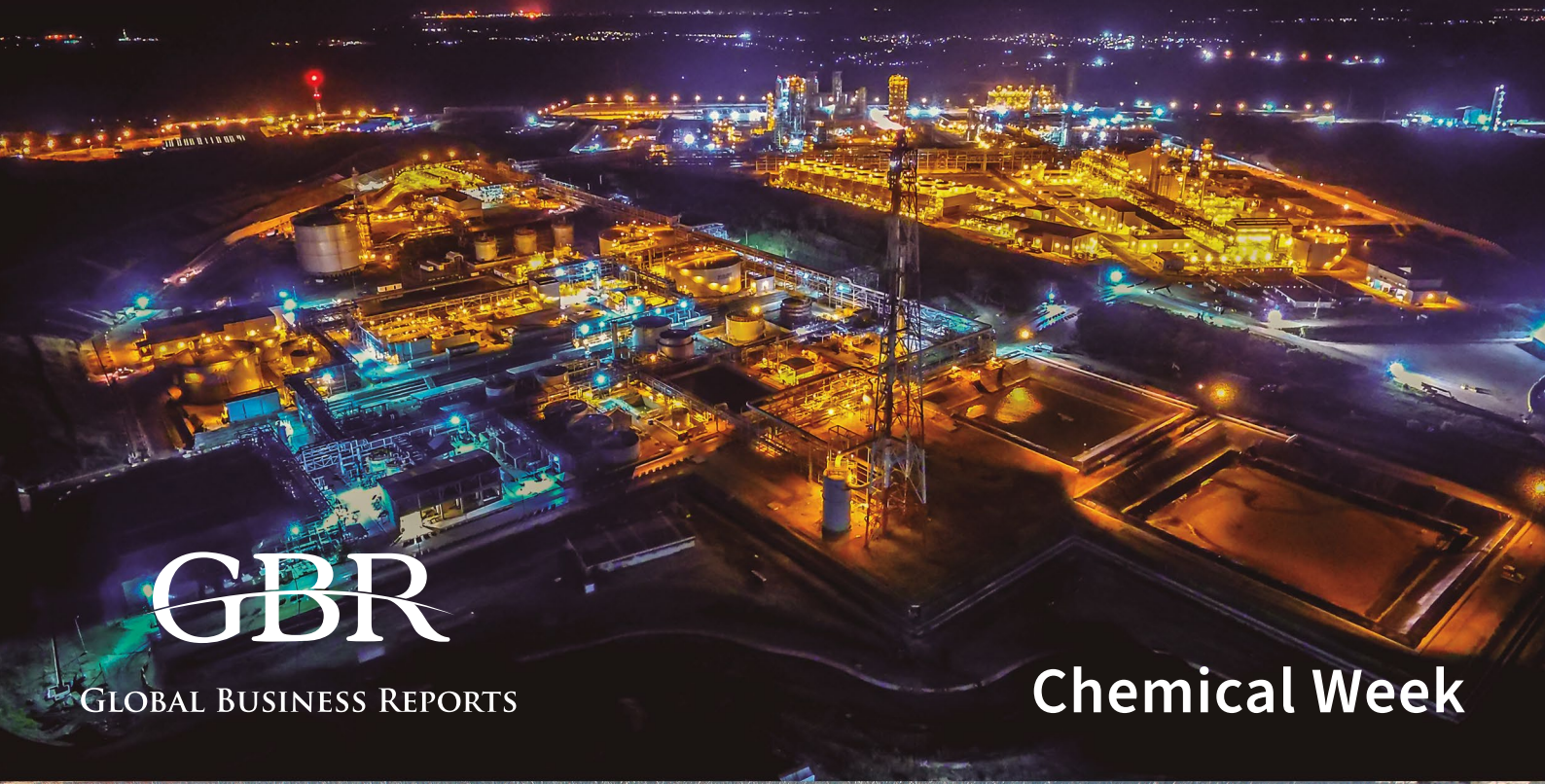


# SPECIAL REPORT ON MEXICO

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# Mexico's Petrochemicals and Chemicals Sector

This report has been produced by Global Business Reports. Research conducted by Ben Cherrington, Maria Filippova, Kolby Kaller and Marta Armengod. For more information, please visit [gbreports.com](http://gbreports.com), or contact [info@gbreports.com](mailto:info@gbreports.com). Cover photos courtesy of Braskem Idesa, AMVAC, ANAFAPYT and Grupo Dynasol.

## INTRODUCTION

The re-regionalization of supply chains offers Mexico a golden opportunity, but frustration remains as raw material availability constrains growth

Mexico offers a number of inherent advantages that, at least in theory, make the country a land of opportunities that few emerging markets can match. Its geographical location with road and rail access to the US, as well as ports on the Pacific and Gulf of Mexico coasts, ensured that trade with North and South America, Asia and Europe was not as badly impacted by Covid-induced logistics disruptions as other Latam countries. Furthermore, an abundance of young talent and competitive labor costs give Mexico's manufacturing sectors the foundations to serve more than just the country's own considerable domestic market.

While the pandemic is unlikely to be the death knell of globalization, it has certainly highlighted the value of strengthening regional

supply chains. "I believe that Mexico and Vietnam are the answers to the 'China + One' approach that the US is trying to answer," stated Martín Toscano, president of Evonik Industries Mexico, observing that many companies have become interested in setting up shop in Mexico due to the USMCA and EU-Mexico free trade agreements, which came into effect in 2020.

Toscano believes that the logistics situation is unlikely to improve before the second half of 2022, so a trend towards stronger regionalization could stand Mexico in good stead.

However, foundations and favorable market trends cannot be taken advantage of without the materials to build with. Although many of the 75 companies interviewed for this report claim record sales figures for 2021, they also lamented a lack of domestically supplied feedstock as the biggest factor limiting growth in a sellers' market.

Miguel Benedetto, director general of the Chemical Association of Mexico (ANIQ), cited a lack of raw materials supplied by Pemex as one of the two major themes impacting the country's chemical sector at the beginning of 2022. "There is a shortage of ammonia, which is extremely important for our fertilizer sector, as well as all the derivatives of ethylene," he said, revealing that the Mexican chemical industry is currently producing at 60% capacity.

Braskem Idesa's announcement in September 2021 that it will build an ethane import terminal with Pemex offers hope in the medium term that a downward trend in supply could start to reverse, but construction of the required infrastructure will only be finished in two years.

Considering the Mexican government has shown little appetite for investing in Pemex's neglected petrochemical facilities, what can companies in Mexico do to mitigate the challenges brought on from a lack of domestic feedstock?

Adam Rothman, managing director, partner, and head of chemicals and process industries in North America for Boston Consulting Group (BCG), approached this question from two angles: What to do now and what to do in the future? "Right now, if you are a petrochemical



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**Miguel Benedetto, Director General, Chemical Industry Association of Mexico (ANIQ)**



**Stefan Lepecki, CEO, Braskem Idesa**






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producer and buyer of these feedstocks, the focus should be on flexibility, both in terms of which feedstocks you can consume as well as the ability to import from the Gulf Coast if needed.”

Looking ahead, Rothman suggested that if feedstock challenges are sustained, the investment profile in the Mexican chemical industry might change: “Mexico could be less strong in petrochemicals and more focused on specialties and other products that are less dependent on the availability of feedstock. Import-export balances may also adjust.”

BCG estimates that approximately 60% of the Mexican chemical industry is currently comprised of petrochemicals, 25% specialties, and 15% others.

Adrian Duhalt, post-doctorate fellow of Mexican energy studies at Rice University’s Baker Institute, weighed in on the subject, explaining: “Inadequate supply of inputs or an adverse economic outlook may discourage companies from investing in a specific country, but when there is political will to welcome private capital, firms time and again find ways to navigate through uncertainty,” adding that in the case of Mexico, the lack of this type of political will that is hampering petrochemicals and the energy sector at large.

## VOTE ON ELECTRICITY REFORM DELAYED UNTIL Q2 2022

On September 30th, 2021, President Andrés Manuel López Obrador (AMLO) presented a constitutional reform of the electricity sector to Congress, which aims to modify three articles of the Mexican Constitution (25, 27 and 28), reversing key parts of the 2014 energy reform

that opened the sector to private investment. The vote on the reform was subsequently delayed to 2022, with initial talks opening in Congress in January 2022.

The government wants to pass the bill by the end of April 2022, and Miguel Benedetto revealed that ANIQ hopes to enter into dialogue with the AMLO administration to make the reform less aggressive. ANIQ conducted a survey with its members to establish the impact the electricity reform could have on the Mexican chemical sector, which produced concerning results.

One of the proposals of the reform is that the national electricity producer, CFE (Federal Electricity Commission), should hold 56% of total production capacity. Today, CFE holds 40%. “This change would impact the chemical industry by over 2 billion Pesos, as the electricity the industry is consuming is cheaper than the electricity that would be bought from the CFE under the current reform terms,” said Benedetto.

Benedetto added that a further 1 billion Pesos impact would be incurred from changing the energy source, as the CFE generates power from less competitive sources than the power currently being generated in the chemical industry. “Approximately 70% of the Mexican chemical production is based in Tamaulipas, Veracruz and Nuevo Leon. If the bill were to be passed in its current form, it would cause a tremendous impact to the economies of these states,” warned Benedetto.

Abraham Klip Moshinsky, director general of Unigel Mexico, explained that, considering the current prices of importing from Asia, now should be the time to invest in Mexico, but uncertainty surrounding the reforms is making people think twice about making investments into the country: “It is important that the government does not decide to produce all the electricity themselves through burning fuel oil, specifically in light of the global transition effort

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**Martin Toscano, President, Evonik Industries Mexico**



**Abraham Klip Moshinsky, Director General, Unigel Mexico**

towards greener and cleaner energies. Plastiglas (Unigel’s Mexican subsidiary) has developed environmental energy projects, but we are now thinking twice about implementing these as there is too much uncertainty in the near term.”

When the proposed reform was first announced, interviewees for GBR’s Mexico Chemicals report were understandably quick to voice their concern. However, by February 2022, after the industry had time to digest the potential outcomes of the vote, a noticeable shift was apparent. First of all, AMLO’s Morena party and its allies do not have the support to get the reform through congress in its current state, so a compromise is required. Secondly, pressure from leading private sector companies and Mexico’s main trading partners, most notably the US, could see the reform softened by the time new regulations are voted on. In January 2022, the Mexican President met with US energy secretary Jennifer Granholm in Mexico City, as pressure from US diplomats and multinationals mounted.

Federico Muciño García, consulting partner and founder of EP-SCON, a Mexican company specialized in energy procurement, warned that the reform would not only affect companies operating in the energy sector, but energy procurement options available to consumers would also be affected. However, he expects the proposal to be modified, and predicted that although changes will be made, the market will have time to adapt to the reform: “Even if new regulations are approved, there will be a six month period after the vote where secondary laws have to be agreed upon, so it will take from one to two years for any changes to actually be implemented,” he explained.

Discussing what industrial players could do to mitigate the impact of any reforms, García commented that companies should pursue energy efficiency projects, considering that the payback time for such projects is often fast, with ROI being achieved within 6 months in some cases. “There are no new power plants being built in Mexico and the present uncertainty will probably cause a shortage of available power options in the coming years, so I encourage companies to move forward with energy efficiency initiatives now.”

Another ray of hope surrounding energy reform is that AMLO’s rhetoric is often more radical than the policies that his government is able to implement. Evonik’s Martín Toscano took a broader view of Mexico’s position as an investment destination: “Today, Mexico is the 9th most favored destination for FDI in the world, whereas we were not in the top 10 before the pandemic,” he said, concluding: “This is an illustration that, despite ongoing discussions and friction when it comes to the agenda of the government, Mexico remains an important investment destination.” ■



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## SUSTAINABILITY

### Clean energy and recycling headline the mega trend shaping industries

Almost without exception, the one trend all interviewees for this report could agree on was the inevitable rise of sustainability-driven products and investments. A transformation in the chemical sector is taking place, and while each company is at different stages of development, the question is not if changes should be made, but rather how companies should adapt and evolve. Indeed, ‘consensus’ was the buzzword at COP26 in Glasgow in November 2021, where after six years of strenuous negotiations, pending items that had prevented the full implementation of the Paris Agreement on carbon markets and transparency were finally approved.

Adam Rothman, managing director, partner and head of chemicals in North America for Boston Consulting Group (BCG), discussed how the topic of sustainability is transforming the industry and leading to investment in new products. Rothman views sustainability as having four major sub-components: “First, there is a piece around net zero, which is about reducing the carbon footprint of your manufacturing operations. This leads to a number of investments in energy efficiency and renewable power.”

The second component Rothman cites is product innovation to improve the life-cycle carbon footprint of the next step in the value chain, sometimes known as the “handprint” of a chemical product. He gave the example of additives that make a coating last longer and plastics that enable a lighter-weight car. Third, BCG sees secular growth of products that are directly linked to energy transition, such as materials used in electric vehicles or hydrogen storage.

The last sub-component mentioned by Rothman is focused on the circular economy: “Circular economy means managing the entire life cycle of chemical products, and has become especially important in single-use plastics. We will see new investments here in waste collection, sorting and waste-to-value technologies.”

Adrian Duhalt of Rice University’s Baker Institute observed that the current policy structure in Mexico is heavily oriented to bolster fossil



Verónica Pérez, President – North Region of Latin America, The Dow Chemical Company



Rafael Méndez, Regional Director – Latam Northern Tier, Croda

fuels. Duhalt pointed to actions such as Pemex building a refinery in the President’s home state and announcing the acquisition of another refinery in Texas in 2021 as being in stark contrast to the official narrative coming out of other Latam countries such as Chile and Costa Rica.

Although some of the antiquated policies of the current Mexican administration seem at odds with global trends, the majority of the medium and large companies within Mexico’s chemical industry value chain are swimming with the current and investing in sustainable products. José Magalhães Fernandes, vice-president of Honeywell Performance Materials & Technologies and Honeywell’s general manager for the Latin America region, spoke of the renewable fuels the company is developing, where vegetable oil, animal fat, or cooking oils are converted into green diesel through the company’s UOP Ecofining process: “Honeywell Green Diesel emits up to 85% fewer greenhouse gas emissions than traditional fuels. Unlike biodiesel, renewable green diesel is chemically identical to petroleum-based diesel and can be used as a drop-in replacement in vehicles with no modifications required.”

Salvador Urbina, energy and engineering vice president of the North Latam region for Linde, acknowledged that most of Mexico’s energy currently comes from fossil fuels, but there is now a lot of

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interest and investment being directed to renewables. Urbina cited clean hydrogen as one of the “hot commodities” that will enable the transition to low carbon energy, and detailed that Linde has already built over 200 fueling stations worldwide, as well as being the biggest supplier of hydrogen in Mexico.

Linde is focused on low total cost of ownership (TOC) per kilogram of hydrogen fueled, according to Urbina, who added: “Linde also offers hydrogen energy storage solutions to balance supply and demand in intermittent renewable energy systems. Within heavy industry, hydrogen holds the key to decarbonization.”

Another of the multinational organizations active in Mexico is Covestro. Arturo Molina, Covestro’s managing director in Mexico, stated: “We do not see biomass, CO<sub>2</sub>, and recycled used materials as waste, but rather the raw materials of the future.”

Molina gave the example of aniline, a basic material for the chemical industry traditionally derived from benzene, a petroleum-based raw material. Covestro has been able to produce aniline using raw paper and industrial sugar as a biomass through a newly developed process which uses a microorganism as a catalyst to first convert the industrial sugar into an aniline precursor, from where the aniline is then derived by means of chemical catalysis in a second step. In this process, 100% of the carbon in the aniline comes from renewable raw materials.

Looking ahead, Molina suggested that in the long term, end-of-life products and unavoidable waste are likely to become the main alternative raw materials for the plastics industry. “But in order to make greater use of these sustainable resources, waste management systems must be improved and redesigned,” he said.

This subject was expanded upon by Aldimir Torres, president of Mexico’s National Association of Plastic Industries (ANIPAC), who explained how ANIPAC is working with authorities to transform plastic waste from garbage to a high value raw material: “Our New Plastics Economy (NEP) is an initiative to create an economic model where plastics are reincorporated as valid material rather than thrown away.”

Torres noted that Mexico has one of the highest recycling rates in the world, at approximately 26% (compared to 19% in the US, for example); one of the world’s largest transformers for recycling PET materials; as well as the largest plant for polyethylene recycling in Latin America. However, he gave an indication of the size of the task at hand: “Considering migrating to the use of bio-materials, the world’s recycling capacity is only about 2 million tonnes per year (mt/y), but in Mexico alone, we need capacity of approximately 3.3 million mt/y. This is a great challenge.”

Speaking of the effort to stimulate recycling, Verónica Pérez, president – North Region of Latin America for Dow Chemical Company, commented: “In addition to new infrastructure that is needed to facilitate recycling, we require the hands and knowledge of the citizen.”

Pérez added that although this is a global effort, it requires regional focus, and she gave the example of Dow’s work with Fundación Teletón, the non-profit organization that treats people with disabilities, cancer and autism: “We have been working with Fundación Teletón through their rehabilitation centers and our sites to recover plastics that are then recycled, and many of these recycled products can be used in materials for their therapies.”



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Cemex, the Mexican multinational building materials company, is linked to the chemical industry through the company's use of additives and aggregates used to enhance the performance of cement. Vicente Saiso, Cemex's head of global sustainability and frequent ANIQ collaborator, revealed that waste which can be used as fuel is a big focus area for the company. "Plastics, textiles, and wools, preferably those that have a biomass content, are examples of waste that can be transformed into a clean source of energy," he said, noting that the price of certain waste material can be lower than primary fuel.

Gustavo Perez, LyondellBasell's regional director of advanced polymer solutions in Latin America, also emphasized the importance of circularity, giving the example of LyondellBasell's partnership with SUEZ to establish Quality Circular Polymers (QCP), a mechanical recycling joint venture. Perez went on to reveal that the company is investing in the development of new advanced (molecular) recycling technologies. He added: "We see this type of advanced recycling as complementary to mechanical recycling. We believe it can play an important role with materials where mechanical recycling is challenged such as mixed waste and multilayer films."

## BIO-BASED PRODUCTS FOR SUSTAINABLE FOOD SUPPLY

Mexico's booming agriculture industry owes a lot to the agrochemicals that enable farmers to protect crops and increase yield. Over time, the amount or dosage of chemicals needed has diminished, and the next step in this evolution is the introduction of natural, bio-based products.

Polaquimia has been supplying chemicals to the Mexican market for over 100 years, but five years ago, the company embarked on a new venture, "to move away from some of the feedstocks we used in our portfolio, into other feedstocks that have similar behavioral applications but oblige the product to be sustainable and biodegradable in the true sense," explained to Gregory Polak, Polaquimia's director general.

Polak gave the examples of Polaquimia saving over 400,000 hectares of walnut production by using bio-based products and introducing biologicals that will increase chili crops by 40% in Jalisco. "Companies need to focus on sustainability-related products now, because they will only become more relevant in the future," he added.

While many chemical organizations are increasing their bio-based product portfolios, some companies have developed innovative core product offerings that eliminate or severely reduce the need for inorganic chemicals altogether. Mexico supports a growing number of companies turning to organic biomass as an industry alternative. Acadian Plant Health, for example, provides plant bio stimulation products that improve crop growth by assisting in abiotic stress resistance and nutrition uptake through the use of seaweed-based products that are 100% organic. Acadian's crop care products are derived from a type of seaweed called *Ascophyllum nodosum* that can be sustainably harvested in cooler regions, including parts of Canada, Scotland, Ireland and Norway. The seaweed has gained such international recognition that demand currently outpaces the rate of supply. Acadian enjoyed an increase in sales in 2021 as a hungry market in the US stimulated demand, according to Latin America North director, Sergio Aburto, who also cited rising fertilizer prices: "Growers are using our products to improve the intake of fertilizer as a result of the fact that fertilizers have tripled in price since 2020 due to current transportation issues."

Seeing an opportunity for bio-based solutions within the plastics industry, CEO and founder of BioSolutions, Ana Laborde, created her own product line based on agave. With a variety of applications within the plastics industry, BioSolutions' agave fiber functions as a reinforcement within bioplastic products, replacing traditionally plastic components with renewable alternatives.

Laborde spoke of her company's deal with tequila giant Jose Cuervo as an example of engaging in a mutually-beneficial circular economy partnership, as Jose Cuervo can use BioSolutions' agave-based products, and BioSolutions can use Jose Cuervo's by-products to create something new. In summary, she said: "It puts real action behind the trend of large companies telling their customers that they care about the environment."

Although bio-based solutions are playing an increasingly important role in food supply, they still represent a small minority in Mexico's agribusiness. Furthermore, when used correctly, certain chemicals can increase the sustainability of food supply significantly. "It is important to note that no organic product can properly substitute herbicides, so adjuvants are necessary," stated Gregory Polak.

Adjuvants are a combination of surfactants, which are used as additives to boost the performance of chemicals. Polak elaborated on their benefits: "You can save 25% of the cost of active ingredients if adjuvants are used correctly, as well as saving 50% water and 50% work time, as less chemicals will need to be applied. This way, the farmer saves, the distributor saves and the manufacturer saves." ■

## PETROCHEMICALS

### As global petrochemical demand increases, Mexico's potential is not being fulfilled

The International Energy Agency (IEA) forecasts that by 2030, 30% of the additional demand for oil will come from the petrochemical industry. Looking further ahead, the IEA estimates that 55% of demand for crude oil in its net-zero scenario will come from the production of petrochemicals by 2050. In fact, in all of the scenarios contemplated by the IEA, crude oil demand from petrochemicals is expected to increase. Governments around the world, particularly in Asia, from Saudi Arabia to China, India and Indonesia, are anticipating this transition and making heavy investments towards capturing market share along petrochemical value chains.

Mexico's petrochemicals sector boasts several inherent advantages, including a sizeable domestic market, numerous chemical firms and service providers, as well as a specialized labor force. However, the AMLO administration has neglected Pemex's decaying petrochemical infrastructure, and has not encouraged the type of private sector investment that could help revive the failing state giant.

"The focus of the current government revolves around energy sovereignty, and the means to achieve this is to increase crude production and upgrade the refining infrastructure," explained Adrian Duhalt, a post-doctorate fellow in Mexican energy studies at Rice University's Baker Institute. "As a consequence, the government's decisions to allocate taxpayer's money to E&P activities and the construction of the Dos Bocas refinery have deferred any policy initiative oriented to boost the existing petrochemical assets of Pemex."

After years of neglecting its petrochemical potential, Mexico has turned into a consumer market rather than a producer market. Today, a significant share of the country's consumption of petrochemicals (and products of petrochemical origin) is sourced abroad. Duhalt noted that between 2016 and 2020, Mexico's petrochemical imports averaged US\$21.03 billion per year, a value that exceeded the US\$19.84 billion average of Pemex's crude oil exports over the same period.

While the policies of the current administration have undoubtedly contributed to the decline of Mexico's petrochemical output, the downward trend has been a gradual decrease spanning many years. Othón Canales Treviño, president of Quimi Corp Internacional, argued that Mexico's petrochemical industry was born with a bad structure due to the private sector's dependence on Pemex for raw materials. When the Mexico economy started to open up through free-trade agreements, it struggled to compete against international corporations with integrated production.

Pemex's petrochemical complexes were for the most part designed to yield and supply raw materials that other companies transform into intermediate or final petrochemical products, and its inability to reverse production declines at its facilities has had a ripple effect.

Analyzing the factors which have contributed to declining petrochemical output in Mexico, Adrian Duhalt pointed to the falling production of natural gas, as well as key inputs like methane (dry gas) and ethane, which are central for making ammonia and ethylene – the two most valuable petrochemical chains in Mexico. "In other words, financial and supply issues at Pemex not only impact its own petrochemical facilities, but also those of the private sector," he said.

An example of this impact can be seen in the case of Unigel, which used to have an agreement with Pemex to produce propylene, from



**Muthukumar Paramasivam, Business Head, Aromatics & PET – Americas, Indorama Ventures Ltd (IVL)**



**Patricio Gutiérrez, Chairman of the Board & CEO, Grupo Idesa**

which Plastiglas (Unigel's Mexican subsidiary) obtained a co-product used to produce methyl methacrylate for acrylic sheets. However, this stopped in 2017 due to a lack of raw materials from Pemex and, ever since, Unigel has had to import feedstock from Brazil.

"Being a manufacturer of chemicals or plastics, you need small amounts of raw materials which are not necessarily available locally," said Abraham Klip Moshinsky, director general of Unigel Mexico, commenting that Unigel experienced challenges obtaining some pigments in 2021, but fortunately did not have to stop production at any time. "Imported raw materials today are substantially more expensive and take longer to reach us, but there has been no shortage," he added.

The supply chain and logistics disruptions that Moshinsky alludes to draw Mexico's lack of domestic raw materials into even sharper focus. Mexico has relied on cheap imports from the US as the shale boom offered plentiful supply at competitive costs. However, in February 2021, winter storm Uri shut down large areas of Texas, severely impacting the predominant petrochemical supply chain in North America.

Sergio Paredes, CEO, of Mexican petrochemical company Resirene, acknowledged that storm Uri restricted the whole petrochemical supply chain, but also spoke of the benefits that ruptures in globalization can bring to local producers. "The logistics issues in Asia made the market more localized and gave the opportunity for local companies with production capacity such as Resirene to supply demand."

Resirene produces 200,000 tonnes per year (mt/y) of polystyrene, and Paredes noted that demand for this product improved in 2021, but inconsistent raw material supply and rising costs have put pressure on margins. "The lack of feedstock from Pemex has been a problem for five years now, which led us to stock up on imported materials, and increased logistics costs have exacerbated the situation."

### SOLUTIONS IN THE SHORT AND MEDIUM-TERM

Despite the challenges surrounding feedstock supply, 2021 was a successful year for Mexico's leading petrochemical companies. Stefan Lepecki, CEO of Braskem Idesa, and Patricio Gutiérrez, chairman and CEO of Grupo Idesa, both eulogized the strong rebound in demand that saw sales pick up significantly. In the case of Braskem Idesa, the September 2021 announcement of an agreement with Pemex for ethane supply and the development of an import terminal were major milestones that could serve as a blueprint for the type of public/private partnerships that could improve Mexico's petrochemical landscape.



Speaking of the benefits of the new addendum that sets supply of 30,000 b/d of ethane from Pemex to Braskem Idesa until 2024, and the commitment of Pemex and other government entities to support Braskem Idesa in the implementation of an ethane import terminal, Lepecki summarized: “A critical issue for the continuity of our business has been solved, and our relationship with Pemex has evolved.”

“This is a strong example of a partnership between a private company and the Mexican government, something energy pundits would certainly like to see more of,” remarked Adrian Duhalt, noting that, although the project is principally planned to increase production of derivatives at Braskem Idesa, it could also benefit Pemex and other users.

The US\$400 million investment will start up in the second half of 2024, allowing Braskem Idesa to import 100% of its needs to operate the Etileno XXI complex at full capacity, according to Lepecki, who emphasized the potential for future expansion. “We designed the Etileno XXI complex for potential expansion with low investments,” he said, explaining that the idea is to expand cracker production (the plant which transforms ethane into ethylene) by adding an extra furnace. He added: “With some minor adjustments in other equipment and in the polyethylene plants, we believe we can expand capacity by 20%, and this can be done by 2025 onwards once we have the new ethane import terminal operating.”

Although Braskem Idesa’s new agreement with Pemex is a step forward in what has been a fractured relationship since

the AMLO administration took power, the 30,000 b/d of ethane set out in the addendum is less than half of the 66,000 b/d agreed in the initial 2010 contract. This mirrors the general downward trend in domestic feedstock supply in Mexico, which until the new ethane import terminal is up and running, will be difficult to reverse. What then, can petrochemical producers do to mitigate this situation in the near term?

“The industry needs to continue exploring new logistics routes and mechanisms in order to have a more reliable supply chain in North America,” commented Patricio Gutiérrez, observing that the winter storm in Texas in early 2021 made companies rethink supply chains, moving towards a more regional version of globalization.

Muthukumar Paramasivam, business head, aromatics & PET – Americas, for Indorama Ventures Ltd (IVL), mirrored this sentiment, suggesting that deglobalization and reshoring initiatives can provide opportunities for industries in Mexico, as well as reducing the risk of external dependency.

Discussing the areas of Mexico’s chemical industry supply chain that would offer the most near-term value from an investment perspective, Gutiérrez mentioned that storage should be high on the agenda for public, private or hybrid investment. “When there is a lack of local supply, product needs to come from someplace else,” he said, giving the example of vessels that offload material into a port, which is then often moved to an intermediate tank inland before reaching its final destination. “Logistics is a broad topic which requires long-term investments, be it storage, trucking or distribution, but it is an

area that will benefit numerous industries.”

In the medium to long term, there is an overwhelming consensus that more collaboration is needed between Mexico’s public and private sectors to put the country’s petrochemical sector firmly on an upward trajectory. “We have made several proposals (to Pemex), but it has been very difficult to have follow up meetings to be able to conclude an initial plan. The private sector can help financially or through many other mechanisms, if Pemex intends to allocate its funds on priorities such as E&P,” said Gutiérrez.

Stefan Lepecki underlined the importance of having a strong Pemex, CFE and CENAGAS, because the petrochemical sector in Mexico was created based on feedstock from these national companies. However, he added that it is important to involve the private sector in the development of feedstock supply. “We hope to have an improvement in the dialogue surrounding this to find a better long-term solution. Collaboration is crucial to recover the potential of the petrochemical sector we have in this country.”

Adrian Duhalt warned that if political elites fail to grasp that the hydrocarbon industry is poised to undergo deep transformations as the transition to a lower emissions economy gains momentum, Mexico will remain a captive export market for US-based petrochemical producers. “Attention needs to be paid to global trends like the expected expansion in ammonia and plastics consumption – two value chains that happen to be the most important ones for Pemex and in which the country is heavily dependent on imports,” he said.

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## SUSTAINABLE INNOVATION

In the same vein that the future of hydrocarbon production is moving towards petrochemical products, the future of petrochemical products is increasingly focused on more sustainable solutions. Demand for traditional products such as polystyrene, polyethylene and PVC remains robust, but consumer behavior and the need to facilitate recycling are stimulating investment into greener materials.

“Each market has its own tendencies, but one common theme is that each market is looking to transition to new generations of eco-friendly and sustainable products,” commented Felipe Varela, director general of Grupo Dynasol, the company founded as a joint venture between Repsol and KUO Group, which produces around 500,000 mt/y of synthetic rubber from sites in Spain, Mexico and China.

Expanding on Dynasol’s innovation process, Varela explained the company’s technology team develops solutions considering social and environmental impacts, giving the example of Dynasol’s high vinyl SBS solution for the resource-intensive asphalt industry. “The high content of vinyl helps the tar crosslink process which allows the removal of sulphur and its

H2S toxic emissions. It also reduces its energy requirements due to lower viscosity and increases the durability of the asphalt mix and its compatibility with different quality tars.”

Indorama Ventures Ltd (IVL), the world’s largest PET resin producer, has recycled close to 70 billion PET bottles since 2011, according to Muthukumar Paramasivam, who added that this figure will increase to an additional 50 billion bottles recycled per year by 2025 on the back of a US\$1.5 billion investment by the Thai company.

Paramasivam praised IVL’s Mexican operations as being pioneering in the company’s recycling efforts. “The PET bottles that are turned into flakes at our facility in Guadalajara, are used in our Querétaro plant to be turned into pellets,” he explained. Expanding on the topic, Paramasivam detailed IVL’s 2021 Earth Day launch of the industry’s first certified, carbon-neutral PET pellets, made with renewable energy, locally-sourced materials and low-impact water transport. “Any residual emissions are offset by water and forestry projects that directly benefit the well-being of communities and environment.”

Mexican company, Industria Química del Istmo, S.A. de C.V. (IQUISA), produces chlorine, hydrochloric acid, sodium hydroxide, po-

tassium hydroxide, and sodium hypochlorite from three production plants. In January 2021, construction began at the company’s caustic soda plant in Coatzacoalcos, which will increase the facility’s annual capacity by 150,000 mt/y, and is due to be completed by the third quarter of 2022, according to Jesús García Saíd, IQUISA’s director general.

IQUISA uses a particular membrane technology that increases efficiency in the production of chloride and soda, which differs from traditional technologies for the production of chlorine that relied on mercury, posing health risks. García Saíd explained how IQUISA’s membrane technology works: “Essentially the membrane works inside of the cell, separating the chlorine on one side and caustic soda and hydrogen on the other side. This separation produces the hydrogen as a byproduct. The whole operation is much greener because we rely on far less hydrocarbons to power it.”

The variety of sustainability-focused initiatives being implemented by both international and national petrochemical companies in Mexico illustrates the path the industry is taking. For the country to unlock the value of its natural resources, government action must now follow and embrace the future instead of focusing on State-led hydrocarbon development. ■



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## AGROCHEMICALS

### A booming export market stimulated by technology

Pick up an avocado in a North American or European grocery store and the chances are that the sticker will reveal its Mexican origins. This is no coincidence – Mexico’s agricultural companies spent years investing in campaigns to market the high-value crop to foreign consumers, ultimately quadrupling the country’s total export volume of avocados from 1990 to 2016. Across a plethora of products, the Mexican agriculture industry continues to grow to satiate the appetite of a rising global population.

Mexico, currently the world’s seventh largest producer of agricultural products, has the benefit of plentiful labor and relatively low production costs. Perhaps more importantly, the country enjoys a diversified climate that supports year-round growth. Plentiful high-quality harvests have led to a surge in foreign demand for high-margin Mexican produce like avocados, tomatoes and berries. The country is now the third-largest agricultural trading partner with the US, having increased the amount of exports to its northern neighbor by over 400% over the past twenty years and totaling US\$33 billion in 2020.

In contrast to Mexico’s petrochemical industry, which has become a net importer, Mexican food exports achieved a US\$12.3 billion surplus in 2020, exporting US\$40 billion compared to US\$27 billion in imports.

“Besides Mexican agriculture aimed at the national market, which consistently increases proportionately to the population, high-tech production aimed for the export market, which is so important for the country’s GDP, has been very dynamic and increased yearly,” observed Fernando Vera Hernández, director general of Grupo Versa, noting how investment has greatly professionalized Mexico’s agriculture industry.

### EMPOWERING FARMERS TO TACKLE FOOD SECURITY

Technology and training have been the pillars of Mexico’s agricultural evolution. Javier Valdes, managing director of Syngenta Mexico, reflected on how innovation has revolutionized the sector: “When I started in this industry, farmers weeded corn crops manually with a hoe, which was laborious work that took up weeks. Syngenta made a technological transformation by changing manual control to herbicides. Now, with a sprinkler backpack the farmer can control one hectare in a day without help.”

Valdes pointed out that this transformation means farmers can spend more time on other economic activities, and also highlighted its positive ecological impact. He compared the minimal impact of current processes to the previous manual control which moved the soil, and with the rains, that loosened soil ended up in a river or the sea.

Indeed, as well as being the unseen agents that make Mexico’s agro-export economy scalable, agrochemical technologies play a key role in the sustainability of farming. With the same amount of land, producers are tasked with increasing their yields in a way that will not deplete the environment for future harvests.

“By 2050, we need to increase our crop productivity by 70% in the field. We do not have enough additional land to do that, so we need to think about how to increase productivity,” said Marco Salcedo, director general of AMVAC in Mexico.



**Luis Eduardo González, President, The Mexican Union of Agrochemicals Manufacturers and Formulators (UMFFAAC)**



**Cristian García, Executive Director, Association of Crop Protection, Science and Technology (PROCCYT)**

AMVAC is reviewing its portfolio to see which products can be replaced in the future with new technologies: “For example, we just launched an initiative called Smart Soil, which combines chemical and biological concepts to help prevent soil depletion and improve control of specific problems, such as Fusarium in agave.”

Carlos Jurado, Latin American North business director at FMC, revealed that the company aims to have completely sustainable products by 2025, and intends to double its current US\$9 million per year sales in biologicals in the next three years. He underlined the importance of making synthetic chemistry and biologicals work in unison: “Nowadays all farmers are combining both technologies, and that is something we need to take advantage of.”

Citing some of the products FMC plans to launch in Mexico in 2022, Jurado gave the example of Arc, a technology that predicts insect pressure, which won the best farm intelligence platform at the Crop Science Forum & Awards in 2021. “It is an app that brings together different technologies for the farmer, including weather, satellite monitoring and monitoring with traps, to help produce better harvests and make better decisions in the rational use of agrochemicals. For example, it has heat maps that indicate when the biggest larvae explosion of cotton bollworm in corn will occur.”

The Arc platform is already being used in Brazil, and testing in Mexico began in Sinaloa in November 2021 with the Mexican launch due in 2022.

Ana Claudia Cerasoli, president of the Meso-Andean region for Corteva Agriscience, an NYSE-listed company formed as a result of the merger between DuPont Crop Protection, DuPont Pioneer, and Dow AgroSciences, spoke about Corteva’s mission to “empower farmers to tackle food security”. The Global Food Security Index (GFSI), developed by Economist Impact and sponsored by Corteva, measures the level of food affordability, availability, quality, safety, and more recently, natural resources and resilience across various countries. Research by the GFSI found that during the past 10 years, Mexico has improved its availability of food significantly, but there has been a decrease in accessibility, mainly due to the average cost of food and farming in the country.

“Corteva understands that its innovation should be focused on understanding the challenges farmers face in the field,” stated Cerasoli, explaining that the company’s Latin America HQ in Guadalajara and five R&D centers in Mexico look to develop products that are best adapted to agricultural conditions in the region.

She gave the example of Salibro, a new nematocidal Corteva is planning to launch in 2022: “Salibro controls parasitic plant nema-



**Carlos Jurado, Latin American North Business Director, FMC**



**Marco Salcedo, Director General - Mexico, AMVAC**

todes and helps support a healthy crop root system. This is critical to maximize water and nutrient utilization and provide the opportunity of realizing yield potential in the crop.”

Nery Echeverría, Bayer Crop Science’s head of sales for Mexico, noted that a great deal of the company’s research generated in Mexico is exported to other countries. Explaining how Bayer Crop Science’s global research on seeds creates applications based on each country’s needs, Echeverría gave the example of Short Stature Corn, known in Mexico as Vitala System: “It is a hybrid with a specialized architecture that provides more lodging resistance and higher optimization of ground and water use. This contributes to sustainability by producing more tons per hectare, while other technologies provide more efficient water use.”

In addition to producing more tons per hectare, Bayer Crop Science’s agrochemical and biological products follow the trend of looking to reduce the chemical load necessary. Echeverría summarized: “Less chemicals per hectare makes for more sustainable production.”

“The use of nutrients and plant growth regulators have been developed and researched a lot more these past few years by plant physiology researchers,” commented César Parada, director general of Valent de México, the subsidiary of Valent USA, which was formed

through a joint venture between Sumitomo Chemical Company and Chevron Chemical Company.

Parada explained that Valent’s Plant Intelligence concept develops the potential of crop production using nutrition and bio-stimulation products. “It has allowed us to offer distributors and the people who take care of the crops additional tools like amino-acids and nutrients to help fight the stress a plant suffers and achieve a better yield.”

The development of new technologies would be obsolete without successful adoption in the field, and to this end, collaboration throughout the agricultural value chain is necessary. Jorge Alfredo Casas García, director general of commercialization and marketing at distributor Agri Star México, spoke of the role distributors can play to facilitate technology transfers in the industry. Agri Star has been providing farmers in the less developed southeast of Mexico with access to technologies and training for corn, beans, sugar cane and vegetables so they can produce more from their land. “One of the challenges we faced is that farmers tend to be older folk who manage their production with their own traditional parameters and have a limited acceptance of new technologies. With this in mind, we looked for projects with more short-term impact to display benefit quickly, which are more likely then to be adopted,” explained Casas.

He gave the example of corn seeds; to go from a creole seed to a high-performance seed for a reasonable cost Agri Star gathers evidence for the farmer to compare and understand that if they invest more they can get a higher profit. “We are seeing regions making progress on this front, as is the case of Oaxaca, that is moving from corn to agave for the production of mezcal.”

## CUMBERSOME GOVERNMENT REGULATIONS

Having conducted interviews with many of the leading agrochemicals producers, distributors and associations for this report, the consensus amongst interviewees is that the industry has been growing in spite of government regulations – one of the largest factors slowing the growth of Mexico’s agribusiness. Within the AMLO administration, various governing bodies direct agrochemical policy. While the Federal Commission for the Prevention of Health Risks (COFEPRIS) authorizes the use of particular substances within the country,

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it is the role of the Agriculture and Rural Development Secretariat (SADER) to design agricultural policies that influence the use of these agrochemicals.

Within Mexico's agribusiness, the prevailing sentiment is that these bodies operate with considerable delay in processing registrations for the use of new chemicals. Grupo Lucava's president, Manuel Gurrola, pointed to the inefficiencies within COFEPRIS' operations in particular. Grupo Lucava has over 40 submitted applications awaiting COFEPRIS approval, and Gurrola voiced his frustration: "This slows down the whole industry and plays to the detriment of the Mexican field because products like glyphosate are not allowed in, even with all the permits in order."

Cristian García, executive director of the Association of Crop Protection, Science and Technology (PROCCYT), an organization that represents 70% of the crop protection industry in Mexico, commented that glyphosate is an agricultural tool that has been used in Mexico for over 40 years. "Like other crop protection products, it was subjected to many years of investigation and rigorous analysis from authorities in human health, environment health, and agricultural health," he said, noting that even agencies with very strict requirements, like the FDA (Food and Drug Administration) and EPA (Environmental Protection Agency), have tested glyphosate without finding any harmful side effects.

The only other country that prohibits the use of glyphosate is Vietnam, which does so on religious grounds, and García lamented misinformation being spread by activists who started a campaign against this molecule and other pesticides. "These activists are acting in favor of what they call 'agro-ecology,' meaning the use of only

organic and biological products, which are not bad in themselves but fail to present the only solution for the agricultural industry."

Luis Eduardo González, president of the Mexican Union of Agrochemicals Manufacturers and Formulators (UMFFAAC), weighed in on the subject, commenting that the industry lacks clearly defined laws and guidelines that allow agrochemical players to access new molecules internationally, which would offer farmers more sustainable alternatives and more economically viable products: "The federal government has limited the budget, but this would not be a problem if private industry had the access to the tools for pest and disease control verified, certified and regulated faster and with clearer norms."

A common theme amongst chemical manufacturers is that the AMLO administration bases its policies more on ideology than on research-driven findings. Fernando Hernández of Grupo Versa feels the government fails to understand the value of agrochemicals within the overall food chain: "I like to compare our industry with the pharmaceutical industry. If you are not sick, you do not need medicines, but when you have some illness or condition, you need to find a solution. It is the same with plants. However, medicines are widely approved while agrochemicals are not."

## COMBATING THE USE OF ILLEGAL PESTICIDES

For the Mexican government to more effectively regulate its agrochemicals industry, a greater emphasis on combating the widespread use of illegal pesticides is necessary. Luis González of UMFFAAC articulated his concern on the serious damage illegal agrochemicals are causing the country: "Authorities are not taking it as the national security issue it is because their priorities are Covid and other political issues. Regarding the vigilance and prosecution of the illegality of plant protection products – they have done nothing."

González warned that the government's neglect of the subject could risk Mexico's position as an agriculture exporter, giving the example of Costa Rica's previous problems with cantaloupe melons that stopped them trading that product for several years.

To illustrate the prevalence of the issue, Nery Echeverría of Bayer Crop Science detailed that over 15% of the agrochemicals used in Mexico are estimated to be illegal, representing over US\$200 million per year. He reflected: "This seriously harms the farmers' productivity, the whole industry chain, the environment and the consumer."

Francisco Ortiz, general manager of Altiara, a Mexican producer of adjuvants and bio stimulators, explained how government actions have actually contributed to an increased use of illegal agrochemicals in recent years: "The government halted its operations against companies that sell without a COFEPRIS authorization around three years ago. As a result, this market has multiplied. Each year we hold a census at Amocali to legally and ethically collect containers; we have discovered around 500 companies selling unregistered products, which represents a real health risk."

While acknowledging that government inaction is partly responsible for the spread of illegal pesticides, Arturo Quijano, operations director of ANAJALSA, also pointed out that suppliers from foreign countries like China and even consumer behavior also play a role. "The final consumer knows perfectly well when they are buying an illegal product because the price is much lower than an alternative product that complies with regulations."

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Quijano believes that the problem stems from a lack of education, as many people do not realize that this behavior hurts everybody. “At the end of the day, we all consume food. The food we eat could be produced with these illegal products. Culturally, we do not acknowledge the consequences,” he said.

## RISING FERTILIZER PRICES HIGHLIGHT THE NEED FOR FEEDSTOCK DEVELOPMENT

The scarcity of raw materials for the chemical industry is widespread, but perhaps the most concerning lack of feedstock relates to fertilizers – a global issue already causing food shortages, which has showed no signs of abating in 2022. The World Bank’s Fertilizer Price Index saw an increase of 163.9% from January to December 2021, reaching its highest level since 2008.

Fertilizers are a means to multiply the production of grains, oleaginous plants, and ultimately livestock and derivatives. The breadth of food production enabled by such fertilizers – from crops, fruit and vegetables to plants, meat and dairy – illustrates the importance of maintaining a solid supply of feedstock. When events cause global supply chains to falter, this importance is magnified.

“30 years ago, Pemex used to produce a surplus of sulfur, a basic raw material, and ammonia. Unfortunately, nowadays we have a deficit in both raw materials,” lamented Nicolás Xacur, director general of Mexican fertilizer producer Agrogen.

To paint the current picture, Xacur recalled the days he started the business when Mexico produced 1.1 million mt/y of sulfur; half a million tonnes of which were destined for the local market, with the rest being exported. “As for ammonia, in the petrochemical complex in Cosoleacaque, Veracruz, enough ammonia was produced, and some surplus was exported.”

Today, Mexican production of sulfur has dropped to between 250,000 to 280,000 mt/y. For ammonia, Cosoleacaque produces intermittently and in very small amounts, which forces companies to import from the gulf coast of the US, increasing the costs of production. “If raw materials have to be imported to later export the finished product, profits are marginal.”

Rocío Gaytán, commercial director of Fefermex, another of Mexico’s fertilizer producers, analyzed the fundamentals that have caused fertilizer prices to skyrocket. She explained that in 2021, natural gas contracts in Europe and the US that were not covered caused the closure of several factories that produce some highly necessary fertilizers, resulting in higher prices for new agreements. Other products like phosphor and potassium chloride also suffered shortages and sharp price increases.

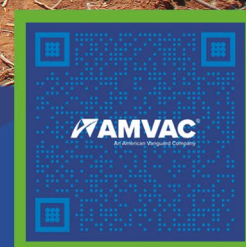
Gaytán voiced her concern that most Mexican farmers do not have the liquidity to buy the fertilizers at these prices. “If they buy supplies at these prices and the market changes before they sell their products, they could go broke.”

Looking ahead, Gaytán warned of the consequences: “This is a global situation, and it is clear that a lack of fertilizer production and high prices will result in a shortage of food products.”

To conclude, Luis González of UMFFAAC stated that better education is needed regarding where food comes from, with real, scientific basis: “The pandemic made it clear that the food industry is far more important than any other. For instance, oil will eventually lose importance and run out, but people will never stop eating.” ■



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## SPECIALTY CHEMICALS

### Searching for healthier margins: The transition to specialty products gathers pace

A common theme in GBR's chemical industry reports around the world has been the quest for an increased participation in the specialties space, and Mexico is no exception. Commodity chemicals that are made in bulk to satisfy global markets require a level of scale to be profitable, meaning only the largest companies with access to cheap raw materials can compete. Considering Mexico's lack of domestically-sourced feedstock, many chemical companies prefer to focus on higher-margin products that require specific expertise, rather than scale, to sell.

"You need a different way of thinking and a different way of doing business when operating in the specialty space, as the value add is different," said Maggie Gómez-Rábago, director general of Charlotte Chemical, observing that with commodities, having the product available at a good price and in large volume are the most important factors, whereas with specialty chemicals you need to be more technical. "Charlotte Chemical's entire sales teams are chemical engineers as they need to understand the product and be able to recommend the best solutions for each customer's needs."

Gómez-Rábago also underlined the need to be patient in the specialties space, giving the example of two products Charlotte Chemi-

cal launched in 2021, that she expects will take approximately two years to gain traction: "People want results fast in the commodity market, but with specialty chemicals, both time and money must be invested before seeing results."

This sentiment was echoed by Luis Espinoza Rueda, director general of PROQUIPUSA (Productos Químicos Industriales de Puebla S.A. de C.V.), who remarked that, when it comes to certain commodities, extremely big joint ventures makes it almost impossible to compete, so smaller companies are moving into the specialty space which offers a more sophisticated way of selling and a more stable commercial relationship with clients. "In the specialty space, clients rely more on your knowledge and technologies, rather than on price only. The market differs from the traditional way of selling and the sales term for specialty chemicals can be as long as two years."

The number of business verticals available in the specialty chemicals market is also attractive, as companies look to diversify their portfolios or move into areas that offer more growth opportunities. French company SNF Floerger, for example, produces approximately 50% of the world's polyacrylamide, but does not expect to see growth in this market in the first half of 2022 due to complications in ground and maritime transportation, according to Julio Rubio Padilla, the company's director general in Mexico. "The company is diversifying its portfolio based on acrylamide chemistry," stated Padilla, in areas such as inorganic and organic coagulants, personal care and home care.

Using the versatility of chemicals to branch into different sectors was a theme discussed by Isis Hernandez, commercial manager of Mexican company Macropol. Hernandez described the evolution of Macropol, initially focusing on additives for PVC transformation,



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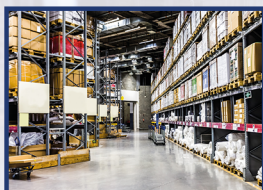
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before entering other additives such as polyolefins, engineering plastics and cosmetics. She explained that depending on its application, the same material can be classified by its utility in different ways: “For example, a process additive is the one that helps to save on production, and the functional ones generate a property or main characteristic in the plastic. For the pharmacy and personal care sectors, we have emollients, emulsifiers and surfactants.”

## PHARMACEUTICAL DEVELOPMENT

As the Omicron variant caused global Covid cases to reach record highs in Q1 2022, the profits of big pharma companies manufacturing vaccines rose in tandem. Figures from the Peoples Vaccine Alliance in November 2021 revealed that the companies behind two of the most successful vaccines — Pfizer, BioNTech and Moderna— made combined profits of over US\$65,000 every minute in 2021.

Since signing a contract to supply components for Pfizer’s Covid vaccine in November 2020, British specialty chemicals multinational Croda has announced record profits (H1 2021) and has expanded manufacturing facilities to meet demand. Rafael Méndez, Croda’s regional director – Latam Northern Tier, mentioned: “The company aims to accelerate in the prescription drug and vaccine areas,” adding that the personal care and healthcare markets in Mexico have contributed significantly to the company’s record sales.

Although unprecedented vaccine production has stimulated one sub-segment of the pharma chemicals space, the sector has not been without its complications in Mexico. Martín Toscano, president of Evonik Industries Mexico, revealed that of all the market segments Evonik serves in Mexico, the one that struggled the most in 2021 was the pharma industry. “The new government regulations did not attain the desired results when it comes to medicines being acquired to support the national public health system. In fact, the regulations resulted in an even more inefficient value chain,” he said, clarifying that this is a Mexico-specific situation that does not apply to Evonik’s global pharma business.

“A big portion of the pharmaceutical industry depends on tenders, which were drastically reduced from previous years,” commented Alonzo Autrey, managing director of distributor, DVA Mexicana.

Considering the need to ensure a consistent supply of chemicals to the pharmaceutical industry, many pharma companies have dedicated chemical manufacturing subsidiaries. One such company is Signa, the Mexican subsidiary of Canadian generic drug maker Apotex. Carlos Villalobos, Signa’s VP and general manager, highlighted three chemicals that play an integral role in pharmaceutical development: “Paclitaxel, a chemotherapy medication used to treat a number of types of cancer; Sitagliptin, for the treatment of type 2 diabetes; and Aripiprazole, for the treatment of schizophrenia and bipolar disorder.”

Speaking of demand trends for pharma chemicals, Villalobos mentioned high potency organic synthesis and API type of products, as well as the rise of biological products.

Croda’s Méndez also emphasized the importance of this trend, revealing that 65% of Croda’s raw materials currently come from bio-based resources, and the company wants to increase this percentage to 75% by 2030.



**Maggie Gómez-Rábago, Director General, Charlotte Chemical**

## LUBRICANTS BOUNCE BACK DESPITE AUTO INDUSTRY STRUGGLES

Mexico’s automotive industry has been one of the bedrocks of the country’s economy for over a century since Buick became the first car producer to be officially established in Mexico back in 1921. As the country signed multiple free-trade agreements in the era of globalization, Mexico’s open-door arrangement with European and Asian automakers to produce vehicles that are sold to the US helped solidify the sector. Then Covid happened.

As an essential industry, the chemical industry has been resilient throughout the pandemic, but the automotive sector (a major chemical industry client) was not as fortunate. Global lockdowns in 2020 saw highways deserted while populations worked from home, then, when businesses reopened, an unprecedented shortage of semiconductor microchips has severely constrained the production capabilities of vehicle manufacturers.

“Several automotive manufacturers are now thinking of 2022 as even more complex than expected because of the issues with raw materials,” revealed José Luis Guzmán, director general of Castrol México.

Nevertheless, Guzmán went on to say that Mexico’s economic stability for 2022 looks good for lubricant suppliers such as Castrol: “The large vehicle fleet in the country (the second largest fleet in Latin America) offers room for expansion in the used car market.”

Indeed, despite the well-documented challenges the auto-industry is facing, lubricants was the segment of the chemical industry that experienced the most growth in 2021, according to Miguel Benedetto, director general of Mexico’s National Chemical Association (ANIQ). This was partly due to a heavy decline in 2020, but also because consumers decided to keep old cars running longer. “New car users have their oil changed with their dealers; so, demand from those dealers has fallen, but only by 10% for Castrol. For lubricant providers, I believe the impact of low new car sales will be felt more in 2023,” detailed Guzmán.

One of the conundrums facing the lubricants space is sustainability. Firstly, how to adapt to an automotive industry moving towards electric vehicles? And secondly, how to reduce the carbon footprint of energy intensive processes? “We have a facility in Altamira that produces additives for lubricants and rubber in a process that requires a lot of water,” said Pedro Bojacá, managing director in Mexico for German specialty chemicals company, Lanxess. “We recently completed a project using treatments that let us recycle this water back into production. So far, we have seen an 85% reduction in water consumption here.”

Héctor Sánchez Rivera, director general of Polylubex, the Mexican company focused on elastomers and lubricants, commented that Polylubex sees considerable growth potential in the area of synthetic lubricants. “These are better for the environment and drastically improve the performance of machines,” he said, noting that some can even be recycled. “We are working with two European companies that have developed new products in the synthetic lubricant space that we would like to bring to Mexico and Central America.” ■



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## PAINTS & COATINGS

Demand for paints and coatings in Mexico has remained robust throughout the pandemic. Arius Enrique Zúñiga Lara, president of the National Association of Paints and Inks Manufacturers (ANAFAPYT), commented that Do-It-Yourself trends saw sales of paints and emulsions increase in this sector by 20% in 2020, as workforces migrated in their droves to home office environments. In 2021, the government's investment into public works caused the construction industry to rebound, with Zúñiga Lara revealing that the organizers of a project to recover the Train Maya reached out to ANAFAPYT to see which members would be interested in supplying paints and coatings for the project.

The challenge has been keeping up with demand due to a severe lack of raw materials. This is a global issue, illustrated by BASF's announcement on December 1st, 2021, that it would raise prices for its additives for paints and coatings products up to 35% to compensate for surging raw material, transportation and energy costs, as well as other rising costs including labor, packaging and maintenance. Although the challenge of raw material availability has escalated on a global scale, Mexico's feedstock scarcity had been apparent long before the pandemic, and has become even more acute in the two years since.

Francisco Rubio, president of Mexican distributor Kemikals, observed that there was not a single product that did not suffer more than one price increase throughout 2021, suggesting that surging costs caused the market to prioritize availability over sustainability. One of the predominant themes influencing the direction of the industry in prior years had been the volatile organic compound (VOC) regulations for architectural coatings, which is still an area of focus. However, "The trend of looking for increasingly greener products switched to survival mode", stated Rubio.

Elaborating on these changing dynamics, Rubio remarked that Kemikal's slogan, 'We are committed to sustainable innovation', was developed three years ago when the world was different, as new lines were brought in incorporating VOC-free products. "We have continued to keep pushing these products, but in the current market conditions, customers will buy whatever is available to avoid stopping production."

This sentiment was echoed by Moises Silva Perez, business manager of Pyosa Industries, who emphasized his company's commitment to sustainability, but commented on the present-day realities of the sector: "If somebody wants to paint their house, for example, they

tend to prefer the cheaper paint over the ecological one. While Pyosa is prepared to supply a quality product to manufacturers, some do not buy it because it is not attractive to their end customers."

Explaining how ANAFAPYT can assist its members meeting VOC regulation standards, Flor de María González Mariblanca, director general, said the association has certain recommendations, such as a ban on the intentional use of paints with lead. "We are also promoting certain requirements that relate to environmental protection," she added.

## CREATIVE SOLUTIONS

ANAFAPYT is hopeful that paints and coatings prices will start to fall in 2022 as supply chain bottlenecks ease, according to president Zúñiga Lara, but he acknowledged that prices will not go down to what they were in 2019.

An example of the creativity needed to confront the current situation was given by Jorge David Saldaña, chief strategy officer of Wyn de México, who noted a number of clear purchasing trends that show how sustainability and cost efficiency can align. "Because regulations are becoming stricter on solvents, there is an increased demand from customers now turning towards water-based products," said Saldaña. "We are also working on reducing the amount of water in our formulas given current logistics challenges. Customers who might have previously asked for low-solids material now want higher concentrations expecting that they will add water in their own facilities."

Of course, the sustainability of a business is not only linked to product availability, a point raised by Patricio Cueva, CEO of Reacciones Químicas, who emphasized that his company takes a holistic approach to sustainability and aims not only to include it in its products, but also in its operations. "Since 2017, up to 80% of our electricity comes from wind energy. We are also currently in the process of installing over 2,000 square meters of solar panels on the roofs of our warehouses, which will generate approximately 470,000 KW/h of energy per year."

As a result, Cueva revealed that Reacciones Químicas has managed to reduce its CO2 emissions by over 2,000 tons per year, and one of the main focus areas of its R&D team has been to incorporate recycled raw materials into its processes.

While current consumer demand may prioritize price and availability, the long-term trend of sustainability remains undeniable. The balancing act of how to consider both is the challenge that companies must negotiate in 2022. ■

## DISTRIBUTION

### The chemical industry growth segment is particularly relevant in Mexico

Latin America has a thriving chemical distribution segment. The complexity of the region in terms of distances, currency volatility and political turbulence means that, although international manufacturers want to sell in the region, they prefer to do so via distributors with local knowledge. In Mexico, the role of the distributor has become even more relevant due to the demise of Pemex’s petrochemical output. The country has become a captive market for US imports, and dependency on imports implies a need for logistics, storage, technical and value-added services.

“Because Mexico has reduced its production of chemical and petrochemical products, distributors now have more business opportunities,” said Alfredo Ison, executive president of Química Delta, who observed that the country used to produce about 200,000 mt/y of base oils, but now Pemex produces none. “Foreign producers fill this void, and most of these producers rely on distributors to promote and sell their products to the Mexican market,” observed Ison.

Eugenio Manzano, executive director of Pochteca, commented that Mexico’s geography with more than 4,000 kilometers from north to south, hundreds of small and medium cities that host thousands of



**Eugenio Manzano, Executive Director, Pochteca**

companies involved in manufacturing, food processing, household and personal care, coatings, mining, and other chemical consuming industries, would be extremely costly to serve directly by manufacturers. “Cultural differences and local idiosyncrasies would also be difficult to understand,” he added, citing these as some of the factors which have resulted in Mexico supporting an ecosystem of hundreds of chemical distributors that provide local warehousing and services.

“However, as our industry becomes more competitive, regulatory requirements raise the bar, digitalization becomes key and economies of scale determine a distributor’s ability to survive and thrive, we can expect the industry to consolidate,” reflected Manzano. He noted that consolidation will reduce complexity

for suppliers as they will be dealing with a lower number of more competitive distributors, which in turn will be able to deliver standardized and more efficient services.

Alveg, the distribution arm of Grupo Idesa’s petrochemical business unit, experienced an excellent year in 2021, according to Patricio Gutiérrez, Grupo Idesa’s chairman and CEO, who cited strong demand from industries including US construction and high oil prices leading to improved margins as factors contributing to the success. Echoing the sentiment of Pochteca’s Manzano, Gutiérrez suggested that consolidation in the distribution segment would benefit the sector so as to be able to implement best industry standards and practices: “This is also linked to sustainability, as consolidation will lead to more professional and responsible distribution. The local distributors are moving



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towards that direction, but consolidation led by companies such as Alveg (Idesa's distribution arm) can raise the level of the segment and make it happen faster."

Ricardo Méndez Pastrana, director general of Mexican distributor PromaPlast, gave his thoughts on why a wide variety of distributors have been able to successfully coexist: "The reason why there has not been consolidation in Mexico, which in theory we should be seeing, is because end-users, transformers and consumers are still very much atomized," concluding that, while distribution continues to be a very important channel for large producers serving the Mexican market, in order to serve small companies, you also need a number of small distributors.

## AVAILABILITY, THE PRIORITY IN AN OPPORTUNISTIC MARKET

The biggest challenge for chemical distributors in 2021, which looks set to continue for at least the first half of 2022, is product availability. The supply chain tightness and logistics bottlenecks that characterized 2021 became even more acute at the start of 2022, as the Omicron variant caused many North American workers to isolate.

Alonzo Autrey, managing director of DVA Mexicana, spoke of the complexities of planning in the current market, citing the response time for sudden changes in demand as particularly challenging. "We may speak with a client who tells us they do not see future demand for a product on a Friday, and on Monday put up an order 20% to 30% higher than usual," he said, noting that the onus is on distributors to closely monitor market demand to ensure a quick response time.



N. Adriana Ramírez Millán, Chemical Sales Director, Helm de México



Miguel Valdivia, Commercial Director, Trade Chemicals & Products

In the pharmaceutical sector in which DVA operates, this is especially pertinent to help clients deliver products to health centers, clinics and government institutions.

Helm de México, part of the German multinational chemical distribution and services company, distributed around 90,000 tons of products in Mexico in 2021, compared to 70,000 in 2020, according to chemical sales director, Nancy Adriana Ramírez Millán. She detailed that the company has agreements with suppliers to mitigate the impact of logistics price increases, but the biggest challenge in 2021 has been delivery times, with lead times for some products having tripled. "Far from the just-in-time model the industry was used to, companies had to stock up to cover themselves," she said, revealing that freight rates from China increased four to five-fold.

"Today (November 2021), we are planning for materials that will arrive to Mexico in three to four months, accepting that freights are not changing," acknowledged Ramírez, before reassuring that Helm's clients will not be as affected by these external factors because of the company's logistics network and stock of solvents and solids. "The critical situation in product availability and rising demand has caused clients to realize that having stock is the number one priority. Some clients are even changing their formulas or developing new materials to make up for these adversities," added Ramírez.

Arturo Hoyo, vice-president product line manager – North America at Nexeo Plastics, described 2021 as a "bittersweet" year for the company, as it achieved a record year in terms of growth, but faced a number of serious challenges. Hoyo cited the storm in Texas in February 2021: "Winter Storm Uri collapsed almost 70% of the petrochemical production capacity in North America," in combination with the pandemic, as the two major factors impacting the distribution supply chain in Mexico.

"The company made investments to create a network that would enable us to be more agile when it comes to importing and exporting products," stated Hoyo, elaborating: "For instance, we compensated shortages caused by the storm by opening new channels and bringing in products from South East Asia to Mexico's Pacific coast."

Jorge Molina Martínez, director general of HJB Química Internacional, also mentioned the Texas frost when discussing how supply of certain materials has become expensive and delayed. "An important volume of our company has to do with a molecule that in Mexico is only produced by Pemex: ethylene oxide," he explained, noting that HJB Química leverages its raw material supply in the US from big manufacturers such as Indorama, Sasol, Ineos, Dow and Shell. "A strategy that helped us a lot was to have a high availability. HJB used all its financial tools to double its inventory, thinking of what happened in February in the US."



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While the lack of feedstock availability is well documented in Mexico, Martínez reflected that global market volatility can cause an over-supply of some raw materials. “Domestic market leaders such as Henkel, Colgate, P&G, and Corona have the financial capacity to double their inventories, which puts stress on supply and demand,” he said, explaining that this complicates availability for small and medium companies. “When you have over-inventory, you stop ordering and when the inventory runs out you realize that this product will take 2 or 3 months to arrive and it is too late to order it. Timing purchases is crucial.”

## INNOVATION, TECHNICAL AND LOGISTICS SERVICES

Competition in the distribution space has led to companies integrating additional services to act as one-stop-shop solutions for international chemical producers looking to sell their products in a country or region. The onset of the pandemic accelerated this trend, as logistics bottlenecks worsened, and foreign technicians were unable to travel to sites to offer support. Today, distributors that can cover all bases for their clients and suppliers hold a strategic advantage.

One such company is Quimi Corp Internacional, an innovation-focused company which distributes antioxidants, flame-retardants, UV stabilizers, internal lubricants and polymers. Company president Othón Canales Treviño stated: “Innovation differentiates us from our competitors, adds value for the client and, if everything goes right, makes the client buy based on value and not cost.”

He went on to provide an anecdote of when his company visited Pemex’s polyethylene facilities and noticed that they had a smaller plant to produce the catalyst, mixing aluminum alkyls with titanate and other

dangerous materials. Quimi Corp then offered to develop the catalyst, in collaboration with Albemarle Corporation, and send it to Pemex assembled in tank trucks. “This way Pemex eliminated the operation risk for that plant by eliminating the blending of dangerous products and improved their operation by eliminating variations they had in their catalyst production which provoked variations in the production and quality of their polymer,” explained Treviño. “For Quimi Corp, it meant instead of selling a cheap product, now selling one 20 times more valuable.”

Miguel Valdivia, commercial director of Trade Chemicals & Products (TCP), the Mexican distributor that works with companies such as Polaquimia, COPAMEX and Stepan, highlighted that TCP employs chemical engineers experienced from Wacker and Clariant, as well as a doctor of science, and believes this in-company knowledge helped TCP increase sales. “Now that there is a shortage of many raw materials, we are supporting customers to replace products that are not available so they can continue with their processes,” said Valdivia, who gave an example of sending a specialist engineer to Culiacan, Sinaloa, to help a fertilizer manufacturer that could not find citric acid replace it with a different product.

Another critical area of business during the pandemic has been logistics. Luis Manuel González, director general of Lub Line Mexico, a distributor that sells raw materials, lubricants and specialties, revealed that the company has redesigned its plan for 2025 and one of the pillars in this new strategy is to become a provider of logistic services in the industry. “We recently incorporated a new route through the Gulf of Mexico which saves us a lot of time and money to import materials, which translates into a competitive cost advantage,” said González, adding that the infrastructure at Lub Line’s Mexican plant allows access to multi-modal logistics, including a railway, trucking yard and packaging stations. ■





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# LOGISTICS

## Learning from the bottlenecks that defined 2021

Logistics disruptions entered the mainstream sphere of consciousness in 2021, as empty shelves in supermarkets and gas stations without fuel demonstrated the impact that ruptures to a finely-tuned global supply chain can cause. For heavy industry, a lack of shipping vessels to meet demand resulted in severe delays in receiving imports, and new builds are not expected to come out of the shipyards until late 2022 at the earliest.

Martin Sack, regional head of the Americas for Leschaco, expects logistics disruptions to remain a challenge for at least the first half of 2022, and suggested the situation could worsen due to the spread of the Omicron variant across the globe. Although logistics specialists such as Leschaco are well prepared to mitigate the impact of the pandemic at their own operations, issues can arise when the value chain is reliant on third parties. “What concerns us more are the essential and critical services of carriers, port terminals and trucking companies. Increasing infection numbers might cause further delays, congestions and shortages within the global supply chain,” explained Sack.

Mexico is fortunate that its geographical position – including a 3,145 km land border with its largest trading partner, the US – and 13 free-trade agreements, mean that the country has options when it comes to logistics. However, Mexico has not invested sufficiently in its logistics infrastructure to fully take advantage of its strategic position.

From a petrochemical perspective, more storage is needed, especially for a country that depends on imports. “There is currently no petrochemical terminal on the Pacific side of the country. This is where we really need to expand our infrastructure. Additionally, Mexico has to expand its storage capacity for hydrocarbons in order to increase the country’s competitiveness and safety inventory levels,” said Jorge Flores, commercial and business development manager at Vopak Mexico.

Flores spoke of the necessity to unload vessels more efficiently, a factor he says Vopak looks into closely when building new projects: “A major cost for our customers is demurrage — every day that a ves-



**Martin Sack, Regional Head – Americas, Leschaco**



**Gerardo Berea Montes, Special Gases Director, Grupo Infra**

sel awaits arrival to the jetty costs around US\$20,000-US\$25,000.”

He cited the amount of time that trucks sometimes wait in terminals as an additional bottleneck, and revealed that Vopak is working on a slot booking system that will streamline arrivals by allowing customers to set up an appointment for a particular date.

Alvaro Perez, managing director of Vopak Mexico, underlined the importance of companies pinpointing inefficiencies and making changes to overcome bottlenecks in their own processes: “There can be hidden factors that either increase cost or decrease efficiency, and the big solution lies in harnessing the power of data analytics and digitalization to streamline these processes.”

Innovation is not only related to the digital world, and logistics providers have had to adapt to the equipment at their disposal during a period of scarce availability. Santiago Carús, managing director of Euromex Logistics, related that the company used to always work with type A flexitank containers, but today, shipping companies often send non-specialized containers because that is all they have. “In reaction to this, we chose to innovate and reinforce the walls of the containers with steel bars. This increased costs a little, but importantly, made the containers for flexitanks safer and eligible for export,” said Carús, adding: “There is no worse cost than to stop exporting, so creativity is necessary to adapt.”

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The global flexitank market is expected to grow at a compound annual growth rate of 20.8% until 2027, according to a study published by Report Ocean on November 23rd, 2021. Carús explained that due to higher ocean freight costs, companies are looking to save on costs elsewhere, and flexitanks are the most economical system available for loading non-hazardous bulk liquids.

## HUMAN ASPECTS IN A DIGITAL WORLD

The global migration to remote work and transition to digital systems will allow for more streamlined and safe logistics. That being said, the transportation of goods will always be a physical act that requires machinery, infrastructure and people. “Digitization has been receiving more attention due to the pandemic and many companies are investing heavily in this area. However, we cannot move cargo only through digital solutions and human capital will continue to play an extremely important role,” reflected Leschaco’s Martin Sack, who added that the complex logistics sector requires highly specialized people, and companies working with logistics providers are put-

ting more value on qualified and reliable assistance.

Héctor Cuevas, director general of Logística Trae, suggested that port operators’ lack of chemical industry knowledge causes a challenge. He gave the example of a cyanide project Logística Trae was involved in with more than 100 cyanide containers. “No operator wanted to handle them because they were scared and the port was saturated. The condition in which this product is transported is very safe to handle, but because of the port saturation and the operators’ ignorance, the cargo was rejected and had to be moved to another port.”

Alfredo Romero, director general of Mapa Logistics, a Mexican company based in Veracruz which specializes in primary liquid packaging, storage and chemical transfers, highlighted how the location of logistics firms and their access to storage are key factors. “Most chemical companies have limited cargo capacity at their plants, which can translate into delays for containers and ground transportation,” he said, adding that due to the lack of containers leaving Coatzacoalcos and the delay of the Coatzacoalcos-Salina Cruz modernization project, Veracruz is the best option for exports. ■

## SERVICES

### PRIVATE SECTOR GAS SUPPLY



A lack of domestically-sourced raw materials, including natural and industrial gases, has constrained growth in the Mexican chemical sector. However, it has created opportunities for gas providers in the private sector to supply industrial needs. “Mexico imports approximately 80% of its natural gas consumption requirements, with about 90% of these imports coming from the US,” stated Caio Zapata, CEO of ÉNESTAS.

In the US, natural gas prices in 2021 reached their highest level since 2008, and Zapata defined the factors behind sharp price increases as a combination of overdemand with a lack of new production and storage. To help companies to manage this, ÉNESTAS’ business includes building terminals for customers according to the amount of raw materials or fuel they need, then integrating solutions which minimize the space needed for storage where supply is scalable. He added that ÉNESTAS can also help customers that are close to



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a natural gas pipeline develop the infrastructure to connect to the grid. "Our business is to create competitive access to raw materials and fuels," concluded Zapata.

Gerardo Berea Montes, special gases director at Grupo Infra, also spoke of the opportunities that gas manufacturers have, elaborating on the areas he sees as having strong potential: "I predict that grey hydrogen will play an important role in the short-term with green hydrogen being a critical gas in the long run. Ammonia will be increasingly important too, as it serves as a carrier gas for hydrogen."

Cryoinfra, the arm of Grupo Infra that produces cryogenic gases, saw an increase in demand from the petrochemicals, steel, mining, aerospace, automotive, electronics and construction sectors in 2021, according to commercial director, Dieter Femfert. He mentioned that nitrogen, argon, and hydrogen were three of the gases that had been in particularly high demand.

Grupo Infra has invested in new facilities in 2021 to increase production capacity. Femfert detailed: "We established nitrogen generators in Guadalajara, Aguascalientes and Mexicali, and inaugurated an air separation plant in Juárez in March 2021, as well as starting operations at our new air separation plant in San Luis Potosí."

One of the largest global suppliers of industrial gases, Air Liquide, celebrated its 10th anniversary in Mexico in 2021. Raphael de Montfort, the company's managing director in Mexico, suggested that the only way for gas producers to sustainably increase their supply is by lowering their environmental impact through a mix of short- and long-term solutions. In the short-term, de Montfort highlighted optimizing delivery and increasing efficiencies, as well as promoting purchase agreements based on renewable energy. In the long-term, he revealed that Air Liquide is focused on finding solutions to replace the use of natural gas with hydrogen.

## **TECHNOLOGICAL ADVANCEMENTS**

The introduction of automated technologies has been fast-tracked during the pandemic. Yokogawa, the Japanese company that supplies automation solutions to the chemical and petrochemical industries, is looking to penetrate the Mexican market in the coming years, according to Gabriel Sánchez, the company's director general in Mexico. Sánchez commented that to achieve complete autonomy, the main challenge is to integrate different systems, and gave the example of a local chemical company in Mexico that Yokogawa is supplying with advanced process control solutions. "These solutions are implemented where plants are already automated, but on top of the automation, you implement multi-variable controls which allow for optimization of the process."

Another Asian company with a growing footprint in Mexico is Chinese producer of plastics injection machines, Haitian, which inaugurated the company's first manufacturing hub in the Americas in Guadalajara, Mexico, in 2021. José Antonio Barroso, deputy general manager of Haitian Mexico, explained that the idea behind the manufacturing hub is to have as much content as possible coming from Mexico to assemble and manufacture locally, however, as the project is still in its infancy, all machine components are still being imported from China in parts. Haitian Mexico is looking to obtain the 'Made in North America' certification once it has sufficient local components, and hopes to start exporting machines from Mexico to South America by the end of 2022, according to Barroso.

Fernanda Guarro, director general of 3M in Mexico, demonstrated how innovative products drive organic growth while helping to maintain margins, giving the example of 3M's Glass Bubbles product: "which are chemically-stable microspheres used to mix and make a product lighter... used to reduce weight in airships and cars, therefore improving the use of fuel and battery life."

In an era of rising inflation, the companies at the forefront of innovation will be the ones best positioned to navigate market turbulence in the years ahead. ■

