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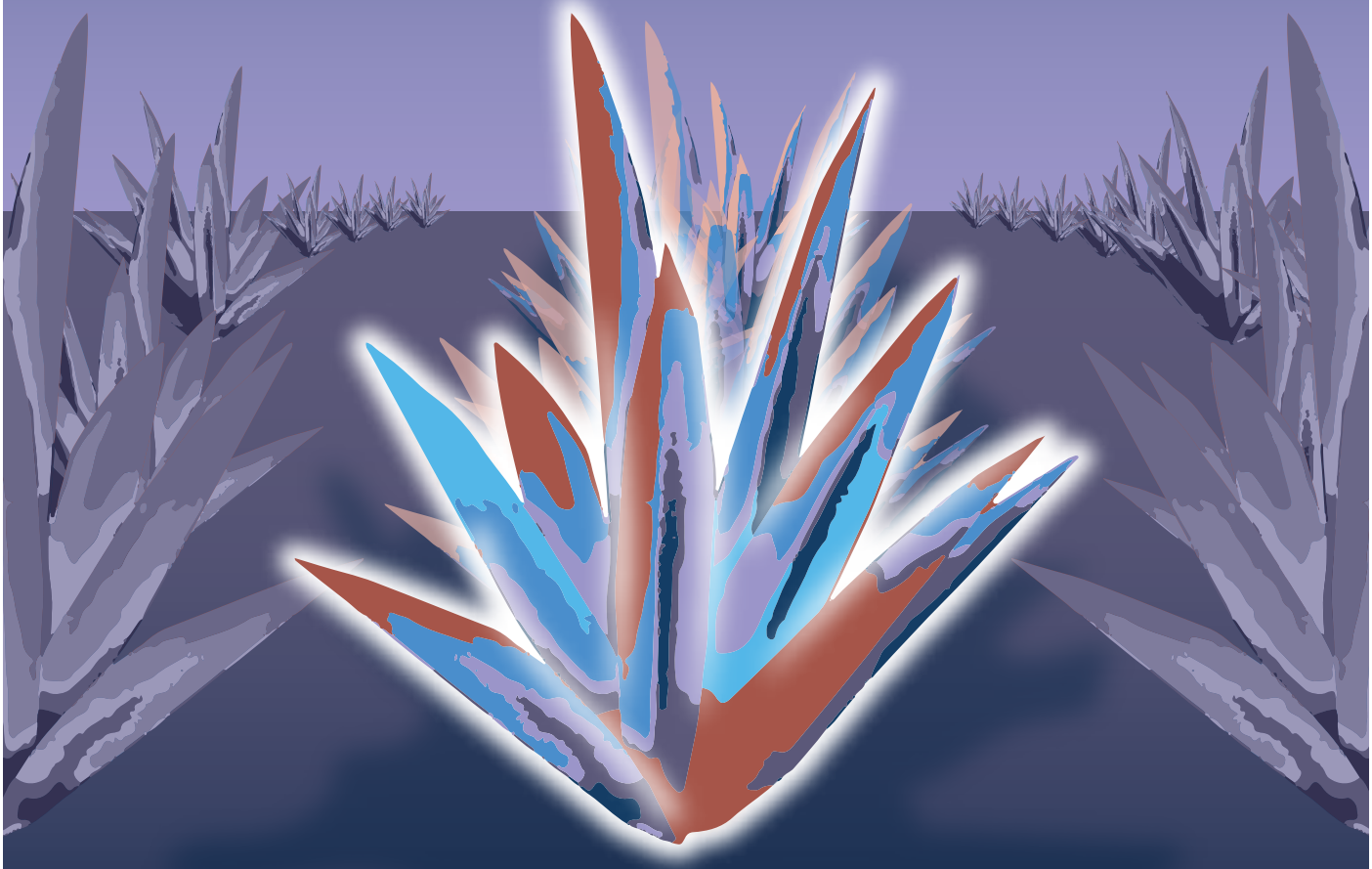
INDUSTRY EXPLORATIONS



MEXICO
CHEMICALS AND PETROCHEMICALS
2022

Economy - Chemicals - Petrochemicals - Agrochemicals
Specialty Chemicals - Paints and Coatings - Distribution & Logistics

Dear Reader,

Global Business Reports (GBR) is delighted to present the 2022 edition of its annual guide to Mexico's chemical and petrochemical industries. This report considers the main players that make up the full chemical value chain, including associations, producers, distributors, logistics providers and service companies. We also cover the different sub-segments of the chemical industry, including agrochemicals and specialty chemicals.

Supply chain and logistics bottlenecks characterized 2021 and highlighted the importance of strengthening local production. In Mexico the re-regionalization of supply chains offers a golden opportunity to take advantage of the country's inherent advantages – its geographical location, an abundance of young talent and competitive labor costs. However, a lack of raw materials supplied by Pemex has resulted in Mexico becoming a net importer of petrochemical products, limiting the competitiveness of its chemical sector.

In 2022, the government proposed a highly controversial constitutional reform that aims to give a greater share of electricity production to the CFE (Federal Electricity Commission). This threatens to not only push energy costs up, but also increase carbon emissions. On the other hand, the announcement that Pemex will work with Braskem Idesa to build a US$400 million ethane import terminal provides a blueprint for the type of public/private partnership that can help Mexico rejuvenate a sector that is becoming increasingly relevant in the energy transition.

Perhaps the biggest theme uniting the sector is the inevitable rise of sustainability-driven products and investments. In this sense, Mexico's private sector is swimming with the current as a global transformation in the chemical sector takes place led by consumer trends towards greener products.

The following pages are the culmination of over 75 interviews conducted with key decision makers, to provide a holistic view of the companies and themes shaping the industry today in 'Mexico Chemicals and Petrochemicals 2021'.

We thank all our interviewees that have taken the time to provide their valuable insights. To all our readers, we encourage your feedback and welcome interest in being interviewed for future reports.

Alfonso Tejerina
General Manager and Director,
Global Business Reports
(GBR)

MEXICO CHEMICALS AND PETROCHEMICALS 2022
Industry Explorations
Global Business Reports

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INTRODUCTION TO MEXICO

"Mexico has a competitive advantage in terms of logistics, labor costs are very competitive, and there is abundant young talent available. To take advantage of these opportunities, industry and local authorities should collaborate in finding a common and sustainable agenda to develop Mexico's manufacturing sectors."

- Martín Toscano,
President,
Evonik Industries Mexico

Image courtesy of Marco Antonio Reyes in Pixabay

Introduction to Mexico's Petrochemicals and Chemicals Sector

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 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."

> Even if new electricity 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.
>
> **– Federico Muciño García, Consulting Partner & Founder, EPSCON – Energy Procurement Specialists**

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

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.

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 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.

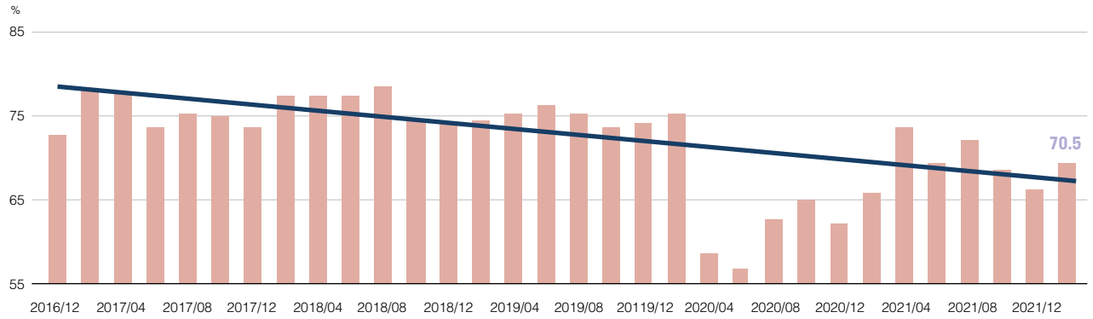
Federico Muciño García, consulting partner and founder of EPSCON, a Mexican company specialized in energy procurement, warned that the reform would not only affect companies operating in the energy sector, but energy procurement options available to consumers would also be affected. However, he expects 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." ■

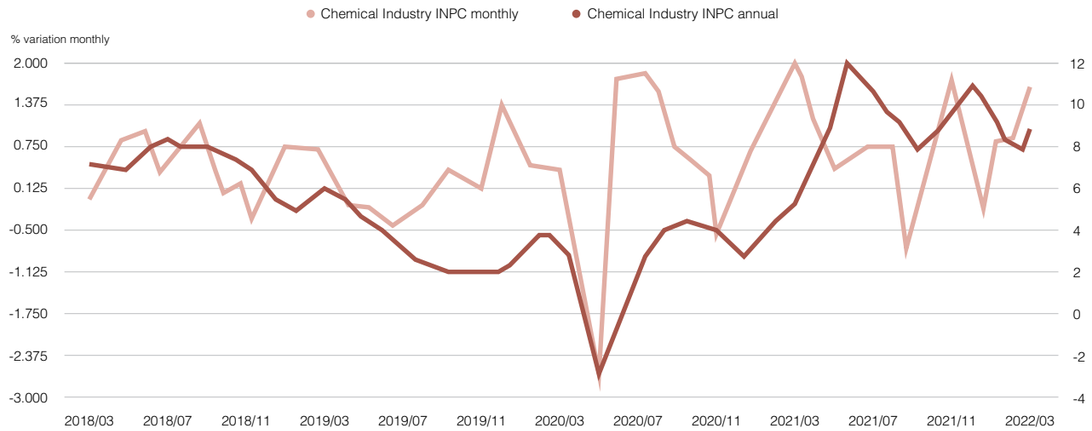
INSTALLED CHEMICAL INDUSTRY CAPACITY IN MEXICO (%)

Source: ANIQ



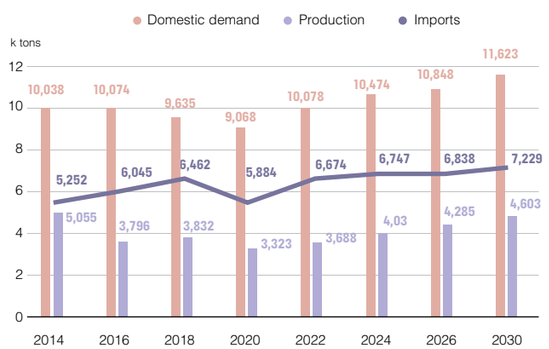
NATIONAL CONSUMER PRICE INDEX (INPC) OF THE CHEMICAL INDUSTRY

Source: ANIQ/INEGI



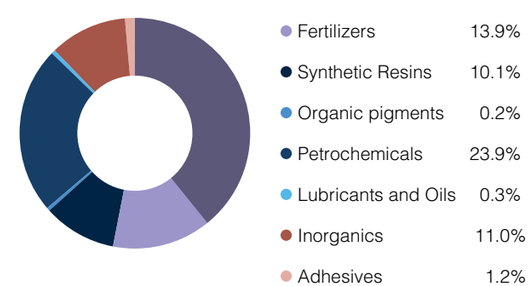
MEXICO SUPPLY & DEMAND OF BASIC CHEMICALS

Source: IHS (2021)



SHARE OF CHEMICAL INDUSTRY PRODUCTION (FEBRUARY 2022)

Source: ANIQ



Miguel Benedetto

Director General
NATIONAL CHEMICAL INDUSTRY ASSOCIATION (ANIQ)

> At the moment, the Mexican chemical industry is currently producing at 60% capacity, so ANIQ is working closely with the government and Pemex to increase production to be able to sufficiently supply market demands.

Which segments of Mexico's chemical sector were the best performers in 2021?
The sector that saw the most growth in 2021 was lubricants and we expect this growth path to continue in 2022. The industrial gas segment grew by 12.3% due to increased demands from various industries such as oil and gas.

What are the main themes impacting Mexico's chemical industry at the start of 2022?
There are two main themes impacting Mexico's chemical industry, the first being Covid. Markets that were affected by the pandemic in 2020 have not yet completely recovered, however, production has increased and we have reached levels similar to 2019. We were fortunate that the chemical industry was considered essential, but not all segments of the economy were deemed critical, resulting in great impacts on demand. Figures from October 2021 show a production decrease of 1.4%, but we expect this figure to rise in 2022.
The other major aspect impacting Mexico's chemical industry is the lack of raw materials supplied by Pemex. There is a shortage of ammonia, which is extremely important for our fertilizer sector, as well as all the derivatives of ethylene. At the moment, the Mexican chemical industry is currently producing at 60% capacity, so ANIQ is working closely with the government and Pemex to increase production to be able to sufficiently supply market demands.

How could public/private partnerships such as Braskem Idesa's announcement to build an ethane import terminal with Pemex improve the petrochemical landscape in Mexico, and what can companies do in the short term to mitigate the current lack of raw materials?
Mexico has a lack of ethane and consequently a lack of ethylene. This has impacted supply chains such as the oxide ethylene chain. The new Braskem Idesa and Pemex investment will significantly increase ethane and ethylene supply in Mexico. However, construction of the required infrastructure will only be finished in two years, and in the meantime, companies must look at the most cost-effective ways of importing feedstock where possible.
Mexico currently imports around 75% of its petrochemicals and for the time being we will continue on this path. Approximately half of these imports come from the US and we are developing infrastructure to be more competitive in importing these materials, such as increasing port infrastructure to import through sea freight. The chemical industry is also able to use gas provided by the new underwater pipeline that connects Houston with Tuxpan, Veracruz.

To what extent could the proposed electricity reform put forward by the Mexican government impact the country's chemical sector?
ANIQ conducted a survey with its members to establish the impact the electricity reform could have on the Mexican chemical sector. 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 only 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. Secondly, the CFE generates power from less competitive sources than the power currently being generated in the chemical industry. This change of source would represent another 1 billion Pesos impact.
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. The government wants to pass the bill by April 2022, but we hope to enter into dialogue with them to make the reform less aggressive.

Can you elaborate on how ANIQ is showcasing its sustainability initiatives?
ANIQ's 2021 sustainability report was launched in November 2021 and aims to highlight what the chemical industry has done over the past years to work towards a better future. We are also currently in the process of producing a special report focused on the circular economy. In November 2021 we opened a virtual museum which showcases the industry's sustainability efforts, specifically with regard to plastics. Through these platforms we want to change public perspectives and demonstrate the benefits of the chemical sector and contributions the industry is making towards a better world. ■

Adrian Duhalt

Post-doctorate fellow – Mexican energy studies
RICE UNIVERSITY'S BAKER INSTITUTE

How would you define Mexico's current petrochemicals landscape?
After decades, of overlooking the strategic character of this industry, Mexico, in a similar way to other Latin American countries, has turned into a consumer market rather than a producer market, meaning that a significant share of the country's consumption of petrochemicals (and products of petrochemical origin) is sourced abroad.
Between 2016 and 2020, Mexico's petrochemical imports averaged US$21.03 billion per year, a value that exceeded the US$19.84 billion of Pemex's average crude oil exports over the referred period.
Mexico's petrochemicals sector boasts several inherent advantages and hence there are important reasons for the government to pay attention to the industry. In addition to the sizeable domestic market, there is great potential in the regions of Mexico where the petrochemical industry thrived in the past and that still feature valuable capacities, including a pool of chemical firms and service providers, as well as a specialized labor force.
The focus of the current government revolves around energy sovereignty, and the means to achieve so is to increase crude production and upgrade the refining infrastructure. Mexico's bet is on activities where expected goals are yet to materialize.

What advice would you give to the Mexican government?
The government needs to conduct an assessment into the current status of the petrochemical industry. Also, 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. Hence, if the government of López Obrador seeks to craft a scheme to boost the industry, both these chains are obvious candidates where to launch initial actions. To that end, policy makers have at their disposal foundations to act upon, including existing production facilities, a skilled labor force in different regions, a large local market, and a strategic geographical location. ■

Adam Rothman

Managing Director & Partner, Head of Chemicals and Process Industries – North America
BOSTON CONSULTING GROUP

What can companies in Mexico do to mitigate the challenges brought on from a current lack of domestic feedstock?
There are two topics, the first being what to do now and the second being what to do in the future. Right now 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. In the future, if those feedstock challenges are sustained we might see the overall profile of the Mexican chemical industry change to be less strong in petrochemicals and more focused on specialties and other products that are less dependent on the availability of feedstock.

How is the topic of sustainability transforming the industry and products?
I view sustainability as having four major sub-components. First, there 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. Second, we see continued product innovations to improve the life-cycle carbon footprint of the next step in the value chain: the "handprint" of chemical products. An example would be additives that make a coating last longer or plastics that enable a lighter car. Innovation has always driven the industry but I think there is room to improve the technical and strategic marketing of these benefits.
Third, we see growth of products that are directly linked to energy transition. These products will evolve strongly as the economy decarbonizes and therefore will receive substantial new investment. Examples include materials used in electric vehicles or hydrogen storage.
Finally, we see an increasing focus on the circular economy. A circular economy mean 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. ■

> In Latin America we have been doing a lot of work on education about plastics, their proper use, design, handling and recycling.

Verónica Pérez

President – North Region of Latin America
THE DOW CHEMICAL COMPANY

Can you provide an overview of Dow Chemical's production capabilities in Mexico?
In Mexico Dow has production in Querétaro, Tlaxcala and Toluca. In Tlaxcala we have a polyurethane plant that is important for products that are used in car interiors. The plant in Querétaro mainly produces additives for formulations in the coatings industry. The Toluca plant produces adhesives for flexible packaging, which have been in very high demand in the last two years, particularly for the food.

What are your views on the current business climate for chemical companies in Mexico, including how the proposed energy reform could affect producers and impact investment?
I think we are at a very critical moment in Mexico because we are seeing that some laws are changing drastically without giving continuity to established legislation, such as energy. Dow is working with different associations to assess how this could impact costs and investments. Mexico has many advantages from an investment standpoint, such as the country's geographical position and talent base. However, the country must work to remain competitive from a cost perspective.
The proposal to give more of the electricity supply to the CFE would not only require an investment of billions of dollars, it would represent a shift to expensive energies with a negative environmental impact. Finally, there is the statement from the US with a list of items from the T-MEC (USMCA agreement) that have not been implemented. This is an issue on which it is up to all of us to be vocal and active as it is one of the most critical points for Mexico's agenda in the coming years.

Where is Dow currently focusing its R&D from a sustainability standpoint?
Dow has always been a pioneer in chemistry and sustainability is a big part of the company's evolution. Changing some of the technologies we have is very important; heavy industry cannot continue to compromise the planet and its resources. With this in mind, in October 2021 Dow announced plans to build the world's first net-zero carbon emissions ethylene and derivatives complex in Alberta, Canada.
In Latin America we have been doing a lot of work on education about plastics, their proper use, design, handling and recycling. In addition to new infrastructure that is needed to facilitate recycling, we require the hands and knowledge of the citizen. This is a global effort but it requires regional focus. For example, 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.

You spoke at ANIQ's Foro Nacional in 2021 about the New Normal in the Chemical Industry – People as the Epicenter of Change. Can you elaborate on Dow's approach to attract and retain talent?
The chemical industry has suffered from low talent attraction for many years. The sector is competing for STEM students who, instead of choosing chemistry-oriented careers, go to the tech industry. In 2022 there has been a lot of talk about The Great Resignation worldwide. Combined with the Omicron variant, it presents a serious challenge to employers. A lot of people are losing their purpose because they don´t feel to have a work/life balance. Today more than ever we need that balance and mental care in the face of what we have been experiencing throughout the pandemic.
I am proud that Dow has always worked on policies that understand the need for flexibility, even before the pandemic. Flexibility includes personal or family care, or even other interests. For instance, Dow has announced equality in paternity and maternity leave, including for adoption and LGBT+ couples. Another initiative Dow Mexico has implemented is for employees to take time off work to volunteer in activities they like.
Another strategy is to re-think stereotypes, such as the need for an engineer to speak English or have a PhD. In some cases we will find the talent, but in others we have to develop it and invest in it. Finally, Dow is integrating women in production areas where they were not before. We believe that increasing diversity and inclusion in the workforce is how the Mexican chemical industry can move forward and improve. ■

Arturo Molina

Managing Director – Mexico
COVESTRO

Can you elaborate on Covestro's focus on alternative raw materials, and how the company plans to use biomass, CO2, and recycled products?
Covestro aims to be a fully circular company and therefore we consider the raw materials and energy we use for processing and producing our products. We do not see biomass, CO_2 and recycled used materials as waste, but rather the raw materials of the future.
For example, aniline is an important basic material for the chemical industry traditionally derived from benzene. Covestro has been able to produce aniline using raw paper and industrial sugar as a biomass. In this process, 100% of the carbon in the aniline comes from renewable raw materials. We are using residuals from other industries to create our own raw materials. Another example is our plant in Germany, which is taking CO_2 from the air and utilizing it in polyurethane products. This process conserves fossil fuels, such as crude oil, and reduces the amount of atmospheric carbon dioxide because the carbon from CO_2 is essentially being recycled. Covestro has also created a new technology in Spain where we use a catalytic process that needs 30% less energy to produce chlorine.

What types of new recycling technologies or practices do you think can help increase the rate at which plastics are recycled?
We must start to recognize that products have a second life so that after initial use we must regard them as a valuable resource. Waste should be recycled not dumped in landfills or otherwise disposed of in nature. 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. As an industrial plastics manufacturer Covestro is increasingly researching and promoting innovative recycling methods and approaches, such as chemical recycling. ■

José Magalhães Fernandes

Vice-President, General Manager for Latin America Region
HONEYWELL PERFORMANCE MATERIALS & TECHNOLOGIES

What progress has Honeywell made with sustainability-focused initiatives?
Renewable fuel is one of our focus areas and we have proven technologies where we can convert vegetable oil, animal fat, or cooking oil into green diesel. Produced with our UOP Ecofining process, Honeywell Green Diesel emits up to 85% less GHG 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 terms of plastic circularity, we have developed the Honeywell upcycle process with the potential to increase the amount of global plastic waste that can be recycled to 90%. The process utilizes industry-leading molecular conversion, pyrolysis, and contaminants management technology to convert waste plastic back to recycled polymer feedstock.
Honeywell has also developed a battery storage system to store energy generated through renewable resources. We offer a platform to help customers forecast and optimize their energy usage and costs. The solution integrates our asset monitoring, distributed energy resource management, supervisory control, and analytics functionalities to increase resiliency, reduce supply costs and support corporate sustainability goals.

Can you expand on how Forge Worker Assist SaaS is helping petrochemical companies improve decision making?
Honeywell's Forge Worker Assist software offers a deskless, hands-free solution for operators who before, during inspection rounds, had to collect data from different places on site, go back to the office and process the data. Our solution is a software-based component that connects all information in real time online and the operator can collect the data on a mobile device, process it more efficiently and act faster where necessary. This solution accelerates the resolution of issues, increases efficiency with tasks such as inspections and quality audits, and aims to empower employees to further develop job competencies. The cloud-based software allows for video and audio peer-to-peer and multiparty communication enhanced with media, file sharing, screen sharing, remote camera control and text messaging. ■

SUSTAINABILITY

"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."

- Arturo Molina,
Managing Director – Mexico,
Covestro

Image courtesy of Bayer Crop Science

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 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 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_2, 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."

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.". ■

Our strategy has been to venture into biological products.

Gregory Polak

Director General
POLAQUIMIA

Polaquimia has been supplying chemicals to the Mexican market for over 100 years now. How has the company's vision evolved in recent years?

Five years ago Polaquimia 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. For example, we have added a new division in agriculture for adjuvants, which allows for 20% to 30% more efficacy. Our strategy has been to venture into biological products.

Polaquimia is growing with a rate of 10% to 15% per year from a volume perspective, stimulated by our new product lines, which we think will gain further traction as the market becomes less apprehensive of trying new products. We have also retooled the company's product lines to have a much bigger emphasis on profitability.

Can you elaborate on how Polaquimia is developing its product lines?

We started producing products without ethylene oxide and propylene oxide feedstock, but importantly maintaining the same applications as products made using these feedstocks. Our biodegradable products are also specialties that abide to the circular laws of the environment. For instance, Polaquimia has saved over 400,000 hectares of walnut production by using bio-based products, and we have introduced biologicals that will increase chili crops by 40% in Jalisco. These efforts are aligned with where the market is moving, as consumers want products that do not harm the environment. Companies need to focus on sustainability-related products now, because they will only become more relevant in the future.

What are adjuvants and how can they help the sustainability of food production?

Adjuvants are a combination of surfactants, which are used as additives to boost the performance of chemicals. It is important to note that no organic product can properly substitute herbicides, so adjuvants are necessary. 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. Culturally speaking, the producers of active ingredients have been against adjuvants, because using adjuvants mean less active ingredients. They often give a cock-and-bull story to farmers that adjuvants cost more, but over time, farmers have come to see the value of adjuvants from both a cost and an environmental standpoint.

To what extent has Mexico's agribusiness developed in the last decade?

Mexico's food production sector is growing at a tremendous pace. We have seen an evolution in both technologies that greatly improve production yields, and also types of crops as higher margins can be achieved with berries and avocados in comparison to bulk crops such as wheat. Speaking specifically about avocados, 'the green cash crop', Mexico accounts for around 38% of global production, almost three times the amount of the second producer (Colombia). From a technology standpoint, Mexico is not quite as advanced as Spain and California; however, we are making a lot of progress in this regard.

How do you view the current business climate in Mexico with regard to government policy?

In general, proposed government reforms have had a negative impact on sentiment. With regard to energy reform, the major issue is that the State lacks money and is trying to control energy production to raise capital, but this will make the country less competitive and will not help attract private investment. However, if the government changes stance, I believe we will see much progress and resources pour into this country. A government that guarantees a future with measured risk can attract a tremendous amount of capital into a country that has many inherent advantages.

Which export markets offer the best opportunities for Polaquimia?

Traditionally Polaquimia was focused on Latin America but we have turned our focus to the US market, which saw significant growth in 2021. Due to logistics challenges from Asia and Europe, Mexico has become more attractive to the US. Comparing China to Mexico, Mexico guarantees and honors patents your investments 100%, and has the advantage of geographical proximity. If you are in farming in Mexico you can harvest asparagus in Aguascalientes and in three days it is in the supermarket in California ready for consumption. ■

> There is room to grow not only with crops we already have solutions for, but also with new crops in need of our technology.

Sergio Aburto

Latin America North Director
ACADIAN PLANT HEALTH

What is Acadian Plant Health's core business and what is the typical profile of your client base?
The core business of Acadian is the commercialization of plant biostimulation products coming from a seaweed called Ascophyllum nodosum. Our crop care products optimize plant growth from root development to post-harvest by improving plant establishment, abiotic stress resistance, and improved nutrition in plants.
We supply our products mainly to exporters of high value crops, so we focus on technologies for fruits and vegetables that are primarily cultivated for export. Fortunately for us, there has been a great response. Acadian is the leader of the seaweed market with 37% market share, an improvement from last year.

Acadian's products are all based on brown Ascophyllum nodosum seaweed. Can you explain how the properties and treatment of this seaweed can help improve crop strength and quality?
There are different types of seaweed on the market, but Ascophyllum nodosum has the largest program for sustainability as well as great scientific support. It has been widely tested in trials at global universities that have demonstrated its ability to work with the genomics of a plant by turning on or off certain genes. For example, it can enable the plant to perform under extreme temperatures, take better advantage of a soil's salinity and improve its ability to absorb water.

Can you explain to us the difference between Acadian's Stimplex and Acadian product lines?
Stimplex improves a plant's ability to handle abiotic stress, improving nutrients uptake allowing better plant performance to express maximum potential production via foliar. Acadian, on the other hand, improves the ability of a plant's root system to uptake fertilizers, nutrients and water. Essentially, Acadian is used for the root area of the plant, everything related to drip irrigation and irrigation containing nutrients, whereas Stimplex is used in the foliage area.

Which types of crops have attracted the highest demand for Acadian's products in 2021?
We have seen increased demand for both Stimplex and Acadian because growers are increasingly seeing the need to improve their plants' abilities to handle stress, especially with high-margin crops like berries, avocados and grapes. Growers are also 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. This more efficient use of fertilizer is especially important for crops like melons, cucumbers, pecans, avocados, apples and cherries.

What have been the main dynamics impacting Mexico agribusiness export markets in 2021?
The Mexican government's new regulations have created many problems for companies and have contributed to the increase in import costs. The country's new tax code has brought about issues for all industries, including agrochemicals.
On the other hand, we have seen a good year for exports because Mexico's main market, the US, has increased its demand. Additionally, there was a global price increase in crops like soybeans and corn due to a lack of production from countries like China. In all, every single crop we export increased.

How is Acadian able to increase production of seaweed-based biostimulants while at the same time increasing the amount of seaweed available?
We have a team of scientists who perform evaluations to make sure the seaweed is in its optimal natural environment as well as track the best time to harvest it. Regardless of heightened demand, we only harvest one third of the seaweed bed each year so that it can grow back in a year or two. Acadian Plant Health has implemented this practice in Canada, Scotland, Ireland and Norway and has gained international recognition.

What would you Acadian Plant Health to achieve in Mexico by the end of 2022?
Acadian's main objective for 2022 is to improve the company's penetration in new markets. There is room to grow not only with crops we already have solutions for, but also with new crops in need of our technology. For example, only 3% of mango flowers develop into fruit. If we could increase that by just 1%, it would be tremendous for growers. We are also working on shortening the harvest cycle of agave and providing consistency in pecan production. ■

Samantha Salamanca

Institutional Division Manager – Mexico
ECOLAB

To what extent is water scarcity a problem in Mexico, and which of Ecolab's technologies minimize water consumption?
Water care is one of the main priorities for Ecolab and in Mexico it is a subject that needs to be attended to with urgency. In 2021, according to UNAM (National Autonomous University of Mexico), Mexico had the second worst drought in its history, which meant that 70% of the country was impacted by water scarcity. Climate change is also putting pressure on water resources. Therefore, at Ecolab we are working to help solve these issues, and I can tell you about three technologies that we have available to significantly reduce water consumption.
One of them is 3D TRASAR, in which we use a wide spectrum of solutions to identify the risks that come with water use. It is a water management program that controls corrosion, scale formation and microbial contamination, letting you know in advance so you can take preventive actions. It is monitored continuously seven days a week by specialists here in Mexico, but also globally by Ecolab's Global Intelligence Center. This technology impacts positively water usage up to 40%, which means it not only saves this vital resource, but also adds to the operational efficiency.
Another technology we have is the Smart Water Navigator, a free tool for companies to go online and run a simulation so they can understand the value of water in their operations. They can take initial measures and outline their water management corporate objectives.
The third technology is Ecolab3D, an analytical platform based on the Internet of Things and Artificial Intelligence. The platform translates the data from different operational sources, like power generation plants, food and beverages manufacturing centers, factories and hospitals. Ecolab3D allows clients to save up to 30% in most operation systems, which represents savings of up to US$100,000 per year. ■

Salvador Urbina

Energy and Engineering Vice President – North Latam Region
LINDE

In which areas of clean energy is Linde currently investing?
Linde's goals are to reduce its greenhouse gas (GHG) intensity to Absolute emissions by 35% in 2035, as part of the National Determined Contribution (NDC) to the Paris Agreement. Specifically in Mexico, a lot of the country's energy currently comes from fossil fuels, but there is now interest and a lot of investment being directed to renewables. Linde is involved in many green energy projects, such as clean hydrogen for industry or mobility, that aim to lower carbon emissions by utilizing renewable feedstocks with the objective to reach net-zero emissions or Climate Neutrality by 2050.
Clean hydrogen is currently an extremely hot commodity and Linde has invested significantly to supply this product to the market. Hydrogen is a key enabler of the transition to low carbon energy and we have our own proprietary technologies and the expertise to help unlock its massive potential. We are able to offer a carbon-free alternative to conventional fuels that gives customers a turnkey solution. From design to construction and operation, including cutting-edge technologies to produce, store and dispense hydrogen, we are one of the world's largest manufacturers of hydrogen production plants and a leading provider of equipment for hydrogen refueling stations.

How significant is the company's experience in hydrogen projects?
Linde is the biggest supplier of hydrogen in Mexico and worldwide the company has already built over 200 fueling stations. We pride ourselves in being a one-stop shop for hydrogen fueling solutions with our offering focused on low total cost of ownership (TOC) per kilogram of hydrogen fuel. Linde also offers hydrogen energy storage solutions to balance supply and demand in intermittent renewable energy systems. Hydrogen holds the key to decarbonization for heavy industries. Our extensive experience, technologies and solutions make the transition to clean energy simple and attainable for all customers. ■

PETROCHEMICALS

"The flow of products and raw materials around the world will continue, but companies should pay more attention to ensure a reliable supply that allows them to continue production without being overly reliant on one source."

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

Image courtesy of Braskem Idesa

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 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 ethyl-

Stefan Lepecki

CEO
BRASKEM IDESA

The new deal signed with Pemex in September and sale of sustainability-linked bonds were important milestones that set the company up for the years ahead.

How would you evaluate Braskem Idesa's performance in 2021?
2021 was a fantastic year for Braskem Idesa. We continued to operate the Etileno XXI complex, even in a Covid scenario, thanks to excellent collaboration between team members, communities, clients and providers. On the production side, we have expanded our capacity to import ethane through our fast-track facility. Safety and environmental aspects in our plants have been a big focus, and we reinforced the company's circular economy commitment by tripling the sales of our PCR (Post-Consumed Resin) project. Finally, the new deal signed with Pemex in September and sale of sustainability-linked bonds were important milestones that set the company up for the years ahead.

On September 28th, 2021, Braskem Idesa announced an agreement with Pemex for ethane supply and the development of an import terminal. What led to this deal and what will it mean for the company?
In December 2020, there was a complete shutdown of our complex due to a lack of natural gas supply. In January 2021, we were able to restart the plants using ethane instead of natural gas, and it was at this time that we reopened the dialogue with Pemex. In September, an amendment of the ethane supply contract between Braskem Idesa and Pemex was signed to guarantee supply until 2025.
Furthermore, the deal secured the commitment of Pemex and other government entities to support Braskem Idesa in the implementation of an ethane import terminal. A combination of our fast-track program, Pemex's commitment to supply volumes of ethane, and the import terminal project shows a clear vision that by 2024 Braskem Idesa will achieve greater flexibility in feedstock supply. A critical issue for the continuity of our business has been solved, and our relationship with Pemex has evolved.

What is the development timeline of the ethane import terminal and how will it improve capacity?
The terminal is a US$400 million investment that will start up in the second half of 2024. It will allow us to import 100% of our needs to operate the Etileno XXI complex at full capacity. Moreover, it will allow for a future expansion of the complex. We are already in the process of ramping up production based on Pemex supply and fast-track imports, which will be expanded in H2 2022.
We designed the Etileno XXI complex for potential expansion with low investments. The idea is to expand cracker production and we will add an extra furnace. With some minor adjustments in other equipment and in the polyethylene plants, we believe we can expand capacity by 20% once we have the new ethane import terminal operating.

Last year Braskem Idesa sold US$1.2 billion worth of 10-year sustainability-linked bonds (SLB). What are SLBs and what greenhouse gas reduction targets do they set?
Braskem Idesa was recently awarded the GlobalCapital deal of the year in Latin America for the size, complexity and importance of the sale of 10-year sustainability-linked bonds (SLB) in 2021. The Etileno XXI complex was implemented through a project finance scheme, which was very relevant during the construction phase. After the start-up of the operation, we gradually moved from a project finance scheme to corporate debt. We issued a US$900 million bond in 2019, and last year we issued the SLB for US$1.2 billion, which is important for the company to be able to maintain its capital structure.
The SLB means we have commitments in terms of environmental performance, including reducing our greenhouse gas emissions by 15% from a baseline of 2017 until 2028. We already have a lot of initiatives in place in order to increase the efficiency of internal processes and capture the CO_2 we produce. This aligns with Braskem and Braskem Idesa's global commitments to achieve greenhouse emission neutrality by 2050. The reaction of the market was extremely positive: we received offers worth over US$4 billion for the SLBs, which is a clear demonstration in the trust of our company and the belief that Mexico can deliver. ■

Fortunately for Grupo Idesa in all of its business units, including distribution and logistics, 2021 was an excellent year.

Patricio Gutiérrez

Chairman of the Board & CEO
GRUPO IDESA

How was 2021 for Grupo Idesa's petrochemicals businesses?
Fortunately for Grupo Idesa in all of its business units, including distribution and logistics, 2021 was an excellent year. Our petrochemical business unit in particular had an extraordinary year compared to 2020 and 2019. There was a rebound in demand from industries such as construction in the US and other industries, and high oil prices led to price increases, which helped improve margins for certain products and segments.

What can petrochemical producers in Mexico can do to mitigate the current lack of feedstock from Pemex in the short and medium term?
The feedstock supply in Mexico from Pemex has suffered for many years. In the short term, the industry needs to continue exploring new logistics routes and mechanisms in order to have a more reliable supply chain in North America. The winter storm in Texas in early 2021 made companies rethink their supply chains, moving towards a more regional version of globalization. The flow of products and raw materials around the world will continue, but companies should pay more attention to ensure a reliable supply that allows them to continue production without being overly reliant on one source. Low cost is not always the best option.
In the medium to long term, the petrochemical industry participants need to find a way to work together with the government to be able to improve Pemex's operations at their different gas processing units and their petrochemical sites. Pemex has good assets, there is a lot of room to make upgrades and also improvements with maintenance programs which will increase operational reliability. We have made several proposals, 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. We want to work together in order for Mexico to have a better situation.

Which areas of Mexico's chemical industry supply chain do you think would be the most worthwhile targets for investment?
One area which is worth exploring for public, private or a mix of both investments is storage. When there is a lack of local supply product needs to come from someplace else. In the case of Mexico, this is primarily from the US via railways, trucks and vessels. Most of these require storage. For instance, vessels 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.

Which of Grupo Idesa's four petrochemicals companies – Petramin, Síntesis Orgánicas, Novidesa and Idesa – do you see as having strong potential for growth in 2022?
In two of our companies – Síntesis Orgánicas, phthalic anhydride, and Petramin, alkylamines – we see strong demand in 2022, but do not have much room to grow, as we are over 96% capacity and utilization rate is very high. Novidesa EPS (Expanded Polystyrene Foam) is one of the companies we see strong potential for growth in 2022 in many sectors, including Mexican and US construction and packaging. For Idesa's ethanolamines business we see strong demand, but it depends on Pemex for the supply of ethylene oxide. If we receive 100% of the volume in our contract or more we will be able to increase production and sales, locally and exports.

What is your vision for the evolution of Grupo Idesa from a sustainability standpoint?
Grupo Idesa has always been committed to the environment – Idesa was one of the founders of the Responsible Care program in Mexio. Now we have a broader spectrum regarding sustainability, which goes beyond the regulations and laws in Mexico. In 2021, Grupo Idesa produced its first ESG report, which will be launched in February 2022 and will be our baseline for future objectives. Looking ahead, the two main pillars of Grupo Idesa's evolution will be sustainability and digital transformation. Even though petrochemical companies are often at the avant-garde of operational technology, I believe there is a lot of room for improvement and investments in digitalization throughout the chemical supply chain to become more efficient. Greater efficiency will allow companies to cut emissions and meet sustainability targets in the future. ■

ene) 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.

Sustainability-focused 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 ecofriendly 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 H25 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, potassium 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. ■

> Unigel is currently investing in increasing the capacity of its RMMA unit so that we can produce more acrylic sheets using recycled material.

Klip Moshinsky

Director General
UNIGEL MEXICO

2020 was a record year for Unigel and its Mexican subsidiary, Plastiglas, driven by the global demand for acrylic sheets. How has business been in 2021?

Business in 2021 has been healthy, but we have seen a decrease in demand from 2020. The markets in the US, Canada and Mexico bought huge inventories in 2020, and the demand started to level out again as the Covid crisis became more under control. Although inventories remain high, the markets Unigel Mexico serves are still healthy.

Unigel has experienced challenges obtaining some pigments over the past year, but fortunately we 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.

Unigel's new plant in Mexico for the production of extruded sheets opened in December 2020. What have been the developments at this facility since opening?

Today, Unigel is producing extruded sheets in Mexico, but at a lower capacity than expected as customer inventories for this product are still high due to their intake in 2020. However, we are currently in the process of developing specialty grade extruded acrylic sheets such as impact grade, framing grade, and collars, because our current lower production levels has given the company the time to produce small amounts of specialty products and start testing the demand in the market for these products.

Can you elaborate on Unigel's R&D efforts to produce specialty grade and solid surface products?

Unigel currently has several R&D projects ongoing. One project called Clean Green Cast is already in production where we are using 100% recycled PMMA. Sustainability and using recycled materials is a worldwide trend and fortunately acrylic is an easily recyclable material. We are recovering acrylic scraps from our customers and our own operations and converting them back into PMMA resin to be reused for the production of sheets.

What are your thoughts on the proposed energy and electricity reforms in Mexico?

The proposed governmental reforms are extremely unfortunate, especially from an investment point of view. Considering the current prices of importing from Asia due to logistics bottlenecks, now should be the time to invest in Mexico, but the uncertainty surrounding the reforms has the consequence that people are thinking twice about making investments into the country. Furthermore, 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 towards greener and cleaner energies. Plastiglas has developed environmental energy projects, but we are now thinking twice about implementing these as there is too much uncertainty in the near term.

The magazine Expansión listed Plastiglas as one of the Top Super Companies of 2021 for its innovative focus on human resources. Can you explain your policy for attracting and retaining talent?

I believe that Plastiglas is a friendly working place, and we have employees that have been working for the group for 20, 30, and even 40 years. We incentivize our people, recognize their work, and create a favorable working environment, resulting in our employees' happiness in the workplace. In a time where many companies where downscaling due to economic pressures caused by the pandemic, Plastiglas was growing and had to hire more people. I believe that the company is recognized as a safe place to work where everyone is accepted, well looked after, and where they can grow.

How would you define Unigel's objectives in Mexico for the coming years?

Producing more recycled products is key in the quest to lower carbon emissions. Unigel is currently investing in increasing the capacity of its RMMA unit so that we can produce more acrylic sheets using recycled material. In the future, we want to be producing RMMA at such a level that the challenge is actually importing more scrap from other countries.

In terms of our objectives for 2022, we would like to see our extruded sheet line producing at full capacity. We also hope that Unigel's R&D projects will have materialized by the end of the year so that we will be producing impact grade and framing grade extruded sheets to increase the value of our product mix. ■

> Mexico has been pioneering for IVL in recycling. The PET bottles that are turned into flakes at our facility in Guadalajara are used in our Querétaro plant to be turned into pellets.

Muthukumar Paramasivam

Business Head, Aromatics & PET – Americas
INDORAMA VENTURES LTD

Can you introduce Indorama Ventures Ltd (IVL) and describe the company's footprint in Mexico?

IVL has three business segments – Combined PET, Fibers, and Integrated Oxides and Derivatives (IOD). Currently we have 124 operating sites in 33 countries, with more than 24,000 employees. IVL is in the process of completing the acquisition of Oxiteno, which was announced in Q3 2021. Once completed, this will add 11 more sites and one more country (Uruguay) to our portfolio.

IVL has the leading position in the product categories in which it operates. To put this into perspective, we are the world's largest PET resin producer with an estimated market share of 22%, thus 1 in 5 PET bottles world-wide are made from our resins. 1 in 2 premium baby diapers are made from our fibers, 1 in 4 airbags are made from our yarns and 1 in 4 cleaning products in the Americas are made from our IOD products.

The company currently has three manufacturing locations in Mexico, including a large complex in Querétaro where we produce PET polymers, tire cord fabrics and industrial textiles, and technical cords and fabrics for the automobile industry. In Jalisco, we have a plant for recycling post-consumer PET bottles into flakes. And, in Puebla, we have a plant producing technical textiles such as woven and cut air bag fabrics. Oxiteno has three manufacturing facilities in Mexico in Querétaro, Jalisco, and Veracruz, which will further enhance IVL's footprint in the country once the acquisition is complete.

How will the acquisition of Oxiteno add value to IVL's portfolio in the Americas?

The acquisition of Oxiteno will give IVL a unique portfolio of high-value surfactants, and significantly extend our existing IOD business. The surfactant market has seen consistent growth over the last decade, driven by population growth and increasing hygiene awareness. Along with the 11 manufacturing locations spread across the Americas, Oxiteno has a very experienced management team and five R&D centers, which will add to IVL's innovation credentials in green chemistry. We believe the extended footprint has the potential to drive expansion in Europe and Asia by leveraging our existing surfactant business in Australia and India and IVL's global presence.

Can you elaborate on IVL's approach and philosophy surrounding sustainability?

Sustainability is not just a concept for IVL – we have embedded this at the core of everything we do. This was emphasized even further recently when we included this element in our Vision statement: 'To be a world-class sustainable chemical company making great products for society'. Covering the dimensions of ESG, our philosophy is built on the principles of people, planet and purpose.

Regarding recycling, the full recyclability of PET polymers creates an opportunity to enlarge our investments in this area, and IVL has been building the infrastructure the world needs to close the loop and deliver a circular economy for PET. We have pledged to increase recycled volumes to at least 750,000 t/y by 2025 with a total investment of US$1.5 billion. Since 2011, IVL has recycled close to 70 billion PET bottles, a figure which will increase to 50 billion bottles recycled per year by 2025. Mexico has been pioneering for IVL in recycling. The PET bottles that are turned into flakes at our facility in Guadalajara are used in our Querétaro plant to be turned into pellets.

What would you say are the main opportunities and challenges in Mexico's chemical industry?

We believe Mexico plays a very important role in the Americas due to its large domestic market and its strategic location as a gateway to Central and South America. Mexico has a strong and growing consumer base as well as a skilled labor pool, which are great factors for investment. Furthermore, the country has a lot of natural resources suitable for the chemical industry.

Regarding challenges, there has probably not been sufficient investment to take full advantage of Mexico's natural resource endowment. Continued interfacing and alignment between the State and private sector can help to further unlock the value of these important resources, thereby also reducing the trade deficit in the industry. With companies and supply chains moving towards deglobalization and reshoring, such initiatives can provide new investment opportunities for the industries in Mexico and reduce external dependency.

Energy transition is another important factor. The faster Mexico can start supporting and investing in renewable energy infrastructure the more leading the country and industry can be. ■

> Each market has its own tendencies, but one common theme is that each market is looking to transition to new generations of ecofriendly and sustainable products.

Felipe Varela

Director General
GRUPO DYNASOL

Can you provide a brief history of Grupo Dynasol, including how the company was formed between Repsol and KUO Group?

Repsol and KUO Group are the shareholders of Grupo Dynasol. The partnership was formed in 1999 and back then the joint venture included only two plants, one in Santander, Spain and one in Altamira, Mexico. These plants were dedicated to the manufacturing of solution styrene butadiene rubber (SBS & SEBS). In 2015 the partnership was strengthened by the addition of two business units, General Química in Álava, Spain and Industrias Negromex in Altamira, Mexico. General Química is dedicated to the production of accelerators and antioxidants for the rubber industry and Industrias Negromex produces emulsion styrene butadiene rubber (ESBR) and nitrile rubber (NBR).

Additionally, we have two JVs in China. One plant is in Nanjing and produces nitrile rubber (NBR) and another in Panjing Liaoning, which manufactures styrene butadiene-styrene (SBS) and solution-styrene butadiene rubber (SSBRs).

What is the significance of Mexico for Dynasol?

Mexico is important for us, but it is important to note that Dynasol Group is global company. Practically 40% of the production we have in Mexico stays in the country, and the rest is exported. We export to all the main markets, not only the US, which is very important for us, but also Europe, Latin America, and in smaller proportion to Asia.

Which trends have you noticed in the synthetic rubber and chemical rubber markets, and where has the most demand come from?

We make rubber for a great variety of segments: from chewing gum to pressure-sensitive adhesives, compounding and asphalt modification. The markets of asphalt modification for paving and roofing are very important for Dynasol. We also manufacture rubber for the tire industry, automotive, insulation for refrigeration systems, medical devices, and footwear. Each market has its own tendencies, but one common theme is that each market is looking to transition to new generations of ecofriendly and sustainable products. At the COP26 summit in Glasgow there was an agreement to give electric cars a predominant role for 2030. This is catalyzing transformation which is accelerating many of the projects and goals of the companies we supply to.

As for demand, the asphalt market is performing well because infrastructure projects that were delayed in 2020 due to the pandemic managed to start in 2021. Low interest rates in the US stimulated growth in the roofing market. Fast consuming goods (FCG) propelled demand for adhesives for packaging and labels since the pandemic started and Dynasol has an important participation in this segment. The tires sector for new vehicles was hit when the shortage of microchips affected the automotive industry, however this moderate decline was offset by strong demand from the replacement segment, as miles driven improved significantly in 2021. In general, the global economic recovery has resulted in robust demand across all segments that Dynasol Group serves.

Can you explain how Dynasol turns challenges into solutions through innovation?

Innovation is an essential element in our sustainability strategy. A good example is the products that we currently have for the asphalt segment. The asphalt industry is resource intensive. At Dynasol we are working to develop products more respectful of the environment and human health by reducing energy and materials requirements, increasing durability and safety as well as facilitating recyclability. Our high vinyl SBS is an example of a more sustainable solution. The high content of vinyl helps the tar crosslink process, which allows to remove sulphur and its H25 toxic emissions. It also reduces its energy requirements due to its lower viscosity and increases the durability of the asphalt mix and its compatibility with different quality tars.

Plastic waste is one of the biggest environmental concerns at the global level. The lack of biodegradability and its accumulation in nature have driven the use of recycled plastics. However, during the post-consumption reprocessing, plastics partially degrade losing properties. Therefore, it is necessary a better recovery so they can be applied in evermore demanding sectors.

With this issue in mind, we have developed the products Calprene 700 and Calprene H6180X that facilitate the up cycling of different types of plastic waste such as propylene, polystyrene, or polyethylene, improving their resistance to low temperatures and its processability and keeping `

Gustavo Pérez

Regional Director, Advanced Polymer Solutions – Latin America
LYONDELLBASELL

How significant is LyondellBasell's footprint and capacity in Mexico?

At LyondellBasell facilities three facilities in Mexico, in Altamira, Mexico City and San Luis Potosi, we develop solutions to enhance performance applications in food and industrial packaging, personal care, automotive and durable goods. Our focus is also on providing sustainable options to help meet customer and brand owner needs.

Mexico has an incredibly skilled workforce. Additionally, Mexico's open trade agreements and favorable trade relations make it attractive, as well as its proximity to the US. When considering transportation and logistics Mexico is ideal for quickly and conveniently transporting products to our facilities and customer-base in the US.

To what extent is the topic of sustainability influencing LyondellBasell's R&D investments?

We've been very clear that we want to lead on circularity. This leadership requires leaning into innovation and developing technologies, which has been a priority for us as evidenced through some of our latest products, technologies and joint ventures.

With our partner SUEZ, we formed an industry-leading mechanical recycling joint venture: Quality Circular Polymers (QCP). As the circular economy grows, we see a business opportunity. We are investing in the development of advanced molecular recycling technologies. Our goal is to bring this approach to commercial scale. 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.

Our Circulen brand of circular polymer solutions offers complementary, innovative sustainable products to help address the global challenges of plastic waste in the environment and climate change, while meeting customer and brand owner needs. CirculenRecover polymers are made from plastic waste through a mechanical recycling process; CirculenRevive polymers are made using an advanced (molecular) recycling process to convert plastic waste into feedstock to produce new polymers; and CirculenRenew polymers are made from renewable-based feedstocks such as used cooking oil, using mass balance approach. ■

Sergio Paredes

CEO
RESIRENE

Can you tell us about Resirene's production capacity?

Resirene produces polystyrene in its different families like GPPS (general purpose polystyrene), high impact, and SMMA (styrene methyl methacrylate), and our combined capacity of these production lines is 200,000 tonnes per year (t/y). We also have an additional 20,000 t/y capacity in compounds from different product families, including Biorene, color concentrates and styrene-based thermoplastic formulas, as well as some alloys of different polymers we produce in our compound lines.

What would you say have been the biggest challenges and opportunities of the last two years?

The winter storm Uri restricted the whole petrochemical supply chain and rising logistics costs have impacted everyone. However, the logistic issues in Asia made the market more localized and gave the opportunity for local companies with production capacity such as Resirene to supply demand. These dynamics have made 2021 a good year for our company.

Although demand for polystyrene has improved in 2021, the response capacity from supply chains such as Pemex has become more inconsistent. 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. Fortunately for us we have not had energy shortages, but rising costs put pressure on margins.

Can you give examples of how the topic of sustainability is influencing Resirene's product lines?

Sustainability is fundamental for Resirene and we are developing technologies for polystyrene recycling that look towards meeting all ESG criteria, which are becoming increasing valuable for the market, shareholders and clients. Our Biorene product, which is biobased, has started to receive more traction and market demand. However, due to misinformation, clients are becoming confused because authorities will prohibit plastics unless they are compostable. Biorene is not compostable; it is an intermediate solution. We trust authorities to take the proper steps like those taken in Europe and Canada to promote recycling. ■

AGROCHEMICALS

"We firmly believe that pesticides are an integral part of the agricultural value chain because without their appropriate use, the FAO (Food and Agriculture Organization of the United Nations) predicts that agricultural production would decrease by up to **40%** worldwide."

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

Image courtesy of AMVAC

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.

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 nematicide Corteva is planning to launch in 2022: "Salibro controls parasitic plant nematodes 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, 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 ap-

Better education is needed regarding where food comes from, with real, scientific basis. Society must be made aware of the importance of food production and protection.

Luis Eduardo González

President
MEXICAN UNION OF AGROCHEMICALS MANUFACTURERS AND FORMULATORS (UMFFAAC)

What would you say are the biggest challenges currently facing Mexico's agrichemicals industry?

The biggest challenge is regulation: well defined laws and guidelines that allow us to access new molecules internationally and 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.

Safety in the field is also very important. Hundreds of agrochemical transport trucks get stolen in Mexico's roads every year.

Finally, better education is needed regarding where food comes from, with real, scientific basis. Society must be made aware of the importance of food production and protection.

Which less developed regions of Mexico do you think have the best prospects for agricultural growth?

Veracruz, Tabasco and Campeche have very good potential for citruses like limes: these regions have learned to handle this crop and are growing as exporters. Another area of growth is berries, which has extended beyond the north of the country in regions such as Bajio, Jalisco and Michoacan. Nowadays, mezcal production from Oaxaca is growing a lot thanks to the drink gaining wider global recognition and a wide range of producers: producers have 20 or 30 hectares and create a mezcal name brand with quality and prestige. In the south, we are seeing growth in Yucatan, Campeche and Quintana Roo with habanero peppers with producers dedicating more to exports.

Can you elaborate on the illegal pesticides that are used in Mexico and their impact on the industry?

The damage illegal agrochemicals are causing in Mexico is serious. Authorities are not taking it as the national security issue it is because their priorities are Covid and other political issues. They have done nothing regarding the vigilance and prosecution of the illegality of plant protection products. We have seen, to our despair, these products appear everywhere, while authorities are not enforcing the law.

Mexico is an exporting country in agriculture; even during the pandemic our exports kept growing. There are certain safety standards to trace limits of pesticides and to remain competitive the industry must eradicate the use of illegal products. We have seen in Costa Rica, when they had this problem with canta-loupe melons, the borders were closed for that product for several years. In Mexico, considering the importance of this sector, this issue must be taken more seriously.

How is the agrochemical industry evolving to lower its environmental impact?

A big advantage for the agrochemicals industry is that it uses very little water, and in most cases it does not even use water. We are also changing oil-derived products like xylene to other formulation agents that are not derived from petroleum or oil-free solvents. These have great advantages: they are less corrosive, abrasive, irritant and explosive, or not at all. All petroleum derivates stay in the soil for too long, and formulation agents for pesticides used to be practically all petroleum. Today, we use other derivates with great results. To avoid using solvents and their chemical load, companies are now looking towards water dispersible granules (WDGs).

Lastly, the industry is also making a switch to organic and biological products. Not only fungi and bacteria to control pests, but also organic chemicals and plant extracts, which are also chemical processes. The sector is veering in that direction to avoid pollution and reduce its carbon footprint.

Do you have a final message regarding UMFFAAC's vision for the coming years?

UMFFAAC is dedicated to crop protection, which is imperative to produce food. Because of crop protection, the world has been able to increase production to feed a rapidly growing population. I believe true ecology is finding an environment that allows you to keep growing, not going back to the past. We do not have another planet, we need to take better advantage of this earth, get more and better food, and the agrochemical industry is there to help.

Thanks to GMO corn and soy, production is growing and the same with many more grains. Changes in the world come from real scientific studies, not from false ecologic expectations. This must be celebrated and promoted as we need to provide confidence to traders and consumers. ■

> There are regulatory challenges as the Mexican government intends to modify the industry in a way that restricts the registration of strategic agricultural products.

Cristian García

Executive Director
ASSOCIATION OF CROP PROTECTION, SCIENCE AND TECHNOLOGY (PROCCYT)

As an organization what does PROCCYT stand for?
PROCCYT represents 70% of the crop protection industry in Mexico and our members include developers, producers and distributors of agrochemical and biological products, as well as certain agricultural companies that are substantial users of these offerings. The organization focuses on promoting the control, use and distribution of chemicals according to rigorous international standards. We firmly believe that pesticides are an integral part of the agricultural value chain because without their appropriate use the FAO (Food and Agriculture Organization of the United Nations) predicts that agricultural production would decrease by up to 40% worldwide.

What are your opinions on the government's announcement to ban glyphosate?
Glyphosate is an agricultural tool that has been used in Mexico for slightly 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. Even agencies with very strict requirements like the FDA (Food and Drug Administration) and EPA (Environmental Protection Agency) have tested glyphosate and not found any harmful side effects. The only country that prohibits its use is Vietnam, which does so on religious grounds. Misinformation is being spread by activists who started a campaign against this molecule and other pesticides. These activists are acting in favor of 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.

Who is impacted when certain agrochemicals are banned or made unavailable?
With populations growing on a national and international level, we have to think about all methods of production and analyze which method is adequate for a particular region, crop, and intended results. The ultimate goal is to have sufficient food for everybody. If a producer of one hectare of crops decides to only use organic products, there will be no real impact because the few tons of crops they produce will not impact production on a national level. But if someone with 5,000 hectares of rice cannot use certain agrochemicals, 40-50% of their crop will be eliminated, which impacts the national industry as various consumers of that product would have to compete. Crops are needed to create cattle feed, starches, syrups, and other products in addition to general human consumption. As such, the threat to agrochemicals is a challenge confronting not only the crop protection industry but also to the entire food market, from those who provide the seeds, to grain importers, to transporters and even retailers. The responsible use of legal agrochemicals should be promoted, not vilified.

What would you say to somebody who insists organic crops are healthier than crops grown with agrochemicals?
In Mexico, no more than 20% of the population would select organic products over traditional products. If you ask someone who earns a minimum wage salary whether they will purchase the organic, gluten-free loaf of bread for 80 pesos or the fibrous bread for 30 pesos, the response is simple. Organic products and traditional products can have the same nutritional profiles with certain indistinguishable differences, yet there will be an extraordinary contrast in price. For many people these products are not accessible. Additionally, regulatory standards for organic products are not as extensive as those for agrochemicals. Ultimately, what we eat as consumers has to do with taste, price and accessibility. Organic products are not bad, but they cannot support the entire agricultural market.

What does PROCCYT see as its priorities for the next three years?
PROCCYT's objectives for the next three years are based on the challenges it sees in the industry. First, there are regulatory challenges as the Mexican authority intends to modify the industry in a way that restricts the registration of strategic agricultural products. Next, there is the challenge of improving communications with consumers of agrochemical products. Consumers need to be educated on how many years and millions of dollars are invested into the science that makes sure these products are safe. Lastly, we see a challenge in integrating our value chains so that we can better defend agricultural processes and the right to food protection. The Mexican administration should not be able to make decisions based on ideology or certain activist groups but rather based on scientific evidence. ■

Carlos Jurado

Latin American North Business Director
FMC

> FMC is challenging itself to have completely sustainable products by 2025, which means products with low residues, low impact, a green toxicity label, and a different mode of action.

What were the main highlights and challenges for FMC in 2021?
Despite complications with costs, imports and supplies, and with COFEPRIS and the renovation of registrations, FMC had its best year ever. This performance is the result of several important measures that FMC has taken: we reduced our portfolio by 15% but added a group of 15 elite products, which gave us a better market position. At the beginning of the pandemic a high increase in costs was followed by the rupture of the supply chain, however, the agility of FMC mitigated the impact of this. In the end, what affected us the most had to do with regulatory issues due to the renovation of registries.

FMC wants to commercialize 100% sustainable products with minimal residues on crops by 2025. What is the company's strategy to attain this target?
FMC is challenging itself to have completely sustainable products by 2025, which means products with low residues, low impact, a green toxicity label, and a different mode of action. In the biologicals market, FMC has put some products out, but we plan to position them more decisively in 2022. Our current sales in biologicals are approximately US$9 million per year, but we have a plan is to double this figure in the next three years. Synthetic chemistry has an important role for FMC, but biologicals will also become a priority.

How are challenges such as government regulations with regard to agrochemicals impacting FMC's investment plans in Mexico?
We currently develop new synthesis products in Monterrey with a partner company; a large factory with whom we have been working for 25 years on the development of bifenthrin and carbosulfan synthesis, among other products. FMC wanted to expand its new synthesis product development in Mexico to break our dependency on China. However, this particular investment had to be stopped because of the uncertain times we are living under the current Mexican government. That said, FMC will continue investing in its business in Mexico in commercial and marketing areas, and then continue investing in synthesis when we see more clarity from the government.

Can you elaborate on FMC's commitment to gender equality and equal opportunities?
Gender equality and equal opportunities are a priority for FMC. Every month we have at least two virtual meetings to discuss inclusion and gender equality, as well as race and age discrimination. Furthermore, we have monthly training in the company with special guests. We are very proud to share two interesting statistics that show progress: at the end of 2020, female participation in FMC's Mexican workforce was 23%, but today (December 2021) it is 28%. Our pool of interviewee candidates should be at least 50% women: the process does not begin if it is not balanced.
Another initiative that we launched recently is a program called 'Women United For The Field', which involve events lead by our female team where women from areas like distribution, purchases, technical, packaging and growers are invited. We had the first event in Queretaro, then the Agrifood Expo in Guanajuato, and then in Jalisco. FMC's aim is to establish a national network and then expand it through North America to strengthen gender equality in our organization and the agricultural sector.

What contributed to FMC winning awards at the Crop Science Forum & Awards in 2020 and 2021?
In 2020 FMC won best R&D pipeline and best new biological product, for two products we are preparing to launch in Mexico in 2022 that will allow us to grow in the segments of insecticides, herbicides and biologicals. In 2021, FMC won the best farm intelligence platform for Arc, which predicts insect pressure. 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. Arc is already being used in countries like Brazil, and we started testing the platform in Sinaloa in November 2021 in preparation to presenting it to the Mexican market in 2022. ■

Nery Echeverría

Head of Sales – Mexico
BAYER CROP SCIENCE

How does Bayer Crop Science use innovation to increase the sustainability and yield of crops?

First, global level seed research is made on parental lines looking for tolerance or resistance to some pests and diseases. When those are identified, we cross them with local mother seeds so they can settle with the hybrids sold in our country. Notably, a great deal of the research generated in Mexico is exported to other countries; an example is 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. That is a little of how our global research on seeds creates applications based on each country's needs. This contributes to sustainability by producing more tons per hectare, while other technologies provide more efficient water use. Our agrochemical solutions and biological products also look to reduce their chemical load, that is, less chemicals per hectare, which makes a more sustainable production.

What would you say are the biggest challenges facing Mexico's agrochemical industry?

The two biggest challenges for the agrochemical industry are, first, regulatory: making sure there is legal certainty for permits, registrations and renewals. The second challenge is that over 15% of the agrochemicals used in Mexico are estimated to be illegal, representing over US$200 million per year. This seriously harms the farmers' productivity, the whole industry chain, the environment and the consumer. ■

Ana Claudia Cerasoli

President – Meso-Andean Region
CORTEVA AGRISCIENCE

Can you describe Corteva Agriscience's activities in Mexico?

Our Meso-Andean activities are managed from Guadalajara, Mexico, where we have had a presence for over 40 years. Over these years we have expanded our footprint across the country, establishing five R&D centers which allow us to develop products that are well adapted to conditions in Mexico, as well as the US, Europe, and Canada. We directly and indirectly employ more than 1,200 people in Mexico – a country we believe will have one of the largest increases in food production in the coming years.

What is the Global Food Security Index (GFSI) and what issues has it highlighted?

The Global Food Security Index (GFSI) measures the level of food affordability, availability, quality, safety, and more recently, natural resources and resilience across various countries. It is a source of information which drives government decisions and legislation, as well as the industry's R&D focus. Looking at Mexican results, we can clearly see areas where the country has improved and where attention should still be given. During the past 10 years, Mexico has improved significantly in the availability of food, which is the result of a great reduction in the volatility of the county's agricultural production. On the negative side, Mexico had a decrease in accessibility, mainly due to the average cost of food and farming in the country. Through the use of innovation, Corteva aims to empower farmers to tackle food security.. ■

Javier Valdés

Managing Director
SYNGENTA MEXICO

What are some of Syngenta's technologies that help farmers confront challenges in the field?

The first of the farmers' concerns is climate change, then there is the cost of supplies, the transfer of technology, where to market their crops, and now also the availability of labor. To make the farmer more resilient to climate change, we develop products that allow plants to tolerate high and low temperatures or extreme droughts. We have a seed treatment, for example, that produces a greater volume of roots. In the case of beans in the desert areas of Mexico instead of making 300 kg per hectare, they can now produce 800 kg. Our innovation also seeks to give farmers a greater ROI by changing technological solutions. We work on knowledge transfers with a team in the field, demonstrating our products on the farmers' own plots. For example, 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 the farmer with a sprinkler backpack can control one hectare in a day without help. This means they can spend more time on other economic activities. This also has a major ecological impact, because when they did manual control they moved the soil, and with the rains, that loosened soil ended up in a river or the sea. Research companies like Syngenta play a key role in food production. If we did not have protection against biological problems such as pests, diseases and weeds, the world would lose 40% of its agricultural production. ■

plications 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."

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 derivates. 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. "Although grain prices skyrocketed in the US during the second quarter of 2021, the Mexican farmers were not so lucky. If they buy supplies at these prices and the market changes before they sell their products, they could go broke."

Unlike US competitors that can borrow at 3% interest, Mexican banks are far more cautious, especially during the pandemic, and the result is a lack of available credit. Looking ahead, Gaytán warned of consequences that seem difficult to avoid: "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." ■

AMVAC is reviewing its portfolio to see which products can be replaced in the future with new technologies.

Marco Salcedo

Director General – Mexico
AMVAC

What have been the main highlights at AMVAC in Mexico over the past year?

Since we last spoke, we have been through a deep restructuring process in Mexico. In October 2020, AMVAC announced the acquisition of Agrinos, a biological company that had been operating in Mexico for more than 10 years, to complement our portfolio of biologicals. The integration of these products has allowed us to better face the needs of the market. In 2021, we will nearly double what Agrinos had done in the past, which translates into excellent growth for us.

On the chemicals side of the company we also saw excellent results this year. Our traditional portfolio will grow close to US$5 million and over US$2 million through acquisitions. Alliances with other companies have also generated great results.

Can you explain how the company's portfolio is split between chemicals products and biological products, and what has been stimulating growth?

Our biological products are still a relatively new, growing portfolio. We introduced a strong field presence here, especially in vegetables, bananas, sugar cane, pineapples and agave markets. We were very active in soil insecticides and we are working to increase our market presence.

The doubling in fertilizer costs has helped stimulate demand for the types of products that help the crop to better assimilate nutrients. We maintain a permanent search for other compounds that can complement AMVAC's current offerings, helping us to grow. Lastly, the fact that AMVAC has five plants in the US as well as one in Sonora, Mexico, to supply most of our needs represents an additional advantage.

How can technology help improve the sustainability of farming operations and help feed an ever-growing population while at the same reducing their environmental impact to combat climate change?

We are living in exciting times given the available technologies. AMVAC is currently working on bringing to Mexico technology that allows you to collect and share data on your carbon footprint. This way you can more efficiently track the reduction of carbon emissions. This technology was launched in the US in 2021 with great results, so we are excited. At the end of the day, it is not just about saving products, but helping the environment.

By 2050, we need to increase our crop productivity by 70%. We do not have enough additional land to do that, so we need to think about how to increase productivity. 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 by AMVAC, which combines chemical and biological concepts to help prevent soil depletion and improve control of specific problems, such as Fusarium in agave.

Can you elaborate on how AMVAC develops new concepts in the field?

AMVAC was not used to do research within Mexico. Instead we brought in technology developed in the US. In 2020 we started our own research and development department, which has allowed us to do our own testing. With this effort we developed products such as a biological nematicide and a surfactant, and we are working on new concepts for Mexico conditions; having the opportunity to work with growers in this new technologies is a huge bonus.

What are your thoughts on the actions of the Mexican government regarding agrochemicals?

In my view the government should act based more on research than on ideology. Additionally there is a huge jam in the registration process, so when new compounds that could help growers are developed, the new technology cannot be applied. We are mainly using products that were registered three or four years ago. Our government should start by reviewing this regulatory process and then turn to a research-based approach to support this industry.

Of the different crop markets in Mexico, which do you see as having highest potential for growth?

Over the past five years, berries have become huge in Mexico, as have avocados, and the market has a lot of potential. Additionally, vegetables will continue to be the flagship crop. Our weather, soil and sun conditions are great for growing fruits and vegetables. They even taste better.

We also must start looking for different markets in addition to the US. Today, we are turning our attention to South America, Asia, and Europe as the demand for Mexican products grows. ■

Here in Mexico, Grupo Lucava is a great trader of sulfur, and our sulfur is famous for its degree of grinding and its higher quality than our competitors.

Manuel Gurrola

President
GRUPO LUCAVA

Can you briefly explain the history of Grupo Lucava and describe the company's mission?

Grupo Lucava is over 50 years old and was named after its founder, Luis Cano Vazquez. A group of shareholders and I acquired it from his widow in 1987 and we have been in the Mexican agrochemicals market since then. Our company produced malathion, an old insecticide, however, we ceased production to focus on the sale of formulated products and today we are in the national market providing products to Mexico's agriculture sector.

Our mission is to bring health to the field: heal crops and protect them from bugs and parasites. Grupo Lucava has been growing on average 16% every year during the last 10 years and today our company has approximately 220 collaborators.

What range of agrochemical products does Grupo Lucava offer, and which crops do they apply to?

Lucava's products are insecticides, fungicides, foliage fertilizers, a line of sulfurs, and we have entered the Mexican urban sector with rodent, cockroaches and mosquitoes control products. We also have a new line of seeds, and we want to diversify because in our plant we can make both chemical and organic products.

We are in practically all crops: from corn to berries. Our products are widely used in avocados, tomatoes and cucumbers, to name just a few. Each crop has very specific problems and we have specific solutions for all of them amongst our fertilizers, insecticides, herbicides and fungicides.

What have been the biggest challenges for Mexico's agriculture industry in 2021, and how do you think the Mexican government could better support the agrochemical industry?

Logistics is one of our biggest challenges now. We are at risk of facing shortages due to China's problems with energy, which forced them to close some plants, making products scarce. There is also a lack of containers, which raised their price fivefold, and we even need to enter a waiting list to get them. I think the situation will not get back to normal until the second half of 2022.

Regarding the Mexican government, it could expedite COFEPRIS' product registration: if COFEPRIS was slow before the pandemic, now it is worse. Furthermore, I do not consider their criteria for import permits to be professional but rather ideological. 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.

Can you tell us about Grupo Lucava's organic products?

We are developing new products through our innovation department with mixtures and tests and trials, and have three approved patents. Here in Mexico, Grupo Lucava is a great trader of sulfur, and our sulfur is famous for its degree of grinding and its higher quality than our competitors. With it we are creating mixtures for plants because besides being a fertilizer, sulfur is also an acaricidal fungicide and is used for pH regulation.

To what extent is the topic of sustainability influencing the agrochemicals market?

There has been a migration from chemical to organic products, but it is very slow because there are still no organic products that could solve all the problems faced by the field. However, the market for organic products is growing and exporters are the ones who are taking the most care to use fewer chemical products. In Mexico, most chemical products leave no traces and pose no danger because dangerous chemicals have been banned already. Although this is a noticeable trend, I think it is a long way to go to make a full switch to organic.

What are Grupo Lucava's main objectives and priorities for the next two years?

Lucava's main objectives include a sales increase of 20% per year and obtaining registries for the more than 40 applications we have submitted to the COFEPRIS. As for our plant, we believe it will not take us more than two years to saturate, which is why we are looking for new facilities to expand and maintain the sales growth we expect.

Training of personnel is also a fundamental part of our growth, which is reflected in sales and profits. We are currently developing Lucava University, which started five years ago, and we want to obtain the permits from the Secretariat of Education to have our courses officially recognized. From there, we can develop our personnel, their children, and others interested in our training. ■

Challenges and Opportunities in the Agrochemicals Sector

"The Mexican government's list of materials that must be recycled leaves room for interpretation when it mentions pesticides and agrochemicals and excludes many widely used supplies. This list should be more clear.

Secondly, the government halted its operations against companies that sell without a COFERPIS 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. The Mexican government should get involved to stop this trend."

– Francisco Ortiz,
Director General, Altiara

"The importance of the use of nutrients and plant growth regulators have been developed and researched a lot more these past few years by plant physiology researchers. Valent has taken the lead in this space which has allowed us to offer distributors and the people take who care of the crops additional tools, like amino-acids and nutrients, to help fight the stress a plant suffers and achieve a better yield. Additionally, the concept of Plant Intelligence aims to increase the presence in the field to generate a demand with a support tram dedicated to lead this initiative, promote the use of products to complement the nutritional and physiological value of plants to bring better yields and quality, and above all, to demonstrate the quality of our products with tangible benefit."

– César Parada,
Director General, Valent de México

"One of the challenges with respect to technology adoption 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 to be adopted. An example would be corn seeds; to go from a creole seed to a high-performance seed for a reasonable cost we gather 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, which is moving from corn to agave for the production of mezcal. The mezcal producers are looking for financing and technology, and that is where we come in."

– Jorge Alfredo Casas García,
Director General – Commercialization and Marketing, Agri Star México

"Our main challenge as an industry is for the government to understand the importance of agrochemicals in the food chain. Crops, as is the case for human beings, have the possibility to be attacked by pests, diseases and virus, etc, and in order to be cured require specific medicines. With the growing population and food demand increasing, and with a limited new agricultural area, the need to increase the yields of the crops and avoid the attack of pests and diseases is fundemental. According to the Food and Agriculture Organization (FAO) without the use of crop protection products 40% of the crop production would be lost."

– Fernando Vera Hernández,
Director General, Grupo Versa

SPECIALTY CHEMICALS

"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."

- Luis Espinoza Rueda,
Director General,
Productos Químicos Industriales de Puebla S.A. de C.V. (PROQUIPUSA)

Image courtesy of Macropol

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 Chemical 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, 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 chemi-

> Evonik has recently launched our pool of activities to support industries in moving from a linear economy into a circular economy with the help of specialty chemicals.

Martín Toscano

President
EVONIK INDUSTRIES MEXICO

What are some of the standout opportunities Evonik has seen in Mexico in the last two years?
Evonik performed extremely well in 2021 on the back of significant growth in 2020. In the first year of the pandemic, our growth in Mexico slowed less than in other places globally – a direct consequence of the minimally restrictive lockdowns Mexico implemented to support the local economy, especially the manufacturing value chains for regional and export markets.
I believe that Mexico and Vietnam are the answers to the "China + One" question that the US is trying to answer. Many companies have become interested in setting up shop in Mexico due to the United States-Mexico-Canada Agreement (USMCA), as well as the European-Mexico free trade agreement. Furthermore, Mexico should benefit from the Biden administration's new US$1 trillion stimulus package. The country has a competitive advantage in terms of logistics, labor costs are very competitive, and there is abundant young talent available. To take advantage of these opportunities, industry and local authorities should collaborate in finding a common and sustainable agenda to develop Mexico's manufacturing sectors.

To what extent have the supply chain and logistics issues that have characterized 2021 highlighted the importance of fostering stronger regional supply chains?
One of the key learnings from the global logistics disruptions has been the importance of developing local and regional supply chains. We know that the situation is not going to improve before the second half of 2022 probably, and it is the reason why we are seeing inflation rising. Evonik is fortunate to be part of not only a global group, but also a regional platform which gives us access to a significant number of manufacturing assets allowing us to react quickly to changing market dynamics.

How much do you think government rhetoric impacts sentiment towards Mexico as an investment destination?
Over the past two years FDI has decreased globally, but things have now started to return to pre-pandemic levels. Mexico was affected by the decrease in investment, but less than other countries. Today, Mexico is the 9th most favored destination for FDI in the world, whereas we were not in the top 10 before the pandemic. 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. We are not only seeing new companies entering the market, but also existing companies expanding their operations and footprint.

Why are specialty chemicals important in the transition to a circular economy?
One of the reasons Evonik continue to show significant growth is the company's resilient and diverse portfolio of specialty chemicals. We play an important role in the market not only with the products we sell, but also with the solutions our products bring to the table in terms of new applications.
With specialty chemicals, you can find the solution to many challenges in several market segments and processes. For instance, Evonik has recently launched our pool of activities to support industries in moving from a linear economy into a circular economy with the help of specialty chemicals. The products we develop are not only beneficial from our own environmental footprint perspective, but also have a positive impact on the processes and technologies of our customers. We pride ourselves in that approximately 50% of the sales generated by our chemical segments come from products that make a measurable contribution to improving the resource efficiency of their applications.

Which initiatives is Evonik working on to foster talent and develop its workforce in Mexico?
Human capital is one of Evonik's biggest assets and therefore we continuously implement initiatives to develop talent. This is geared to recognize the potential of our employees at an early stage, develop them, and point out possible career paths within the company. A wide range of training and professional development programs are offered at segment, regional and site level to ensure that employees are well prepared and can build upon their skills. Key goals for employee development include personal responsibility, diversity, internationality, and entrepreneurship.
We see diversity as a key to corporate success. This means fostering creativity, trying out new things, and better understanding customer needs. ■

> PVC, compared to other polymers, is one of the most sustainable as it only uses 43% of crude oil or natural gas, and the rest of the makeup is mineral salt.

Maggie Gómez-Rábago

Director General
CHARLOTTE CHEMICAL

How has Charlotte Chemical performed over the last two years and which business lines have shown the most demand?
Charlotte Chemical had a surprisingly good year in 2020 considering the context of the pandemic, with the company selling the same amount in US$ as the previous year. In 2021, our focus was to increase our sales by approximately 12%, but we have performed so well over the past few months and expect to close the year with a sale increase of 30%. This increase has not been in terms of price, it has also been an important increase in volume and number of products.

Considering the supply chain and logistics disruptions of the last year, what is your strategy to maintain product inventory and mitigate cost increases?
The pandemic required Charlotte Chemical to be very creative and adapt. Worldwide, there has been an insufficient number of freights and logistics costs increased tremendously. In some cases we even paid more for the freight than for the product, which would impact the competitiveness of any business. However, even with the logistics price increases our products have fortunately remained in demand as there are no other local companies manufacturing the products we sell. We were in a situation where we needed to adapt and find new routes and ways of bringing products into Mexico to remain competitive, but our creativeness has given us the opportunity to grow Charlotte Chemical's market share.

To what extent is the increasing demand for greener products influencing Charlotte Chemical's portfolio?
Today when adding new products to our portfolio one of the criteria for inclusion is that the product needs to be sustainable. That means the product either needs to be biobased, have low volatility, or be environmentally friendly. For example, the plasticizers market is generally punished by the public as they argue that phthalates are bad for health. Therefore, Charlotte Chemical is trying to move to more sustainable products and most of the plasticizers we are selling are phthalate free. Going green is not only the right thing to do for the planet, but from a business perspective the company's increased volume of sales are mostly green products.

Many chemical companies are increasingly investing in the specialties market. What are the main differences in this segment compared to the commodities space?
Selling specialty chemicals and selling commodities is very different. With commodities, the most important value add is having the product available at a good price and in large volume, and if you comply with these factors, it is easy to sell your product. With specialty chemicals, you need to be more technical. Charlotte Chemical's entire sales team are chemical engineers as they need to understand the product and be able to recommend the best solutions for each customer's needs.
In the specialty market, you also need to be patient. For instance, Charlotte Chemical has three new products on the market this year. One is already selling, but with the other two, we know it is going to 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.

How are the VOC regulations impacting the coatings market in Mexico?
The VOC regulations have been well adopted by the large and medium sized companies, but the smaller companies have been lagging in adoption as the solutions are more expensive. The challenge is to regulate all coatings that are sold on the market in order to really have safer and less contaminated products, as well as working with the government to educate them so that the coatings market is regulated properly.

Which area of chemical industry do you see as having best potential for future growth?
The PVC industry has always been one of my favorites and it is always going to be relevant. PVC, compared to other polymers, is one of the most sustainable as it only uses 43% of crude oil or natural gas, and the rest of the makeup is mineral salt. The PVC industry has continuously been transforming and has used opportunities to find new niches in various markets. Today, the construction industry holds the largest share of PVC applications. The PVC industry is also continuously looking for more sustainable additives as to be more environmentally friendly. ■

> A focus on moving towards specialty products is linked to the necessity to innovate, which in turn is linked to climate change and the general challenges we are seeing in each market.

Rafael Méndez

Regional Director – Latam Northern Tier
CRODA

Of the different markets that Croda works in, which have proven to be the most resilient in Mexico throughout the pandemic?
The personal care and healthcare markets in Mexico have contributed significantly to the company's success and record sales. The pandemic encouraged higher interest in personal care and we have seen significant growth in the consumer health market over the past year. With the green agenda receiving ever more attention everyone is looking for cleaner and greener solutions and are increasing their bio-based content in products. Croda is committed to be climate, land and people positive by 2030 and we want to be the most sustainable supplier of innovative ingredients where we will help provide solutions to some of the world's biggest challenges in the coming decades.

65% of Croda's raw materials currently come from bio-based resources and the company wants to increase this percentage to 75% by 2030. How does the company intend to achieve this?
Croda's goal to achieve 75% bio-based content by 2030 is directly connected to the company's investments in its facilities and M&A activities. All of our plants have a decarbonization program as well as an increase of bio-based content plan for each of our operations. We are running specific projects in each of our business sectors to incorporate bio-based materials. Croda's progress in this regard was recently ranked first in Barron's Most Sustainable International Company's list.

Croda acquired the fragrances and flavors company Iberchem in 2020 and Alban Muller in 2021. How have these M&S transaction boosted the company's offerings in different sectors?
The Iberchem acquisition complemented our personal care business as a whole and Croda is now one of the few companies in the world that can provide an integrated solution in all perspectives in the personal care markets – such as active, functional and base ingredients. Today we offer complete formulas, fragrance included, to the haircare and skincare space.
Croda acquisition of Alban Muller, a company with an important portfolio of botanical ingredients, increases our bio-base content and the naturality of our ingredients. We offer an integral solutions to our customers while ensuring naturality.

Why do you think many chemical companies are increasingly focusing on specialty products?
A focus on moving towards specialty products is linked to the necessity to innovate, which in turn is linked to climate change and the general challenges we are seeing in each market. There is a strong requirement for innovation stemming from changing market needs. Croda has always had a focus on innovation and sustainability and we are continuously reinforcing these pillars to stay ahead of the competition.

How has Croda's partnership with Pfizer developed since signing a contract to supply components for the Covid-19 vaccine?
Entering into the partnership with Pfizer has been very strategic and we continue developing this relationship. The relationship has strengthened from a manufacturing and supply perspective as well as from a collaboration and innovation perspective. We are proud to say that Pfizer and the healthcare market can count on Croda's innovations and technologies for future challenges.

Can you elaborate on Croda's three pillars for innovation?
The company's three pillars of innovation are internal innovation, open innovation, and technology investment. Internal innovation is delivered by our people and managed through our innovation centres to give our customers access to the expertise and knowledge that will develop and deliver the products that will deliver against their unmet needs. Our open innovation pillar is focussed on having collaborations with institutions and universities as we recognize that a collaborative and open approach to innovation often accelerates time to market and provide product or process differentiation. Croda's technology investment group is the function that drives the acquisition and licensing of innovative technologies and currently we focus on bio-technologies.

Where does Croda see room for growth within the Mexican market by 2023?
Croda strives to grow significantly within the entire life sciences sector and aims to accelerate in the prescription drug and vaccine areas. We also want to see strong growth in the crop care sector. In the personal care space we are adapting our solutions to new market needs and will continue to provide integral and sustainable solutions to our customers. ■

cals 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.

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." ■

Isis Hernández

Commercial Manager
MACROPOL

Can you explain how Macropol has evolved?
We were initially focused on a single market – the area of additives for plastics focused on PVC transformation. Through time we incorporated other additives focused on polyolefins and engineering plastics, and when we realized that some raw materials used in the manufacture of plastics could be used in cosmetic applications, we also entered that market. Over the years we have been adding sectors that have provided us with better guarantees, benefits and negotiations thanks to economies of scale, having different applications for the same product in the chemical sector.
We handle practically everything to do with additives. In the plastics sector we distribute functional and process additives. Each provides a very different feature. 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. We have other materials such as defoamers and pigments for industries such as paints and coatings. Depending on its application, the same material can be classified by its utility in totally different ways.

Which areas of business do you see as having strong potential for growth in 2022?
At Macropol we are looking for our plastics to have a faster degradation than the 100 to 120 years they normally have. In the cosmetic area we stopped using certain products in sunscreens that pollute the seawater. In the pharmaceutical part there are new diseases and new drugs are being developed, and we can get involved in the creation of physical forms through the represented companies we work with. We take great care of the pharmaceutical part and have a warehouse dedicated to chemical products in order to avoid contamination. ■

Luis Espinosa Rueda

Director General
PRODUCTOS QUÍMICOS INDUSTRIALES DE PUEBLA S.A. DE C.V.

PROQUIPUSA celebrates its 35th anniversary in 2021. Where is the company focused today?
PROQUIPUSA is still focused on specialties but we operate in a wide range of markets including chemicals, plastics, home and personal care, lubricants, textiles, leather, coatings and inks. We also produce and distribute additives for the plastics industry: antioxidants, UV protection, flame retardants, optical brighteners, clarifying and nucleating agents and additives for recycling.
Overall, 2020 and 2021 have been challenging years with a 30% decrease in sales due to the lack of raw materials and finished products. We have been hit the hardest in our masterbatch production, additives, and lubricant segments. The home and personal care industries have however seen growth, especially with regard to sanitizing products. The pandemic has been an eye opener for B2B business and we were forced to make our own brands. Today, PROQUIPUSA has its own brand for sanitizers, essential detergents and cleaning products. Our objective for the next year will be to focus more on online sales platforms to enrich our sales team's efforts. Nano technologies in detergents are advancing significantly and we intend to launch a new range of nano and anti-microbial products in 2022.

Why do you think there is a trend of companies increasingly focusing on specialty chemicals?
With regard to certain commodities, extremely big joint ventures make it almost impossible to compete. Smaller companies are thus 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. Moving into the specialty market differs from the traditional way of selling and the sales term for specialty chemicals can be as long as two years. ■

José Luis Guzmán

Director General
CASTROL MÉXICO

How has the global shortage of semiconductors for the automotive industry impacted business?
New cars sales were improving in the first quarter of 2021, but as the shortage of semiconductors has become more acute sales started falling again, though not to the same level as Q2 2020.
Castrol has not been affected by this in the open market yet because our market is more focused on used vehicles. 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.
Customers are interested in high-quality products when they understand it allows them to spend less time changing oil in the long run. It is better to buy something good than something cheap you have to change 10 times, especially now that supply is limited.

How is Castrol positioning itself for the move towards electric vehicles?
In Mexico the demand for electric vehicles is currently below 2%. However, Castrol is very involved with car companies developing the future of lubricants for electric cars. Nowadays the oil you put into your car is a liquid lubricant. In electric cars, a big portion of these fluids will be greases. Castrol is working with these greases and we have a project with Jaguar and Land Rover in Formula E. These products that are already net zero will be used in the future by electric cars.
In the near future Castrol will not only be lubricants but also a transformation business. For example, in Europe we are doing business with department stores who are installing chargers for electric cars. Castrol BP is a leader in the development of this technology, which aligns with BP's clear goals on the path to net zero emissions by 2050. ■

Pedro Bojacá

Managing Director – Mexico
LANXESS

How have the industries that Lanxess supplies chemicals to rebounded in 2021?
We had an especially big rebound at the beginning of 2021 with our production of plastics for the automotive industry, but this is now cooling down. Other areas have been more consistent, like those related to disinfection and construction.
Lanxess has also been changing its portfolio of products in 2021. We divested our businesses in chromium and chemicals used for leather, for example, which were traditional products Lanxess offered. We acquired a few interesting companies including Emerald Kalama Chemical, an American business that produces benzoates and fragrances. Lanxess now has a new business unit focused on flavors and fragrances. We just announced the acquisition of IFF's microbial control business and we expect to have these materials in our portfolio by the second half of 2022.

Why are chemical companies moving into the specialties space, and what can Lanxess do to stay ahead of the competition?
Companies are trying to operate in markets that provide better outcomes for investors and society, such as products that contribute to a more sustainable environment. Furthermore, we have seen that certain specialties like fragrances or disinfectants offer higher profit margins. Lanxess is thinking about its future not simply by looking at the industry but also at what is best for humanity. We have a climate neutral goal for 2040 and we keep our carbon footprint in mind whenever we choose a new target to acquire.

Can you provide examples of Lanxess' sustainable initiatives in Mexico?
We have a facility in Altamira that produces additives for lubricants and rubber, a process that requires a lot of water. To eliminate waste 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. ■

PAINTS AND COATINGS

"Consumers are also more focused now than ever on products that are not harmful to the environment. This is a trend that will continue and will remain especially relevant for the architectural paints and coatings segment."

- Flor de María González Mariblanca,
Director General,
Mexico's National Association of Paints and Inks Manufacturers (ANAFAPYT)

Image courtesy of ANAFAPYT

Paints & Coatings

Rising prices see consumer demand and sustainability trends move in different directions

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."

Perez added that demand for more sustainable products largely comes from international brands like PPG, not necessarily Mexican-based companies, who often discover while marketing their environmentally friendly offerings that the end market finds them too expensive.

Maggie Gómez-Rábago, director general of Charlotte Chemical, also mentioned that the VOC regulations have been well adopted by the large and medium sized companies, but the smaller companies have been lagging in adoption as the solutions are more expensive. "The challenge is to regulate all coatings that are sold on the market in order to really have safer and less contaminated products, as well as working with the government to educate them so that the coatings market is regulated properly."

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.

> The challenge is to regulate all coatings that are sold in order to really have safer and less contaminated products, as well as working with the government to educate them so that the coatings market is regulated properly.
>
> **– Maggie Gómez-Rábago, Director General, Charlotte Chemical**

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. "As a result, an important point for the next two years will be to raise agreements with manufacturers and distributors."

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. ■


AZ


FM

Arius Enrique Zúñiga Lara & Flor de María González Mariblanca

AZ: President
FM: Director General
MEXICO'S NATIONAL ASSOCIATION OF PAINTS AND INKS MANUFACTURERS

Can you detail ANAFAPYT's main priorities, including the challenges faced by your members?
AZ: The global environment for manufacturers and suppliers in the industry has been extremely complex, especially given the weakness of supply chains. ANAFAPYT members have had to charge customers more for the same products, which presents one of the main challenges.
However, there are also many positives. As an association, ANAFAPYT has been very active reinforcing its alliances with members of all levels of the government as well as many organizations. The association continues to grow as the leading voice for members of the paint and coating industry.

How have different segments within the paint and coatings industry performed in recent years?
FM: Performance in the architectural segment in Mexico in 2020 generated 716.1 million liters of paint, with emulsion paints representing 76% of the total volume. In the automotive segment national consumption of paint was 134.7 million liters. This generated an estimated value of MXN 13.5 million in 2019, with the average price per liter of MXN 100. Lastly, within the industrial market national consumption of paints generated an estimated value of MXN 134.7 million in 2019.

What trends have you seen develop within different sub-segments of the paint and coatings industry over the past year, and what is your perspective on their development in 2022?
AZ: We hope that prices will start to fall, but they will not get down to what they were in 2019. As a result an important point for the next two years will be to forge agreements with manufacturers and distributors. ANAFAPYT plays a fundamental role in this unity.
People are not buying new cars as much as they used to as a result of economic uncertainty and shortage of semiconductors. While this impacts our industry, people are increasingly repainting their cars instead of making a new purchase. Additionally, we have seen that many companies will likely never return fully to the office, which means home offices are more important than ever. There has been a rise in Do-It-Yourself trends growing the sales of paints and emulsions in this sector by 20% in 2020. We have also seen increased consumption in the construction sector as a result of the government's investment into public works. For example, the organizers of a project to recover the Train Maya recently reached out to ANAFAPYT to see which members would be interested in being a part of the project.

What are your views on the volatile organic compound (VOC) regulations for architectural coatings?
FM: The technical rules have to include a process of evaluation and conformity with the standards they list. ANAFAPYT 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.
AZ: Each member of ANAFAPYT is very convinced of the importance of a green economy and adopting sustainability measures. We do not follow norms because we have to, but rather because we are conscious of our social responsibility. The goal would be for Mexico to arrive at the levels of international standards.

What can attendees expect for the 2022 Latin American Coatings Show?
FM: We are very happy that LACS will return to an in-person show at the Citibanamex Center in Mexico City, from July 26th to 28th, 2022. We estimate there will be around 5,400 attendees joining us not only to display their products but also to attend various panels we have planned. We will hold talks regarding technical updates, sustainability measures, economic trends for 2023, and a variety of other topics.

How would you define ANAFAPYT's goals for the next two years?
AZ: We will continue to endorse ANAFAPYT as being the best consultants for the Mexican government when it comes to matters regarding the paint industry, serving as a guide for authorities on matters related to norms and regulations.
FM: Sustainability is also an important pillar of our association, and we will continue to undertake different strategies to make this more relevant within the industry. Consumers are more focused now than ever on products that are not harmful to the environment. This is a trend that will continue and will remain especially relevant for the architectural segment. ■

As a key player in the Mexican Coatings industry Reacciones Químicas has ambitious plans for expansion in the US.

Patricio Cueva

CEO
REACCIONES QUÍMICAS

Reacciones Químicas celebrated its 40th anniversary in 2021. How has the company evolved in recent years?
Reacciones Químicas has evolved by using new tools and technologies for processing and developing products. The company has continuously invested in up-to-date facilities for our R&D team in order to replicate most of our clients' processes, putting this together with our scientists Know-how and market trends information we have been able to take advantage of new opportunities focused on product performance and improvement. Most importantly Reacciones Químicas has strengthened its culture by developing its leaders and team members as they are the foundations of our company and have given form to our identity as a company.

Where does the Reacciones Químicas source its raw materials from and how is the company currently dealing with the global logistics challenge?
Our raw materials are imported from all over the globe, mostly from the US, Asia and Europe. The logistics and supply chain situation has been critical over the past year, causing a significant impact on prices. Supply chain deficits do not only affect the chemical industry but every industry worldwide. However, with correct planning and the great relationships we have with our suppliers, Reacciones Químicas has been able to effectively adapt to these conditions, mitigating challenges and sourcing what we need to in order to continue to service our customers.

How are the global green agenda and regulations such as VOC influencing the company's product lines?
Reacciones Químicas has a holistic outlook on sustainability and aims not only to include it in our products but also in our 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 that will generate approximately 470,000 KW/h per year. We have managed to reduce our annual CO2 emissions by over 2,000 t/y and will continue improving our operations to achieve even bigger reductions.
The company also has recycling and waste reduction programs to decrease our carbon footprint and energy consumption. Reacciones Químicas' R&D team is continuously working on incorporating recycled and more sustainable raw materials into its processes. Regarding VOC's, the company has been working with solvents and technologies developed specifically for the coatings market that are focused on performance and meeting the requirements of VOC regulations.

What are the main demand trends you have noticed in the coatings market in 2021, and which markets do you expect to grow in 2022?
The coatings market in general has made a great comeback in the second half of 2020, and this has continued during 2021. The market segments that have experienced a higher growth over the past months are the architectural and industrial and we expect the trend to continue for 2022.

As the company grows, how can you scale the business from a human resources standpoint?
Reacciones Químicas has been certified as a great place to work for two years in a row. The company will continue reinforcing its employee development program as a tool for our collaborators' professional growth, leading us to work hand in hand with the people to ensure they will achieve mutual goals. Our history, work culture and certifications ensure that we not only attract, but also retain the best talent available in the market.

Looking forward, can you tell us about Reacciones Químicas' expansion plans in the US?
The US is an important market for Reacciones Químicas and we are currently working through our distributing partners. In order to grow even further, we have been forming close relationships with customers so we can have a better understanding of their needs and develop tailored made products for them. The flexibility we have with our R&D team is yet another of our differentiators.
As a key player in the Mexican Coatings industry, Reacciones Químicas has ambitious plans for expansion in the US, and for this reason we are focused on sustainability and product trends in the American market so we can understand and meet their needs, taking firm steps for further growth in the medium and long term. ■

> Now innovation is no longer just about products but about logistics and business relationships. The industry is reinventing itself.

Francisco Rubio

President
KEMIKALS

We are not manufacturers; we are distributors and representatives of many lines. Our commitment has always been to represent and distribute for companies with all the sustainability certifications such as ISO 14000. It is important that behind us are companies committed to sustainability and our job is to represent them and demonstrate that we are going in that same direction.
This slogan was developed three years ago when the world was different, since when we have brought up new lines and thought of new 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. The trend of looking for increasingly greener products switched to survival mode. Now innovation is no longer just about products but about logistics and business relationships. The industry is reinventing itself.

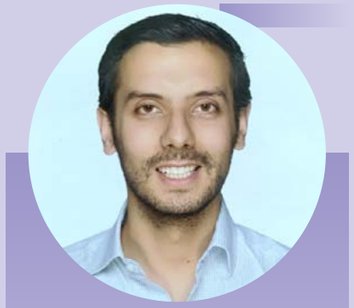
Which trends did you notice in the chemical distribution market in 2021?
International consolidation is a trend that we continue to see among the largest distributors. It is not something Kemikal's currently has planned, but if at any point this decision would add value for our customers, shareholders and suppliers, of course we would make it. What we seek is to improve our value-added ideology. The supply chain crisis brought distributors to the forefront and reminded people of our value. Previously there was a trend used to try and skip us and buy directly to maybe get better prices. However, now there are clients who wish they had known us before to leverage market knowledge and strategize together to optimize the supply chain.

What would you like to achieve with Kemikals by the end of 2022?
We would like to continue with our line of growth and consolidation and to be perceived more as a business partner. We hope that by December 2022 the waters have calmed and we can see the future with a bit more certainty and with recognition earned from customers and suppliers during this challenging time. If in bad times we were together and we got ahead, in good times the relationship can be even better. ■

To what extent did you notice prices increase in the paint and coatings sector in 2021 due to a lack of raw materials, and what measures did Kemikals take to mitigate this challenge?
There was not been a single product that did not suffer more than one increase throughout 2021, a year that was characterized by uncertainty. At first, we believed that this would last three months maximum, that by July, prices would have deflated, but they got even higher. Transportation, logistics, raw materials, everything had severe increases by double-digit percentages.
To mitigate this challenge we have returned to the basic values of Kemikals. Our mission and reason for being have always been service. All crises are opportunities and this has brought positive impacts. All companies talk about service, but it is now that you see who has a vocation, who made an effort to increase their inventory, and who were loyal to their customers. We protect our customers as much as humanly possible in these atypical situations, communicating honestly with them. If we are not going to be able to provide a product or we do not know at what price, we tell them and try to solve it together.
I think that has been a success story for us at the end of 2021. As a summary of the year, our clients would say that Kemikals protected us, defended us and worked with us.

Can you explain how the company's technical laboratories add value to clients?
We have developed an increasingly professional laboratory. Among distributors, there are many different business models, but Kemikals went a step further by catering to customers' needs not only from a commercial and logistical point of view but also from a technical standpoint. There was a shortage of many materials in 2021, so our labs have been an added value because we can offer alternative solutions with a series of in-house evaluations that allow us to recommend a product, explaining its pros and cons and whether it would be viable.

Can you elaborate on Kemikal's slogan, 'We are committed to sustainable innovation'?



Jorge David Saldaña

Chief Strategy Officer
WYN DE MÉXICO

What are the main trends you are seeing in the market?
The current lack of materials on the market has led customers to buy whatever we have in stock at the moment. That said, there are a few clear purchasing trends we have noticed this year. Because regulations are becoming stricter on solvents there is an increased demand from customers now turning towards water-based products. This has been a positive trend for us. We are figuring out how to match the performance of historically solvent-based solutions, like those used in industrial coatings, with equivalent waterborne formulations.
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. Lastly, the industry is exploring new ways of sourcing – such as using bulk options like pipelines and flexi-tanks instead of more traditional packaging as drums and totes.

Which new business lines is Wyn looking to strengthen?
Being concentrated on the emulsion polymer business Wyn can serve a variety of industries — coatings, construction, graphic arts, textiles, waxes, and even some automotive applications. Because of this, we can be very flexible with the products we manufacture. To stay competitive we are exploring different business lines on the specialty side. For example, within the coatings market, resins have become more competitive. Without taking significant risks, Wyn has started to invest more in its R&D for specialty products within the industries we serve.
Wyn is also looking to diversify geographically. We already have an important market share in Latin America, but have our eyes set on the US and Canada and we are currently developing a strategy to build a stronger base in these countries over the next three to five years. ■

Moises Silva Pérez

Business Manager
PYOSA INDUSTRIES

Can you provide a brief history of Pyosa Industries and how the company has evolved over the years?
80 years ago, Pyosa started as a company that manufactured lead oxides to be used in batteries and TVs. Because this is a raw material for certain pigments, the company began to manufacture pigments as well. From there, the company focused on expanding its dyes and pigments. In the years since, Pyosa has expanded its offerings to include a more complete set of products for its end market, including other chemicals required to make paint. The core business for Pyosa for many years was color. When we realized that the customer requires other special chemicals, like certain acrylic resins for coatings, we expanded our range accordingly. Geographically, the Mexican market continues to play a major role, accounting for approximately 80% of Pyosa's total sales.

What would you say have been the main challenges faced by Mexico's chemical industry in the last two years?
The challenges of working in Mexico in the last couple of years have not been localized or specific to the country but rather have been global issues impacting all companies in the chemical industry value chain. Supply chain issues, energy shortages, a lack of raw materials – everybody is facing these challenges at the moment. I believe they will persist to some extent throughout the first half of 2022.
Nonetheless, Mexico does have certain strengths when it comes to operating in the chemical industry. As a nation, we have a remarkable ability to survive and a commitment to do whatever it takes to deliver products to customers. Pyosa is doing just that by finding alternate sources of materials. Ultimately, however, the increasing costs of these actions will be passed along to the customers, with the final user paying the price. ■

DISTRIBUTION

"Because Mexico has reduced its production of chemical and petrochemical products, distributors now have more business opportunities. For instance, the country used to produce about 200,000 ton of base oils per year, 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."

- Alfredo Ison,
Executive President,
Química Delta

Image courtesy of Pochteca

Distribution

The chemical industry growth segment 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 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 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.

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."

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

Distributors deliver value by identifying market opportunities, penetrating new segments, gaining new customers, reaching new geographical regions and taking advantage of the trends that otherwise manufacturers should have to search or learn by themselves.

Eugenio Manzano

Executive Director
POCHTECA

Which of the sectors Pochteca distributes chemicals to in Mexico have shown the strongest demand in the last year?
Most of the segments we serve grew during 2021, especially those involved in export related industries driven by healthy growth in the US, as well as food, home and personal care. Our one-stop-shop value proposition to the more than 40 segments that we sell to and our product, client and geographic diversification strategy resulted in a strong year despite Covid and supply chain issues related to shipping and production bottlenecks in Asia and other parts of the world.

Why do you think the chemical distribution model suits Mexico, and what benefits would consolidation bring?
Chemical distributors are important to the supply chain as we can demonstrate our ability to drive growth and competitiveness, offer value-added services, easily gather market insights, and reduce complexity for manufacturers and customers throughout the value chain. Distributors deliver value by identifying market opportunities, penetrating new segments, gaining new customers, reaching new geographical regions and taking advantage of the trends that otherwise manufacturers should have to search or learn by themselves.
Mexico's geography with more than 4,000 kilometers from north to south, hundreds of small and medium cities that host thousands of 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. These are some of the reasons why Mexico has 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. 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 to customers.

How could public/private partnerships improve the raw material situation in Mexico and where would investment be most useful?
Mexico has an important shortage of competitive raw materials, including ethane, propylene, ethylene oxide, ammonia and others. Pemex could benefit significantly by allowing private industry to invest or co-invest in upgrading and maintaining existing plants and investing in new ones. ANIQ has offered economic and technical support to the Secretaría de Energía, the Secretaría de Economía and Pemex in order to improve supply conditions of these basic chemicals that would result in a more competitive chemical industry, generating more jobs and reducing the large trade deficit. Joint investments in port and logistics infrastructure would also eliminate bottlenecks and reduce costs along the supply chain. We need a strong and competitive Pemex so that our industry is able to compete in today´s open borders economy.

How is Pochteca implementing digitalization into its processes?
We are implementing a dual digital transformation strategy: optimizing current operations on one hand and generating a new customer, employee and supplier experience on the other. Digital transformation is a never-ending journey where continuous improvement is key. As we implement more intelligent and automatic sales and operations planning tools, our ability to forecast demand and plan inventory accordingly will allow us to continue satisfying customer needs. Our IT ecosystem includes tools, robots and software that allow us to process data, automate processes and lower operating costs. All this results in a lower cost to serve for our suppliers and a lower total cost of ownership for our clients.

Can you elaborate on Pochteca's latest sustainability-focused initiatives?
We are working on internal and customer facing initiatives. On the internal front, we are reducing emissions of our fleet by using better routing systems, constantly modernizing our trucks and trailers, reducing energy use in our facilities with LED, increased natural lighting and solar panels and reducing packaging waste by using sturdier drums, IBC´s and pales that can be used several times.
On the customer facing initiatives, we continue to increase our solvent recovery capacity by which we recycle and remanufacture solvent blends and recycle pure solvents to be used again in various supply chains. Our environmental services division continues to grow, offering customers waste co-processing, total waste management, zero waste to landfill programs and responsible disposal of dangerous products. With these services we are contributing to the overall reduction of waste and emissions in our industry. ■

The critical situation in product availability and rising demand has caused clients to realize that having stock is the number one priority.

N. Adriana Ramírez Millán

Chemical Sales Director
HELM DE MÉXICO

Can you provide an overview of Helm's activities in Mexico's chemical industry?
We are traders and bring raw materials to Mexico for many industries. In 2021 we are expecting to reach 90,000 tons of products into Mexico, after having 70,000 in 2020; so the year has been positive. Glycol accounts for almost 50% of Helm's product volume in Mexico, but we have also diversified the business. Our core business is bringing materials in ship-sized dimensions, with all the managing and logistics that taking those materials down to a tanker truck for the client entails. Helm has great experience and expertise in this business at a global level.

Which industrial sectors does Helm provide chemical products to?
We work with the automotive industry with glycols for antifreeze to cover the lack of local production, as well as supplying resins and handling big volumes of solvents like isopropyl alcohol and acetone. Some of the solvents are also used in paints and coatings, so we provide different raw materials for paint manufacturers. We also have supply of phosphoric acid for the agricultural industry and mining, and are now entering a new line of business for us, caustic soda, which has many uses in personal care.

Can you elaborate on the importance of phosphoric acid for the agriculture sector?
Helm distributes the Prayon food grade phosphoric acid used in irrigation systems in some regions like the north of Mexico where temperature and humidity need to be controlled.

To what extent have Helm's logistics and distribution services in Mexico been impacted by logistics disruptions in 2021?
Helm has agreements with suppliers to mitigate the impact of logistics price increases, but the biggest challenge in 2021 has been delivery times. Lead times for some products tripled, and things became even more complicated during the winter storm in southern USA in February. Far from the just-in-time model the industry was used to, companies had to stock up to cover themselves, and our duty was to manage that. We largely depend on China and the US, and freight rates from China increased four and 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. However, Helm's clients can rest assured that they will not be as affected by any of these external factors because of our strategic positions in the country with solvents and solids and our safety stock. 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, as this is not a short-term situation.

What are some of Helm's latest sustainability-driven investments in the Americas?
As a chemical company, most of Helm's products at the moment are derived from oil, natural gas or even coal if it comes from China. However, in alignment with the move towards green products, Helm has projects such as the first renewable BDO facility in the US. Companies need to find a balance between what the client is used to paying for traditional products with what they are willing to pay for green alternatives, because green products are currently more expensive due to production costs and availability. Such a context makes many clients reluctant to pay, even if they work perfectly, so I believe the transition will be gradual. We are also working together with producers of polyester and polyethylene terephthalate to promote recycling to reduce their carbon footprint.

Which areas of the business in Mexico does Helm see as having high potential for future growth?
We are seeing great progress in the automotive sector with glycols, polyethylene and resins. Acetone was the first chemical Helm worked with in Mexico and remains an important product in the company's portfolio. In resins, we are developing the styrene business, integrating Helm's services with producers, suppliers and logistics routes. Today communication with clients is as important as it has ever been to forecast availability and tell them about a month in advance. This way of working is why Helm has good credibility with clients – we can be trusted to comply with our commitments and guarantee the flow of products in Mexico's chemical supply chain. ■

Miguel Valdivia

Commercial Director
TRADE CHEMICALS & PRODUCTS

> What I have seen work is having a business partner in Mexico like TCP that can supply local products and that has the contacts and the knowledge to replace a product that has run out or has gone up a lot in price.

How has Trade Chemicals & Products' (TCP) product portfolio evolved from silicone products?

We founded this company 22 years ago focusing on the field of silicone emulsions and defoamers that have many applications in different industries. For example, silicone emulsions can be used for car care, or as release agents for rubber or in baking bread, tortillas and candies. Silicone defoamers can also be used in textile processes and in juices, pulps and tequila, and we have COFEPRIS permission for these products. 18 years ago, we started to manufacture all these products from silicone fluids; now we also make yarn lubricants for textiles and other products with silicone oil.

These products allow us to reach all kinds of industries, and as customers requested materials to complement their processes, it led us to trade other molecules such as sodium lauryl ether sulfate, pine oil, glycerin and carbomers. We also manufacture antibacterial gel and disinfectants.

What do you look for when establishing a distribution partnership with chemical companies?

Originally, TCP worked with small businesses looking for products that producers do not offer directly as they have a minimum turnover or volume, so we act as an intermediary with the financial and storage capacity to have them available. COPAMEX (Taloquimia), the main national producer of pine oil; Polaquimia, a company with more than 80 years manufacturing chemical products; and Stepan, with whom we recently made a commercial alliance, are examples of this type of companies. In addition, TCP manufacture some products that our partners do not; that way we can offer a wider variety of products. We have practically all the raw materials for detergents, with 50% of our volume being raw materials for manufacturers of cleaning products.

Can you tell us about the technical advice services that TCP offers?

We have three chemical engineers with a lot of experience; all have a lot of knowledge of all the products we handle and experience in different fields. 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. This service has also helped us increase sales. Recently, for example, we were in Culiacan, Sinaloa, with a customer who manufactures fertilizers and could not find citric acid in the market. We sent our specialist engineer who helped them replace this product.

What advice would you give to companies looking to mitigate challenges surrounding the lack of raw materials available?

Producers had saved money for years sourcing cheaper products from China, Korea and India, but today they are suffering their scarcity because they relied heavily on them. What I have seen work is having a business partner in Mexico like TCP that can supply local products, that has the contacts and the knowledge to replace a product that has run out or has gone up a lot in price. For example, in the case of antibacterial gel, when the carbomer and cane alcohol ran out, we had corn alcohol distilled, which has no bad aroma, and replaced the traditional carbomer with hydroxyethyl cellulose. We made it possible for companies that needed to manufacture this product to do so. We were very successful and sold a lot of substitute material. This is a lot more common since the pandemic: more and more materials have problems of existence or price. I think it is very important for companies to have suppliers who do not just sell a product when they have it, but who can help them continue their operations with different materials, keeping prices as reasonable as possible.

Which markets do you see as having the most potential for growth in the coming years?

The agricultural sector has been in a continuous upward trend and we expect this to continue. Of course we will also continue growing TCP's cleaning and disinfection product portfolio. In the face of climate change it is very important to follow the trend of first world countries towards biodegradable or environmentally friendly products. Chemicals can often pollute so new technologies and more refined or natural processes are necessary. Sometimes it is difficult to make the switch,as these products are usually more expensive and less potent, but it is something we must do to conserve the planet and reverse the damage that has been done. ■

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, a chemical products and catalysts trading company whose origins date back to the sixties, when Pemex started producing ammonia and needed catalysts. Today, in addition to catalysts, the company distributes antioxidants, flame-retardants, UV stabilizers, internal lubricants and polymers, and has a particular focus on innovation. 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. ■

Alfredo Isón

Executive President
QUÍMICA DELTA

Can you provide details regarding Química Delta's entry into the fuel business under the Exxia brand?
Química Delta entered the fuel business when the energy sector in Mexico opened up. We decided not to import products directly but instead find producers with the power to penetrate the national market. We are now suppliers of ExxonMobil for the industrial market, as well as for White Flag and Valero service stations.
In recent years there have been important changes to the fuel landscape in Mexico: the government is cancelling hundreds of permits for direct imports and the market is consolidating. Formerly when there were many companies importing there was massive tax evasion. For fuel distributors it was a challenge to compete against unfair competition. The government has now implemented the required measures to mitigate this situation, but because it is worried about losing market participation, it has also established measures that have hindered growth.
The domestic oil market in Mexico is huge: more than a million barrels every day. I think this market will eventually grow 2% or 3% every year. This is why there have been many investments at marine terminals, such as the two world-class Tuxpan ports, and Valero's terminal in Veracruz.

Why do you think the chemical distribution model suits the Mexican market, and how can Química Delta stay ahead of the competition?
Because Mexico has reduced its production of chemical and petrochemical products, distributors now have more business opportunities. For instance, the country used to produce about 200,000 ton of base oils per year, 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. Química Delta has invested in infrastructure to be able to supply many markets and also in equipment to be able to reach many clients. From 2020 to 2021 we doubled Química Delta's fleet of vehicles. ■

Luis Manuel González

Director General
LUB LINE

Can you provide an overview of Lub Line's core product lines in Mexico?
Lube Line in Mexico sells raw materials, lubricants and lubricant specialties. We have been in Mexico for 18 years and our main product lines are aimed to cover the needs of the chemical-pharmaceutical industry, the food industry, plastic specialties like those made for contact with foodstuff, and more recently, lines focused on the agriculture and automotive sectors.

Which of Lub Line products do you think offer the most growth potential?
We have two product lines getting stronger that will probably modify our organizational structure. The first one is the agriculture division where we are not only propelling existing products, but also developing new organic products to offer plant-based products that perform well and are environmentally friendly. We will use plant bases for specialized oils such as the one we have for the electrical industry, which is based on sunflower oils. We are also developing a series of organic products with the OMRI certification for use in agriculture as insecticide and acaricide. Another two product lines we expect to grow in 2022 are synthetic and specialized lubricants, which we supply in collaboration with Petro-Canada from HollyFrontier and Chevron-Phillips. We also intend to explore new markets such as the aeronautic and metal mechanical industries.

Considering the transition towards electric vehicles, how is Lub Line adjusting its portfolio accordingly?
An important part of our strategy is innovation in the solutions we offer. Lub Line currently extrudes plastics for the automotive industry. We are focused on finding which developments will be required for this growing industry and believe we can focus on laminating plastics, including those of lithium batteries. We are planning to get involved with the whole manufacturing process of batteries. ■

Othón Canales Treviño

President
QUIMI CORP INTERNACIONAL

Can you describe the evolution of Quimi Corp?
We are a company born in the world of catalysts for the refining and petrochemical industries that then entered into the distribution of chemicals and additives. Today, Quimi Corp has antioxidants, flame retardants, UV stabilizers, internal lubricants and polymers, and distributes a wide range of catalysts. We represent Clariant Catalysts and distribute for Lanxess and other American companies. For many years, Quimi Corp has represented Scientific Design Company in Mexico who designed Pemex's ethylene oxide plants, and we supply their catalysts.

How would you define Quimi Corp's innovation process?
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. We are always trying to understand our clients' needs and how to solve their problems integrally. Those needs are not found just by asking. For example, when visiting Pemex's polyethylene plants we noticed that they had a smaller plant to produce the catalyst mixing aluminum alkyls with titanate and other dangerous materials. So we offered to develop the catalyst and send it assembled. We got together with Albemarle Corporation, which we represented back then, to develop a catalyst and send it in tank trucks. Albemarle sold that business to Grace, who we still represent today. 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 that provoked variations in the production and quality of their polymer. For Quimi Corp it meant instead of selling a cheap product, we are now selling one 20 times more valuable. ■

Arturo Hoyo

Vice-President Product Line Management – North America
NEXEO PLASTICS

How can the plastics industry help stimulate better waste management and recycling practices?
Nexeo Plastics is a very active participant of ANIPAC, for which I am the president of the raw materials chapter. As an industry we have the responsibility to educate the public about best practices around waste management of plastics. The plastics sector must work with government and society to give the right information about plastics and more sustainable plastic products to help change consumer behavior, encourage better waste management and stimulate a culture of recycling.
As a distributor Nexeo Plastics represents some of the most important chemical companies around the world and all of them have some sort of sustainable solution or innovation such as chemical recycling, mechanical recycling, compostable products and bio-based products. There is no single solution and all these initiatives help. Through our customers we are active in various sustainability efforts. For example, in December 2021, Nexeo Plastics signed an agreement with two companies that are producing compostable products.

What do you think disruptions such as Covid-19 and the winter freeze in Texas have taught us about the importance of having multiple sources of raw materials in Mexico?
In some segments the pandemic had positive impacts. For example, during lockdown periods consumer behaviors changed and there was a greater demand for plastic packaging materials worldwide. In February 2021 Winter Storm Uri collapsed almost 70% of the petrochemical production capacity in North America. In combination with the pandemic, this severely impacted supply chains. Nexeo Plastics realized the importance of flexibility and the ability to rapidly adapt to changes. The company made investments to create a network that would enable us to be more agile when it comes to the importing and exporting of products. For instance, we compensated shortages caused by the storm by opening new channels and bringing in products from Southeast Asia to Mexico's Pacific coast. ■

Alonzo Autrey

Managing Director
DVA MEXICANA

It is up to us as distributors to closely follow the market's demand and situation so we can have a quick response time and help the client deliver to health centers, government institutions, etc. on time.

How have the last 12 months been for DVA Mexicana, and to what extent has the business rebounded in 2021 from the initial impact of the Covid pandemic in 2020?
In 2020 we had very difficult months from May to July. They were very complicated months because a big portion of the pharmaceutical industry depends on tenders, which were drastically reduced from previous years. The food market also had a complicated year: since people were cooking at home the consumption of processed food products was reduced. On the other hand, it was a record year for us on everything related to sanitization and disinfection. At the end of the day, for industrial and consumer specialties there were not enough materials for the market: everyone was sanitizing everything.
Currently, business has almost completely recovered. Volumes have been getting back to normal for foodstuff and pharmaceutical products since April 2021. Sanitation and disinfection demand has reduced because people's habits of extreme cleanliness are now back to normal levels. In comparison to previous years, 2020 was a positive year and 2021 will be even better.

How is the company dealing with the current global logistics and supply chain challenges?
We already expected to encounter complications and were unfortunately not wrong. Freights have increased in cost by six to eight times. Freights from Asia to Mexico that used to be US$2,000 are now around US$16,000. This generated a lot of pressure regarding pricing of the chemical products we sell to the pharmaceutical, chemical and foodstuff sectors. This adds to delivery times issues, which meant we had to increase inventories to maintain the level of service.

Can you tell about DVA's own brand products, such as your EasyCoat line?
DVA's EasyCoat line is a key area for us. To maintain the level of service on this line we leveled our inventories and, when possible, found alternate suppliers to ensure supply to clients. We have also invested on health regulation systems: we are about to be EXCiPACT certified, which is the international pharmaceutical excipients certification, which places DVA in a very strong position to offer products on a global basis. In the end, the complexity of international logistics opens opportunities for us.

What would you say are the biggest operational challenges for chemical distributors in Mexico?
I think the biggest challenge faced by clients is the response time for big changes in demand. Planning is very complex in this market. For example, 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. It is up to us as distributors to closely follow the market's demand and situation so we can have a quick response time and help the client deliver to health centers, government institutions, etc. on time.

Which pharmaceutical products do you see as having best potential for growth in the coming years?
Speaking of drugs, each therapeutical line has its own history. In countries like Mexico, everything related to chronic degenerative illnesses will be a priority for laboratories focused on generic products. Likewise, the emphasis on preventive and attention measures for breast cancer is always growing, as well as alternative therapies. The demand for these products means there is an opportunity to have generic treatments available at lower prices for patients.
DVA focuses on customer service from beginning to end so we can offer a complete formulation of solid, semisolid and liquid oral drugs. We have a laboratory in Mexico and agreements with companies dedicated to drug development that help to deliver the fastest way possible for the development of a drug.

Where would you like to see the company by the end of 2022, and what is your longer-term vision?
Derived from the EXCiPACT certification we are in the process of attaining, DVA has managed to export more coatings from our plant in Mexico. In 2022 we would like to have a more internationally consolidated business with higher penetration in markets beyond Mexico.
We are focused on continuing innovation and investing an important amount of resources in this area. As of now, we are in the process of obtaining a patent for coatings as part of our research process to help clients get better solutions for the drugs they offer. DVA offers quality innovative products and technology accessible to all clients to help them solve the challenges they are facing. ■

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.

Ricardo Méndez Pastrana

Director General
PROMAPLAST

PromaPlast celebrated its 25th anniversary in 2021. How was this landmark year for the company?
Business has been extremely good for PromaPlast over the past months, and 2021 has been a great success, with a lot of tailwind from 2020. Although demand has been incredible and we are in a seller's market, there have been many challenges such as scarcity of materials and logistics deficits that have impacted prices and therefore the possibility of doing business. Downstream for our customers this market has not been easy as they have been impacted by price increases which they have had difficulties passing on to their supply chains.

A high percentage of all PromaPlast's sales go into the footwear and automotive sectors. To what extent have these industries rebounded in 2021, and which industries have shown strong demand?
Both the footwear and automotive industries have rebounded, but have not yet recovered to pre-pandemic levels yet. The Mexican Automotive Industry Association (AMIA) recently published figures that showed vehicle sales and production in Mexico for September 2021 were down against sales and manufacturing figures of August 2021 and September 2020, demonstrating that the automotive industry is still struggling, partly due to a lack of raw materials such as semiconductors. On the other hand we have seen great demand coming from the packaging industry, for which PromaPlast has a wide assortment of solutions that are very popular. We have also broadened our focus in compounding areas and we are starting to focus more on wire and cable. All these diversification efforts have brought positive results, which will be boosted further when the automotive and footwear industries are back in shape.

What would you say are Mexico's main advantages for chemical companies?
Compared to the rest of the world, Mexico's population is still very young and the internal market continues to grow. We have not been able to take the market to the potential it could and should have, but despite everything, the internal market continues to offer business opportunities. Mexico's geographical location is an advantag, and the country is a great platform to supply to the ever-growing US markets. There are many things that still can be done to make Mexico more reliable and attractive for investment, and sometimes political rhetoric does not help this. It is notable, however, that the government has respected every free trade agreement.

Why do you think there are many chemical distributors in the Mexican market?
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. In order to serve these small companies you need a number of small distributors. Distribution also continues to be a very important channel for large producers serving the Mexican market. To stay ahead of competition PromaPlast focuses on being close to customers and meeting their requirements. We play a key role in relaying market demand and needs to producers.

How have you seen the topic of sustainability grow in relevance in recent years, and how has this influenced PromaPlast's product portfolio?
In recent years, we have seen significant pressure from society in general against plastics, despite increased demand. Sustainability is a focus for PromaPlast and by listening to market demands we have reinforced our portfolio of solutions to be biodegradable, which facilitate the recycling possibilities of our customers.
Mexico's National Association of the Plastics Industries (ANIPAC) has made great advances in moving the plastics industry in Mexico towards becoming a circular economic sector. The Association has also done a tremendous job in educating the market through media presence and is making it visible that the plastics industry has a focus on sustainability and preserving our planet for generations to come.

PromaPlast has ambitious targets in the next three years. What is the company's strategy for achieving these and where do you see the best avenues for growth?
PromaPlast will continue to grow its existing product lines organically as there is still a significant amount of cross-functional product growth that we can exploit. There is still potential for geographical growth in Mexico and we also want to expand our presence within the US. The company would also like to expand its specialties product portfolio, which will assist us in meeting targets due to interesting margins in this area. ■

LOGISTICS & SERVICES

"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."

- Martin Sack,
Regional Head – Americas,
Leschaco

Image courtesy of Vopak

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

#31 Marine terminals

#90 Berths

2.6M cbm Storage capacity

#45 Tanks

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 vessel 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."

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.

Physical and 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 putting 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. ■

AP

JF

Alvaro Pérez & Jorge Flores

AP: Managing Director
JF: Commercial & Business Development Manager
VOPAK MEXICO

Can you provide an overview of Vopak's presence in Mexico?
AP: We are located on the Atlantic side of Mexico with three terminals: one in Veracruz with approximately 213,000 cubic meters (cbm) of installation, one in Coatzacoalcos with 26,000 cbm and one in Altamira with 110,000 cbm. At our Altamira terminal we are in the final stages of a project that will expand the site to 150,000 cbm next year. The services that we provide in these terminals are varied and include storage, the receiving of vessels and temperature control.
JF: Our petrochemical portfolio comprises roughly 40-45% of our business in Mexico. Regarding the value chain, we have a lot of interaction with distributors here in Mexico as well as certain customers such as BASF, Petrocel, Unigel and Braskem, among others. Our operations provide wide access to different chemical clusters in Mexico thanks to the locations of our terminals.

What are your views on the current logistics bottlenecks?
AP: The pandemic was an eye-opener for the industry as certain inefficiencies within the value chain became more apparent. To solve this it is critical first to find the bottlenecks in your 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.
JF: We are working on solving how to unload vessels more efficiently. A major cost for our customers is demurrage — every day that a vessel awaits arrival to the jetty costs around US$20,000-US$25,000. When we build a new project this is something we look into closely.
Additionally, we see a bottleneck in the amount of time that trucks sometimes wait in a terminal. Vopak is working on a slot booking system that, along with increased digitalization, will allow our customers to set up an appointment for a particular date, streamlining arrivals. ■

> **Leschaco will be focusing on new vertical markets, increasing its product footprint, and investing heavily in people and technology.**

Martin Sack

Regional Head – Americas
LESCHACO

2021 was a year defined by global logistics challenges. Have you seen any signs that the situation will improve in 2022?
We expect logistics disruptions to remain a challenge for at least the first half of 2022, maybe even getting worse due to the spread of the Omicron variant across the globe. We have some expectations that the general environment might improve towards the second half of the year, but there remains a significant amount of uncertainty and we are prepared for another complex and difficult year.
When it comes to the impacts of the ongoing pandemic, Leschaco is well prepared to cover all its business and operations at the highest level. We are fortunate that we can work from home or in hybrid models due to adjusted processes, reliable visibility tools and our highly motivated and committed employees. What concerns us more are the essential and critical services of carriers, port terminals and trucking companies.

To what extent do you think the pandemic has highlighted the importance of specialist logistics services?
The relationship and collaboration between business partners has become even more important during the pandemic. You can´t go through this difficult environment on your own. Our business model was always built on trustful and personalized cooperation with our customers and business partners. Complex issues also require the highest level of expertise and specialized industry knowledge to reach the expected results. We have also seen a significant amount of new business coming in during the pandemic, as companies put more attention on qualified and reliable assistance.

If strengthening regional supply chains become a focus in lieu of global disruptions, what steps or investments would need to be made by companies and governments?
Strengthening regional supply chains is an ongoing and complex topic. Mexico, for example, has significant advantages when it comes to its geographical location. It also benefits from numerous international trade agreements. However, regretfully, the overall investment into logistics and additional infrastructure from both the government and private sector is not enough to take advantage of this opportunity. In other countries of the region, the situation is quite similar. For the Leschaco Group, the Latin American market remains strategically important. Effective February 2022, we will expand our footprint by opening a new organization in Peru.

How do you evaluate Mexico as a place to operate?
For Leschaco, Mexico has been an excellent market to grow its business, even throughout the pandemic. We have been able to achieve continuous growth due to a diverse product portfolio, customized services and the pure size of the market. With the recovery of the economy in 2021, we experienced an even bigger than expected increase in volumes. Mexico has a lot of advantages, especially due the country's connection to the booming US market. We expect these opportunities to continue moving forward, where Leschaco will be focusing on new vertical markets, increasing its product footprint, and investing heavily in people and technology.

What role can the logistics sector play when it comes to helping supply chains reduce their environmental impact?
Global transportation has a significant impact on Co2 emissions. Vendor management, focused on reduced emissions, becomes every day more important. We need to choose the best partners that have a more positive impact in terms of sustainability. Our customers already have access to a door-to-door emission calculator. Consultancy and communication are important and together with customers we should discuss and review opportunities to reduce long distance transportation and improve overall logistics. Near-shoring, related to the current supply chain disruption, might also become another important factor to reduce the transport related emissions.

What do you see as the main themes that will influence the logistics industry in the coming years?
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. The complex logistics sector requires highly specialized people, and as staffing becomes more difficult around the world, we need to find new ways of attracting and retaining talent. ■

With higher ocean freight costs, companies are looking to save on costs elsewhere. Flexitanks are the most economical system out there for loading non-haz bulk liquids.

Santiago Carús

Managing Director
EUROMEX LOGISTICS

Can you provide details of Euromex's services for the chemical sector, including flexitanks and iso-tanks?
Euromex is part of a customs agency with a history of more than 100 years dispatching goods in Mexico. We are in the main Mexican ports with our own offices. In addition to customs clearance, we have specialized transports; we are currently the leader in Mexico in flexitanks, which consist of a polyethylene bag inside a 20 ft container that can load 24,000 lts of non-haz liquids. Furthermore, we represent about seven Asian and European isotank operators, which allows us to transport hazardous chemicals imported from Asia and Europe. We also have tanks available for the export of hazardous chemicals. More than anything else, I would say the most important thing Euromex has is its people and the service we give to customers. We are committed to punctuality, security and making their life easier.

How can Euromex help clients mitigate the current global logistics bottlenecks?
In terms of containers, we made alliances with carriers. If, for example, I need to load two containers in Guadalajara but there are none at the city, a carrier that is in Altamira port will bring only one container available from there and on its way to Guadalajara will stop to another location such as San Luis Potosí to pick the other container. This way we stay on the same route, do not raise costs and comply with the customer.
As for flexitank containers, from the beginning Euromex always bought type A containers. Today, the shipping companies usually 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. There is no worse cost than to stop exporting, so creativity is necessary to adapt.

The global flexitank market is expected to grow at a compound annual growth rate of 18.9% from 2020 to 2027. What are the reasons behind this?
The phenomenon of flexitanks has been growing every year since mass use of these products began in 2000. With higher ocean freight costs, companies are looking to save on costs elsewhere. Flexitanks are the most economical system out there for loading non-haz bulk liquids. That is why many companies are changing from using drums or 1000 IBC units to flexitanks. This is being done even for small volumes because the savings are between US$1,500 to US$2,000 per container. Flexitanks are relatively new, so there is still plenty of opportunity for this market to grow in the coming years.
Euromex exports a Ready to Drink Spirit from Tequila, Jalisco to the United States. Previously, this product was piped over 3,000 km from Tequila, Jalisco, to Los Angeles, but now it goes by sea in flexitanks. This is thanks to that reduced cost: instead of five pipes per month, we are sending 20 flexitanks. Many companies are also switching from isotanks to flexitanks for non-hazardous liquids such as glycerin and lubricating oils. Flexitanks comply with all the certifications, such as FDA and kosher, so now you have a lot of food grade products and water transported this way.

How has safety in the Mexican logistics sector improved in recent years?
One of the challenges in Latin American countries like Mexico is security in terms of robbery and accidents. Both have declined greatly in recent years as companies have pushed security programs such as CTPAT (Customs Trade Partnership Against Terrorism) and OEA (Operador Económico Autorizado) in Mexico. You must have these certifications if you want to run a triple A company.
On the technology side, there are now companies that have cameras inside their trucks to see in real time what the operator is doing and at what speed they are driving, as well as 360 degree cameras that can see who is coming behind and in front of the truck. Now with the push of a button the driver can stop the truck and nobody can move it, or from the monitoring center they can see that there is a suspicious car behind or in front of the truck and warn the operator and stop the engine until that situation is over. This has greatly reduced incidents of robbery and accidents. ■

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 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.

We have recently seen a significant increase in customers asking for 2K technology, which are machines that have double injection units with the capability to inject two materials or colors at the same time.

– José Antonio Barroso, Deputy General Manager, Haitian Mexico

Image courtesy of Euromex Flexitank

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.

de Montfort stated that Mexico is one of Air Liquide's main growth markets this decade, and outlined his vision for the years ahead, which starts with consolidation: "This summer (2021), we had the inauguration of a cutting-hedge helium plant in Apodaca, NL; this event came to complete an investment of over US$300 million in the last 10 years, with some operations now present in five States."

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… Through using macro optimization of existing control systems, reduction in costs, increased production and increased reliability is possible."

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.

On the topic of which technologies have been in high demand for plastic injection, he said: "We have recently seen a significant increase in customers asking for 2K technology, which are machines that have double injection units with the capability to inject two materials or colors at the same time."

Technology that enhances the sustainability of an operation is another area that has grown considerably in recent years with the exponential rise of a global green agenda. Multinational company 3M looks to reduce the environmental impact of its own operations and those of its clients, according to director general of 3M Mexico, Fernanda Guarro. Discussing the company's Science Applied to Climate Change initiative, she gave the example of 3M's Glass Bubbles product, which are chemically-stable microspheres used to mix and make a product lighter. "They are used to reduce weight in airships and cars, therefore improving the use of fuel and battery life. In this sense, this product makes a direct impact to reduce carbon footprint."

Guarro was keen to emphasize how innovative products drive organic growth while helping to maintain margin and costs. 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. ■

Gerardo Berea Montes

Special Gases Director
GRUPO INFRA

> We see significant potential for Mexico to increase its overall supply to the US market, which has historically relied heavily on products from Asia.

Can you introduce Grupo Infra's special gases (spec gases) business unit and product portfolio?

What is particularly interesting about Grupo Infra's spec gas offerings is that we are constantly introducing new products to the market. We developed half of our currently available product lines within the past 10 years. Within Grupo Infra's spec gas segment high purity gases account for around 30% of our sales. Next comes our line of welding gases and mixtures. Though a less common addition to a company's spec gas unit, these products generate around 25% of our sales. In addition to these we also offer calibration gases, food and beverage grade gases, laser cutting gases, liquid helium, medical (no oxygen) gases & mixtures, aerospace grade gases, and traded chemicals.

What would you say have been the biggest challenges this year?

It has definitely been a challenging year for several industries, both worldwide and in Mexico. As you know the automotive industry has been hit by a global microchip shortage. The shrinking of this industry directly caused a decrease in sales. Decreased demand for welding gases has resulted from the weak performance of the construction sector in Mexico. Lastly, our aerospace line is without question our poorest performing division at the moment, since this industry was deeply affected by the pandemic, though we anticipate this to recover next year.

Which of the industries you supply gases to have performed best in 2021?

In terms of sectors that are doing well, I will start with the CO2 we produce that is used for beverages. After this market shrank in 2020 with restaurants and bars closing due to the pandemic we have seen a considerable recovery in 2021. Similarly, Grupo Infra's gases that extend the shelf life of food are doing extremely well as we experienced a shift in the food consumption behavior during and after COVID-19. This drags out the supply chain, broadening the scale of the market for a particular type of packaging known as Modified Atmosphere Packaging (MAP) that consist of a blend of gases introduced into the packaging environment which increases the shelf life of a variety of products.

The use of laser cutting gases has also grown due to the demand for local production of metal parts after the increasing costs of freights coming from Asia. And finally, I would say that the demand of gases used for sterilization was boosted during COVID-19 and will keep performing well in the next couple of years.

What role do special gases play in the supply of medical gases, and how has this demand evolved from 2020 to 2021?

Special gases are very important for the medical industry because if you want to produce a particular medical device or drug you have to use medical-grade gases. We have seen an increase in demand for medical gases since 2020, with oxygen being the most dramatic. Demand for medical oxygen has grown in waves that correspond with Covid-19 infection rates, and we expect this to continue into 2022 as there is increased need for this gas both in hospitals and for domestic use.

What is your outlook for the gas market in the coming years?

I see a few different trends unfolding in the gas market. Welding gases will present an avenue for growth in Mexico given the number of infrastructure projects that require this type of product. Additionally, high purity gases will continue to be important for the automotive industry. The demand for medical gases will not disappear, nor will the need for CO2 and MAP gases in the food industry. I also 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.

As imports from Asia have become more expensive, what potential do you see to increase production in Mexico to meet demand throughout the Americas?

We see significant potential for Mexico to increase its overall supply to the US market, which has historically relied heavily on products from Asia. Especially as a company that manufactures welding products, Grupo Infra has evolved into a very competitive alternative for US buyers. As a gas manufacturer, we also see the opportunity to supply various manufacturing companies with the materials necessary for their production processes. ■

Our new investments guarantee the supply of products to the Mexican market and reduce the need for importation from other countries.

Dieter Femfert

Commercial Director
CRYOINFRA

How would you evaluate Cryoinfra's performance in 2021 in comparison to the previous two years?
2021 has been an extremely busy year. Oxygen is a key element for the treatment of Covid-19 patients and during the second and third waves the demand for oxygen increased dramatically. Cryoinfra has been working extremely hard to supply to hospitals and home patients in Mexico and it has been a priority for both us and the government to ensure that there is enough oxygen supply. To date, Mexico has been able to keep up with demand and there has been no hospital without oxygen. We had to increase trucks and production facilities, hire more operators and work 24 hours a day to ensure that demands are supplied.
On the industrial side, Cryoinfra's customers in the petrochemicals, steel, mining, aerospace, automotive, electronics and construction sectors started to increase production in 2021 and demand for products such as nitrogen, argon and hydrogen started to rise.

Considering the heavy demand for medical gases and the rejuvenated demand for industrial gases, how is the company managing to increase production to supply demand?
Grupo Infra has invested in new facilities in 2021 to keep up with increased demands. 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. With our new investments we are sure to have more production capacity to ensure consistent supply.
All of Grupo Infra's operations are integrated and our plants work together. In the industrial gas segment streamlined logistics to guarantee the supply of our products is extremely important. Cryoinfra mitigates logistics challenges by having more than 35 production facilities throughout the country so we can be close to customers regardless of their geographical location.

Can you explain how Cryoinfra is working to reduce its CO2 emissions?
Collectively we need to ensure the conditions to live in a healthy environment. Sustainability and emission reduction are important to Cryoinfra and form part of our vision, culture and objectives. We aim to be as environmentally friendly as possible and always strive to reduce our CO2 emissions, not only for us as a company, but also to help our customers achieve their sustainability targets.
In October 2021, Grupo Infra inaugurated its first national gas station for vehicles in an effort to reduce emissions through the use of natural gas instead of gasoline or diesel. We are also working on several hydrogen projects as we want to start producing green hydrogen to replace combustibles such as fuel oil. Cryoinfra is always trying to improve the technologies in our plants and the way we supply products to our customers. We are working closely with our customers to find ways in which we can collectively reduce our carbon footprints.

To what extent do you think potential changes to the constitution and energy supply could impact competitiveness for Mexican companies?
Constitutional changes are a big concern for us and we believe that the ramifications of proposed changes could negatively impact all industries in Mexico. We have to remember that Mexico is competing with countries worldwide. To be competitive we need to ensure the supply of electricity, natural gas, raw materials such as ethane, ethylene oxide, ammonia, polyethylene, and various petrochemicals are available at the lowest cost possible.
It is important that companies such as Pemex and CFE are as strong as possible, however, they cannot work alone and need to collaborate with the private sector towards the benefit of Mexico. Successful industrial development cannot be achieved without collaboration.

What are Cryoinfra's outlook, vision and priorities for the coming years in Mexico?
We are fortunate that Grupo Infra's stakeholders believe in Mexico and want to invest in the country. The company has been in the market for over 100 years and we believe that we will see continuous growth in the years to come. Our new investments guarantee the supply of products to the Mexican market and reduce the need for importation from other countries. We will continue to grow closer to our customers, finding ways to reduce costs, improve quality and become more sustainable. ■

Sustainability in the Service Sector

"I am actually strongly convinced that the only way for gas producers to increase their supply is by lowering our environmental impact. This involves a mix of short term and long term solutions. In the short-term, we aim to be a role model for sustainability through optimizing delivery and increasing daily efficiencies: our supply chain has to do more with less impact on our environment. Also, we want to continue to promote purchase agreements based on renewable energy for our operations. This is in line with the actions taken recently. Then, in the long-term, Air Liquide is focused on finding innovative solutions to replace the use of natural gas with hydrogen for our customers. We have several successes in the world which we want to replicate in Mexico."

– Raphael de Montfort,
Managing Director – Mexico, Air Liquide

"The advantage of natural gas as a fuel is that it is less expensive than other fuels and also more environmentally friendly. Natural gas has lower CO2 and lower greenhouse gas emissions than diesel and propane fuels. It is also versatile as it can either be sourced from traditional oil and gas wells or from renewable sources such as natural waste from dairy farms. There is a great push, especially in the US, for creating the infrastructure for renewable natural gas. Some states have been trying to implement a carbon tax which is a step in the right direction to incentivize companies to switch to a lower emission fuel. We also need to educate the market on the benefits of natural gas solutions. We need to get the word out that the technology is there and has been proven to have both cost and environmental benefits."

– Caio Zapata,
CEO, ÉNESTAS

"An example of 3M's science applied to climate change is our Glass Bubbles product, which are chemically-stable microspheres used to mix and make a product lighter. For example, they are used to reduce weight in airships and cars, therefore improving the use of fuel and battery life. In this sense, this product makes a direct impact to reduce carbon footprint.
Concerning the circular economy, 3M reuses resources and minimizes consumption. We aim to reduce our manufacturing waste by 10%, reduce our dependance on fossil plastics by 125 million pounds, and achieve zero residues in more than 30% of our manufacturing sites by 2025. An example is 3M's Scotch-Brite fiber, which is integrated by several elements. The green layer, used to scrub the dishes, is now made of 100% recyclable material. This is important because 3M's Scotch Crite fiber is a market leader found in the majority of homes and kitchens."

– Fernanda Guarro,
Director General – Mexico, 3M

"Sustainability forms part of Vokogawa's mission and we are looking to contribute to a greener world. The company tries to ensure that its internal processes are as efficient and sustainable as possible, but we also focus on making external contributions with our sustainable solutions and technologies. While we believe that the oil and gas industry will remain relevant for many years to come, we acknowledge that other verticals such as renewables are growing areas of focus.
With this in mind, Vokogawa has been developing solutions surrounding clean hydrogen, emission reduction, and energy savings in an effort to move towards a more sustainable future."

– Gabriel Sánchez,
Director General – Mexico, Vokogawa

CONCLUDING THOUGHTS

"Chemicals are not otherworldly; we just need to understand and use them correctly. To paraphrase Paracelsus, the father of toxicology: "The difference between medicine and poison is in the dose"; sustainability will come from the adequate management of chemical and biological solutions"

– Fernando Vera Hernández,
Director General,
Grupo Versa

Image courtesy of christopheducoin in Pixabay

During our research, we speak to business leaders across the value chain to gain a qualitative understanding of the state of the chemical and petrochemical industries based on their experiences. Through what amounts to several hundreds of conversations, we compile a database of valuable knowledge on a range of important topics. In these pages, we have chosen a brief selection of quotations that we feel best summarize some of the challenges the chemical business community should expect to encounter going forward.

"I think we are at a very critical moment in Mexico because we are seeing that some laws are changing drastically without giving continuity to established legislation, such as concerning energy. Mexico has many advantages from an investment standpoint, such as the country's geographical position and talent base. However, the country must work to remain competitive from a cost perspective."

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

"It is important to have a strong Pemex, CFE and CENAGAS, because the petrochemical sector in Mexico was created based on feedstock from these national companies. There is an ongoing discussion to involve the private sector in the development of feedstock supply and we hope to have an improvement in the dialogue surrounding this to find a better long-term solution."

- Stefan Lepecki,
CEO,
Braskem Idesa

"In the future, if feedstock challenges are sustained we might see the overall profile of the Mexican chemical industry change to be less strong in petrochemicals and more focused on specialties and other products that are less dependent on the availability of feedstock."

- Adam Rothman,
Managing Director & Partner,
Head of Chemicals and Process Industries – North America,
Boston Consulting Group (BCG)

"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."

- Adrian Duhalt,
Post-doctorate fellow – Mexican energy studies,
Baker Institute

"Today, Mexico is the ninth most favored destination for FDI in the world, whereas we were not in the top 10 before the pandemic. 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."

- Martín Toscano,
President,
Evonik Industries Mexico

"Thanks to GMO corn and soy production is growing, as with many more grains. Changes in the world come from real scientific studies, not from false ecologic expectations. This must be celebrated and promoted as we need to provide confidence to traders and consumers... I believe true ecology is finding an environment that allows you to keep growing, not going back to the past."

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

"Even though petrochemical companies are often at the avant-garde of operational technology, I believe there is a lot of room for improvement and investments in digitalization throughout the chemical supply chain, to become more efficient. Greater efficiency will allow companies to cut emissions and meet sustainability targets in the future."

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

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