approximately 1.5 percent compared to 2015. This was mainly due to stronger light vehicle production in the US, which fueled our exports there and to Canada. The final results of 2016 showed production of close to US\$83 billion of auto parts and our forecast for 2017 is to grow between 2 and 3 percent. Mexico is the sixth-biggest auto parts manufacturer globally, only behind China, the US, Japan, Germany and South Korea. Provided vehicle production remains on schedule and the US market keeps growing, we will be close to US\$100 billion in auto parts production by 2020. This would catapult us to fourth place in the international ranking, neck and neck with Germany.

Q: How many Mexican companies participate in auto parts manufacturing operations?

A: Approximately 25 percent of total auto parts production comes from Mexican companies, mainly Tier 2 and Tier 3 suppliers. There is a limited number of Mexican Tier 1 providers acting as true multinationals with significant production or sales operations abroad, but this happens in other countries as well. Design and engineering for vehicles and auto parts is concentrated in the US, Germany, Japan, South Korea and France, so most leading suppliers come from these nations. Mexico, among several other countries, is gradually seeing more leading national suppliers and several local companies have set international standards in the automotive industry.

Q: What is the biggest problem for the Mexican aftermarket and how can the industry address it?

A: We have a severe problem related to indiscriminate importation of low-value soft components, particularly

from Asia. A lack of proper Mexican norms has allowed entry to all sorts of components, regardless of their price or quality. We are not against auto parts imports and Mexico is a very open country with practically no added trade tariffs. Mexican companies are also prepared to compete against foreign components. But this is only true for parts of a certain standard. This level of quality is not defined as a rule to participate in the Mexican market.

Addressing this issue is one of the country's priorities but it is difficult to fix. Canada solved a similar problem when signing NAFTA by incorporating quality norms from the US. Mexico decided to write its own norms but the process has proven to be a real ordeal because we lack the technical skills or testing facilities necessary to develop these regulations. NAFTA renegotiations present an opportunity to write a specific chapter focused on quality standards for the whole region. This would save us years of work and it would be an excellent boost for product quality.

Q: What led to China becoming such an important presence in the international aftermarket industry?

A: All countries buy vehicles but only 12 are responsible for the world's automotive production: China, the US, Japan, Germany, South Korea, India, Mexico, Spain, Canada, Brazil, France and Thailand. These are the most important markets for original equipment components. Auto part manufacturing has developed around those countries and few have ventured to export to other regions.

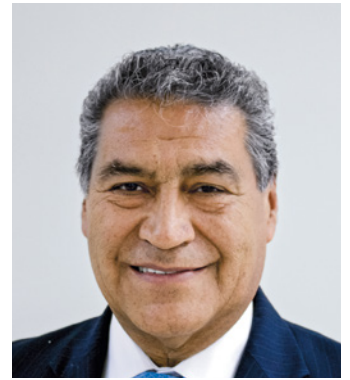
Normally, the only components that travel overseas are those destined to the aftermarket and to be successful in this kind of venture, companies must invest heavily in marketing and localization strategies. In 2007, China decided to become the aftermarket supplier for the entire world, forcing other countries like Mexico's manufacturers to compete with Chinese imports. Almost 40 percent of the components used in the Mexican aftermarket are imported, mostly from China. The market has become extremely price-competitive and the only way for Mexican companies to compete is to abide by strict quality policies that override the low prices China can offer.

The National Auto Parts Industry (INA) is an association formed by auto part manufacturers that wanted representation before Mexico's government. Its goals are to promote the growth and sustainable development of all its members

NEAR-NET GEOMETRIES, HEAT TREATMENTS, ALUMINUM TO STAY CURRENT

MARIO RODRÍGUEZ

CEO of Arbomex



Q: What are Arbomex's goals in terms of material and process innovation?

A: Our main strength is our vertical integration between iron foundry and precision machining. This integration gives us enough competitiveness to stand up against our international counterparts. In terms of innovation, we have substituted steel products with heat-treated iron. Our next step is to develop a foundry process for iron that can replace steel without the need for an additional heat treatment.

We are waiting to obtain the first patent for a camshaft manufactured through a foundry process of iron and steel. This will be a disruptive improvement for the engine. Combining both materials will result in less weight, lower costs and better injection-system performance. We need to work on our testing processes, to assure our clients that this component will provide better quality at a lower cost.

Q: How can Arbomex solve engine and injection-system problems to improve vehicle efficiency?

A: There is a trend to change the traditional Otto cycle in an engine to the Atkinson model and that puts a lot of pressure on the camshaft. This component operates the valves that will allow air to enter and exit the cylinders thus controlling the moment fuel is injected to the engine. We have a specialist dedicated to analyzing several types of engines and establishing a benchmark of the advantages each presents. That way we can offer several solutions for our clients to choose whatever works best for their performance, cost and efficiency objectives.

Suppliers are increasingly involved in the design process for new components. This allows us to analyze and test all aspects related to a new part, along with its manufacturing conditions and related costs. That is how we designed a solution for one of our main customers. The system previously had only one cam and we added another two. That way, according to the fuel demand and speed stability, one or maybe two cam actions could reduce fuel consumption. Our improvements may be advantageous in terms of manufacturing or logistic costs and the client must decide how best to alter its operations.

Q: How will Arbomex address the growth of electric and hybrid cars in the industry?

A: The three main drivers for the automotive industry are mobility, connectivity and alternative energy sources. By 2035, we expect electric vehicles to take over the market and we are preparing to face this development accordingly. We must take the elimination of camshafts as a likely scenario and that will lead the company in two directions. The internal combustion engine, although it may be limited, is unlikely to disappear and we want to be the best camshaft company in the world. At the same time, we are targeting the heavy vehicle industry, particularly in parts that are expensive to manufacture. We plan to move toward other types of components, delving into near-net geometries and new materials like aluminum.

Q: How has Arbomex's possible joint venture with a Japanese company evolved?

A: The company wants to take advantage of the experience Arbomex has in the Mexican market but recent exchange rate volatility and the situation between Mexico and the US has slowed the process. But negotiations have not halted and we hope to finalize the deal before the end of 2017.

Q: How can Mexico attract further investment in advanced manufacturing and design processes?

A: Software and basic engineering processes are still carried out abroad. Most design centers in Mexico focus on small changes and product adaptations according to the region but the base design is done in Germany, Japan or the US. Each day more and more universities are collaborating with companies to encourage innovation and entrepreneurship among students. Some institutions already have excellent manufacturing and material research centers but the industry would benefit from more integration with them.

Arbomex is a Mexican company that specializes in engine component manufacturing. This includes camshafts, foundry and machined precision parts. Its main export destinations are the US, the Czech Republic, Germany and China



EXCELLENT RESULTS DESPITE CHALLENGES

MARTÍN ROSALES

President and Managing Director of Goodyear México

Q: How did external factors impact Goodyear's performance in Mexico in 2016?

A: We saw excellent year-end results in 2016 compared to 2015, which was challenging within the context of an economy with slower growth. The projections for GDP growth for 2016 were overestimated and the Mexican peso's value weakened unexpectedly following the US elections. In 2015, the currency devaluation was associated with oil prices, so when we worked on our plan for 2016 we did not anticipate these challenges. Changing circumstances forced us to revise our plan, adjust decisions and act on a larger scale. We have grown in volume by improving the mix of products we sell and increased profitability by efficiently handling our costs, finally leading to the financial results of 2016. Alongside other Latin American countries with different economic contexts, Mexico's automotive industry registered record production levels in 2016 and new vehicle sales in the local market helped spur our double-digit growth.

Q: What is Goodyear's participation in the original equipment segment in Mexico?

A: We always maintain our position as the first or second-biggest brand in the country, both in car and SUV applications. This latter segment is growing quickly along with the light truck segment, especially in the north of Mexico. We participate in original equipment in all vehicle platforms as part of our company strategy, preparing for the consumer trends of the future.

Q: What need will Goodyear's new production plant in San Luis Potosi address when it starts operating in 2017?

A: Our plant's production will begin in mid-2017. In April 2015, we invested US\$550 million to create the new Mexican plant and construction is progressing as planned. During 2016, 3.4 million vehicles were produced in Mexico and projections of infrastructure for vehicle manufacturing indicate that

by 2020 there will be 5 million vehicles produced per year. Those vehicles will require the type of tires that we decided to produce in Mexico. The old vehicle park needed tires for 13 or 14-inch rims. Everything that is currently bought in Mexico is for 16-inch rims or larger and that vehicle platform requires production of high-performance tires. They must also meet increasingly complex technical specifications. Few manufacturers in the industry can meet the technical requirements of cars being sold today. The plant we will open in 2017 will have top Goodyear technology, even more advanced than our other 50 sites around the globe. The quality of our staff and processes will afford us high-performance products to fit vehicles to be produced in Mexico. Even though the plant will begin production in the second half of 2017, we have already hired more than 400 personnel for the 1,000 direct jobs we want to create.

Q: What are the main trends driving innovation for Goodyear's operations?

A: There are two major trends in the automotive industry. The first is looking for energy sources or alternative fuels that are eco-friendly and the second is to improve the driving experience, particularly as the industry moves toward autonomous vehicles. In alternative fuels, the most commonly seen advances are in electric cars. 'Goodyear innovatively designs and creates new products for electric vehicles in preparation for the market of the future. Driving an electric car is a much quieter experience than driving a gasoline-fueled car and this must be taken into consideration when developing new products for this segment.

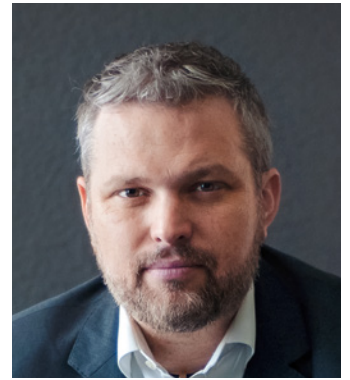
Another innovation that Goodyear unveiled at the Geneva International Motor Show was its latest concept tire, called Eagle 360 Urban. It is designed for the cities of the future, which will have vehicles that are not only silent but also autonomous. Among the advantages of the concept tire is that by being spherical, it allows the vehicle to move in any direction. One of the most interesting developments we worked with was that when the tire detects water or a surface variation it can adapt its shape, or if it senses a defect on its surface, it will rotate to compensate without compromising performance.

The Goodyear Tire and Rubber Company is a multinational tire manufacturer founded in 1898. Goodyear generates sales of over US\$15 billion per year from Goodyear tires and its related brands: Dunlop, Kelly, Fulda, Sava and Debica

ALL ROBOTIC HANDS ON DECK

MANUEL SORDO

General Manager LATAM of Universal Robots



Q: What strategies have helped Universal Robots to stand out in the competitive robotics market?

A: Innovation has allowed Universal Robots to take approximately 80 percent of the global market share in collaborative robots. Our goal has been to define the different aspects that make up a collaborative robot and so far, the largest names in robotics have not been able to compete with us in our specialty. The gap has narrowed over the years but we are planning a new product launch for the end of 2017 that will once again put us well ahead of the competition.

We started operations in Latin America during 2012 and every year we have grown 250 percent on average. When we arrived in Mexico, Universal Robots was practically unknown but over the last six years we have noticed exponential growth in our market presence. Although we were competing against mature leaders in the robotics sector, we discovered a previously untapped niche in the collaborative robot segment. Programming ease was the decisive factor that allowed us to secure such a large market share. Our hardware and software are developed in-house together with a simple interface that any person can learn to use in just two hours.

Q: What advantages do collaborative robots offer over traditional automation units?

A: If we compare traditional industrial robots from 40 years ago with the machines of today, there are few physical differences. Programming and versatility have evolved but the technology has remained practically unchanged. Advanced programming also requires a high technical aptitude, resulting in complex equipment that cannot be used by everyone. These robots also require large investments in installing protective cages to isolate them from the rest of the production line.

Although collaborative robots do not have the same load capacity as their industrial counterparts, their advantages are numerous. These units do not require cages or other types of protection equipment. They occupy a small area and the user can relocate them throughout the plant to complete different tasks. The robots have several sensors that detect

human operators and slow the unit down if a person comes in close contact. If the person touches the robot, it stops moving completely. This does not compromise the entire production line, however, because operators need only press a couple of buttons for the robot to resume its task.

Q: How relevant has Universal Robots become to the Mexican automotive industry's growth in 2017?

A: BMW, FCA, Volkswagen, GM and many automotive companies use our robots in Mexico. We have aggressive growth expectations. Globally, we expect to keep growing between 70-80 percent and plan to increase sales in Latin America by 300 percent by the end of 2017. We are negotiating with several OEMs that are new to Mexico and are close to finalizing international deals. Latin America represents 20 percent of our sales in North and South America and by 2020 we expect that number to grow to 40 percent.

Q: How can Universal Robots compete on total cost of ownership of the equipment?

A: Our robots are designed to be maintenance free. The equipment can run continuously for 35,000 hours and if any repairs are needed, the system being based on a modular architecture allows corrections to be made in a matter of minutes. Our distribution network is equipped with all the necessary spare parts to offer repair services immediately at all times. Our 100 sales representatives in Mexico are dedicated to sales and service operations, and our engineers are trained to operate and repair our products.

Our robots are versatile so users can relocate them to any area they desire. Being truly universal means countless companies in the market that manufacture accessories could use our robots in diverse production applications. The company's goal is to imitate a human arm's abilities and offer our clients a high level of customization.

Universal Robots is a Danish company that aims to integrate collaborative robotic technology into all types of manufacturing companies, regardless of their size. It is the market leader in collaborative robots



DIVERSIFY TO COMPETE AS AN INDUSTRY

OMAR ESPARZA

Senior Manager, Global Key Accounts, Automotive, Mexico
and Latin America at Mitsubishi Electric

Q: How is Mitsubishi Electric's participation impacting the development of the automotive industry?

A: Both private and public companies need to improve their technological processes for the country to keep growing. Mexico has gone through a technological revolution in the past 10 years, moving from its low-cost manufacturing foundation to a low-cost but high-quality production standard. Mexican labor has evolved with the industry and companies now recognize the country's capabilities.

Previously, 100 percent of the equipment used in manufacturing operations was designed and manufactured abroad. Today, Mexican engineers participate in design processes to attract new investment projects. Mitsubishi Electric has become much more globalized in that sense. We no longer focus on talent and knowledge transfer. The company is now looking for talent and potential around the world, leveraging the needs of each region. We innovate so that our products will be adopted by capable local talent, and we identified Mexico as a country of opportunity.

Q: How could the current economic and political climate boost the national industry?

A: Exterior political challenges will push all companies in the automotive sector to become more productive and cost-effective. Regardless of size, all industry participants must make technology one of their priorities to remain competitive as part of a long-term growth strategy. Before, the lowermost levels of the production chain usually had few demands in terms of automation and technology integration. The work was artisanal but relying on these types of companies left suppliers vulnerable. After years of depending on imported components, bigger companies are now helping the local supplier network to grow and develop the necessary strengths to compete in an industrialized environment.

Mitsubishi Electric applies advanced technology and expertise to a range of business segments. The company also makes social contributions as a global, leading green company

Q: How can Mitsubishi Electric incorporate the latest technological trends into its business development strategy?

A: Market diversification is the key to developing our presence. German companies often supported other German companies, while Japanese players did the same. But to truly participate amid the new market challenges and technology needs, we need to expand and overcome country borders. In Mexico, this is happening more often as we expand from an initial client portfolio of almost purely Japanese companies. The more open we are to European and US standards, the more we can collaborate with other players.

Open platforms are no longer simply an alternate business strategy because of the need for efficiency in the globalized market. Now, compatibility is a requirement. Mitsubishi has worked for years on this subject, developing what is called our e-F@ctory concept. It operates under the same principle as Industry 4.0 or the internet of Things, based on connectivity and obtaining crucial data from manufacturing processes.

Our goal is to offer the best cost-benefit results depending on the technology clients acquire. We want companies to understand how our technology works, so we are transparent about how their investment will develop. The last five years have been crucial for our presence in Mexico. The company is a strong player here and although we could grow indiscriminately, our goal is to be selective with our partners.

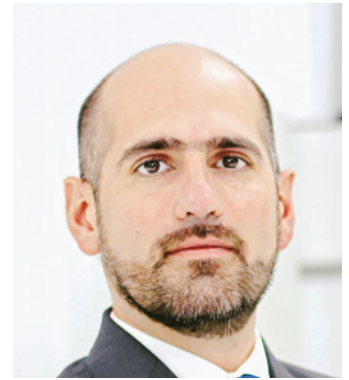
Q: What is Mitsubishi Electric's perspective regarding the future of the automotive industry?

A: The market follows economic trends and though there may be uncertainty at the moment, we are confident it will turn out for the better. While NAFTA is a trilateral agreement and Mexico has much to offer, we hope the political circumstances serve as a lesson for the Mexican government regarding its dependence on the US and therefore its vulnerability if it does not diversify. In the meantime, Mitsubishi Electric remains committed to its relationship with Mexico, demonstrated by the fact that we have opened new operations facilities in Queretaro's Technology Innovation Park. The country is the entry point to the Latin American market and we have to move forward with our plans no matter what.

METROLOGY LEADER SEES SOFTWARE DEVELOPMENT OPPORTUNITY

ARTURO ZAVALA

National Sales Manager of Carl Zeiss de México



Q: What role will Industry 4.0 play in the development of the Mexican automotive industry?

A: One of Mexico's main advantages is its cheap labor but once Industry 4.0 becomes standard in all companies, production costs in Europe and the US might match those in Mexico. If this happens, the only option for Mexico to remain competitive will be to move past its initial image as a low-cost and nontechnological manufacturing hub. We have tried to change our clients' mindset regarding technology, especially among SMEs, to accept and integrate it into their operations.

Q: How is Carl Zeiss innovating and participating in the latest manufacturing trends?

A: We want to participate by developing software that helps companies integrate Industry 4.0 practices into their quality processes. We have years of experience with hardware but Carl Zeiss' future is in software and complex solutions that connect equipment and automate quality processes. We are looking for alliances and merging with different software and technology manufacturers to develop new products and new markets. We have a software development center in Munich to implement this strategy. πWEB is an example of a software solution we developed to easily create statistical reports and to correlate data that allow for agile decision-making.

As part of our digital strategy, we are also building a web-store. Carl Zeiss has migrated its catalogs and all traditional operations to the web so clients can configure their solutions to meet their needs and receive quotations for new equipment accessories. Once Industry 4.0 becomes more prevalent, we want our equipment to be connected to an intelligent system that can schedule maintenance and repair operations in a predictive way without the need for human intervention.

Industry 4.0 is also present in our strategy related to 3D scanners. Digitalization is a megatrend in the automotive industry and coupled with additive manufacturing techniques, it teaches companies to become more flexible and efficient. 3D scanners provide enormous amounts of data that can be uploaded to the cloud, achieving greater interaction between the equipment, the design process and the component itself.

Q: How much did Carl Zeiss' industrial metrology division grow in 2016 compared to 2015?

A: There has been a considerable increase in the acquisition of metrology equipment in Mexico. Between 2015 and 2016, Carl Zeiss enjoyed more than 50 percent growth in domestic sales. For 2017, we expect at least 25 percent growth. Metrology is becoming increasingly important in the Mexican industry. OEMs establish quality standards among their main Tier 1 suppliers and these companies transmit those standards to their entire supply chain, reaching even SME players.

Q: How important is Mexico to Carl Zeiss' global operations?

A: Foreign investment has helped local industry evolve but the real development will happen once small and medium-sized Mexican players can add value to manufacturing. Companies will create their own research and engineering centers, leading them to export technology from Mexico. Carl Zeiss is committed to helping these players grow. We have a product portfolio that targets Latin America and stands out because it boasts lower prices achieved through cost-effective strategies. Our Latin American clients receive the same technology as our bigger collaborators but at more accessible costs. Providing financing schemes also helps to penetrate the market. We understand budget limitations can impede a company's technological advancement. We created leasing options for clients that need the equipment but lack the immediate liquidity to acquire it.

The final alternative we offer to support clients is to become partners during their product-development process. We collaborate with research centers and have just opened a Demo Center in Monterrey fitted with our equipment, which clients can use as their own research center. Monterrey was our first venture, mirroring the region's tendency toward innovation and entrepreneurship. Our goal is to have a Demo Center in every industrial hub in Mexico.

Carl Zeiss is a German company with a specialized division focused on industrial metrology. Carl Zeiss' portfolio includes CNC coordinate measuring machines, multidimensional metrology and image processing systems

MEXICO

AUTOMOTIVE REVIEW

2018

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