THE IMPORTANCE OF RELIABLE CLEAN ENERGY AND INFRASTRUCTURE FOR MEXICO

TO REALIZE ITS POTENTIAL FOR NORTH AMERICAN "NEARSHORING"

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Executive Summary

Mexican manufacturing has been growing due to numerous "nearshoring" benefits to U.S. supply chains. Yet that growth is limited by several factors that this paper explores, focusing on the specific challenges and potential energy-related solutions that will help determine just how successful nearshoring in Mexico ultimately becomes. To enhance our research and opinions we conducted a survey of executives from companies with global footprints that operate in Mexico.

Nearshoring is here, no longer just a possibility, but starting to have a tangible impact. Though many U.S. manufacturers have shifted operations from China to other countries in Southeast Asia (Malaysia, Indonesia, Vietnam) to remain close to existing supply chains, nearshoring, from a U.S. context, can most logically be defined as Mexico and Canada. Both countries collectively account for **20%** of U.S. imports globally.

Further regionalizing North America's supply chains through nearshoring helps to reduce dependence on far-flung trade routes, minimizes delays, and achieves greater certainty and control over supply and manufacturing. In the case of Mexico, lower labor costs are also available when compared to the U.S. and Canada. That said, Mexico faces another set of challenges as a nearshoring destination given its shortages in reliable and clean energy, infrastructure (roads, ports, water), qualified workforce, and ongoing security concerns.

In the Mexico context, electricity has proven to be a particularly complicated challenge given the current state of electricity infrastructure, supply-demand dynamics, and the government policies currently being pursued. As such, it may not only be an additional cost, but a potential deal-breaker for potential nearshoring companies. Unless Mexico's next president moves to expand the availability of reliable and clean energy alternatives and pro-actively responds to other mentioned challenges, the country runs the risk of not realizing its nearshoring potential.

This paper offers opinions on how to address the limitations, informed in part by a six-question survey of 32 executives from companies with global footprints that operate in Mexico.[1]

[1]Our sincere appreciation to AmCham Mexico City and the Consortium of Global Companies for their support in disseminating our survey to their member executives.

Background

Global supply chains are highly complex today. They frequently source multiple components from a wide array of places around the world based primarily on cost and reliability of supply. One of the key questions for U.S. reshoring and nearshoring is just how much control of the supply chain can be secured, and at what cost?

In this context, it is important to recognize that nearshoring at present is frequently not proving to be cheaper **–at least for now–** than friendshoring[2] alternatives depending on supply chain specifics and trade dynamics. Such potentially higher costs are being offset by the benefits of proximity and better control over supply chain issues. The IRA and CHIPS Act are helping to offset some of those additional costs to fortify existing supply chains and hopefully establish new ones. While incentives under the CHIPS Act and the IRA aim to bring manufacturing to the U.S. in semiconductors and clean technology, one exception in electric vehicles, where more integration among the U.S., Mexico and Canada is encouraged. Overall, the nearshoring premise is that over time, more robust local or regional supply chains will be developed, and such incentives will no longer be needed.

At the same time, even though China has lost its title as largest exporter of goods to the United States in the first half of 2023, according to U.S. Census data **(outpaced by Mexico -#1, and Canada -#2),** dependence on China may not yet be subsiding or at least not at the levels widely believed. There is increasing recognition that China has a dominant position in certain supply chain segments, is highly efficient, and will not be easy to supplant even as its labor costs have risen. Moreover, some friendshoring has been little more than the equivalent of greenwashing in which primary sourcing remains in China but is then shipped to a friendshoring country where little or no value is added but stamped as originating from the nearshoring country.[3]

Nonetheless, some decoupling between the two largest economies in the world is underway, but will take time, perseverance, and dedicated efforts to achieve its overarching goals provided geopolitics continue down the same path. Enter nearshoring, which on paper reduces reliance on distant and potentially vulnerable supply chains (either due to logistics or politics), and provides a more secure, flexible, and economically and geopolitically appealing sourcing strategy. Cultural familiarity and same time zones are added benefits. Mexico and Canada are in a privileged position to take advantage of nearshoring, especially where established supply chains already exist. The real benchmark for nearshoring success will be North America's ability to not just expand established supply chains, but to attract and create new supply chains in areas such as semiconductors and other industries that are currently highly dependent on supply chains they have less control and influence over.

[2]'Friendshoring' is a growing trade practice where supply chain networks are focused on countries regarded as political and economic allies.

[3]Caroline Freund, Aaditya Mattoo, Alen Mulabdic, and Michele Ruta, Is US Trade Policy Reshaping Global Supply Chains?, May, 2023

Established Supply Chains in Mexico and New Ones

Mexico-U.S. trade has grown dramatically since the signing of the North American Free Trade Agreement (NAFTA) in 1993. Since then, U.S. exports to Mexico have risen 565%, while Mexican exports to the United States have grown **864%.** This translates into roughly **19,200 truck crossings per day** currently, based on U.S. Trade Numbers and U.S. Bureau of Transportation Statistics. While roughly **30%** of Mexico's exports to the U.S. are auto-related, another roughly **16%** are electronics, **4%** are oil, **4%** are produce, and **2.1%** are alcoholic beverages.

While established supply chain sectors in Mexico include automotive, chemicals, aerospace, electronics, and medical supply/ pharmaceuticals, the automotive and electronics sectors present the most immediate nearshoring growth opportunities.

The automotive sector is far and away the most established and integrated industry that has moved far from just assembly. Mexico was the 7th largest car manufacturer in the world in 2021 with production of **3.15 million vehicles**, even though it does not have its own major national car manufacturer. But Mexico's global ranking has a strong chance of rising given IRA incentives for batteries in electric vehicles and increased content requirements for autos that must come from within the region to qualify for tariff-free trade. Just last year, Mexico joined the U.S. in setting a target of **50%** production of zero-emission vehicles by 2030.

Mexico was the second largest exporter of electronics to the U.S. in 2020 and the sixth largest producer in the world. It is the largest manufacturer of flat screen televisions. With different regions involved in distinct areas of computer and electronics activities, as one example, Guadalajara is on target to become the software center in Mexico. Mexico's electronics sector includes computing and office electronics, audio and visual, as well as precision measurement and control, navigation, and optical instruments. It also includes semiconductors, which are set to be a significant growth area given the U.S. CHIPS Act incentives and focus. The U.S. and Mexico formed a Supply Chain Working Group in 2022, with its primary emphasis on the semiconductor and information and communications technology (ICT) supply chain networks between the two nations.[4]

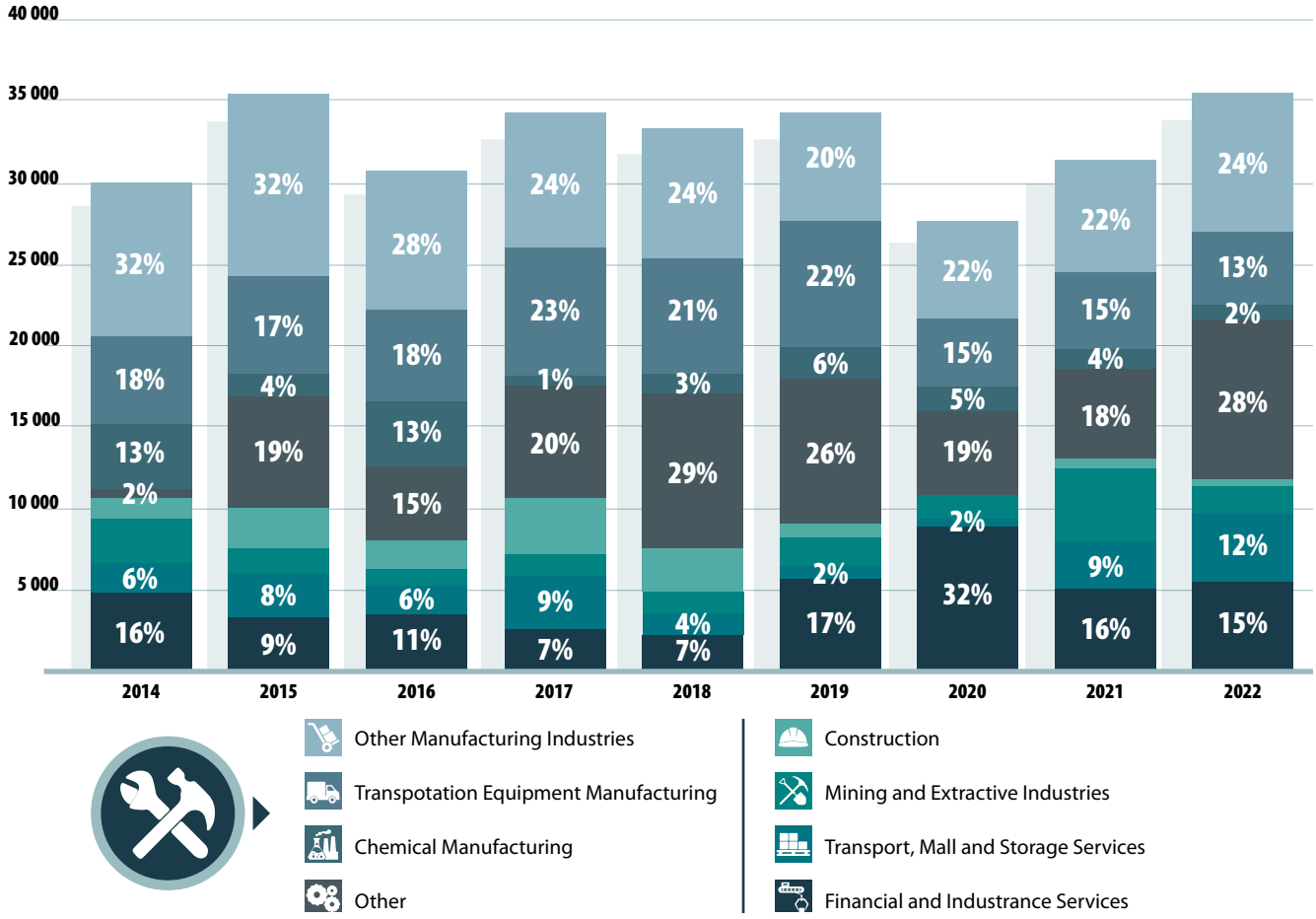
A look at foreign direct investment (FDI) by sector (See Figure 1) makes clear that manufacturing (in blue) remains a fundamental area for investment even as Mexico continues to diversify its foreign investment base. It also has the greatest potential to grow significantly from nearshoring, particularly if government policies become more favorable to foreign investment.

Two other growing areas are likely to directly or indirectly benefit from nearshoring activity:

- **financial and insurance services, and**
- **transport, mail and storage services.**

[4] https://www.whitehouse.gov/briefing-room/statements-releases/2022/09/12/fact-sheet-2022-u-s-mexico-high-level-economic-dialogue/

FIGURE 1. TOTAL MEXICO FDI BY INDUSTRY, 2015 – 2022 (MM USD)[5]



FDI jumped by **48%** during the first quarter of 2023, reaching **US$ 18.6 billion,** compared to the same period in 2022. The manufacturing sector attracted **53%** of all FDI, more than double the levels from a year ago.

In terms of FDI by country, the U.S. dominates in the manufacturing sector, with more than half of the total in 2022 and the highest share in the last 15 years. Such data reflects some of the nearshoring effects in Mexico.[6]

[5]Data from Secretaria de Economia, Inversión Extranjera Directa en México por país de origen y tipo de inversión. (millones de dólares)

[6] idem

Incentives

A litany of U.S. trade-related incentives and deterrents have been introduced under President Biden. This includes the CHIPS and Science Act (CHIPS Act), the Inflation Reduction Act (IRA), the Bipartisan Infrastructure Law, the Supply Chain Resilience Initiative, and the Biden Administration's policy initiatives toward China on technology issues. The most tangible benefit for Mexico thus far has been the ability to take advantage of the IRA incentive that provides a **US$ 7,500 credit on electric vehicles** sales where battery materials are sourced from the U.S. and its approved trading partners, like Mexico. The U.S. government is encouraging more integration between the United States, Mexico, and Canada on this front, while providing incentives to manufacture semiconductors and clean technologies in the U.S.[7]

There are also major bilateral initiatives underway to improve cross-border efficiency and robustness of trade flows and employment. With **US$ 863.4 billion** in U.S.-Mexico trade in 2022, this translates to close to nearly US$ 100 million of cross-border trade every hour. Eliminating bottlenecks while maintaining high levels of security is high on the agenda of both countries. A 10-minute delay at the border is estimated to equal a **US$ 312 million loss,** according to Georgina Barquet of Mexico's Embassy in Washington, DC. She further states that reducing border delays would create **18,000 direct and indirect jobs** in Mexico. Mexico's US$ 1.5 billion pledge to strengthen border infrastructure is promising.

Other planned improvements include:

- **Smart border technologies to reduce border waiting times, including x-ray scanning of vehicles.**
- **Expansion of bridges, many of which have been delayed due to environmental impact assessments (EIAs) that need to be streamlined.**
- **Work visas, an initiative being spearheaded by Rep. Tony Gonzalez from Texas**

Over time, these initiatives should yield positive results for reducing supply chain bottlenecks along the U.S.-Mexico border.

[7]John McNeece, President Biden's Industrial Policy and Prospects for North American Regionalization, October 2023

How Mexico Stacks Up on the Cost Side

Mexico does not necessarily represent the cheapest manufacturing alternative for North American-focused end users. Incentives and closer cooperation over time may change that reality. Some of the factors working against Mexico include the strong Mexican peso (over the past year), rising labor costs, security-related issues, regulatory delays, and the cost of energy. Before undertaking a SWOT analysis of such costs, we detail a few key considerations to place in perspective.

The Mexican peso has appreciated **10%** against the USD over the past 12 months, which has had a negative impact on Mexico's global competitiveness. Long overdue increases in minimum wages have lowered the competitiveness of labor. Minimum wages more than doubled from 2019 to 2023, going from 5 to 11 USD/day (102 to 207 pesos per day). AMLO also instituted higher daily wage rates along the border, aiming to improve local economies and dissuade would-be migrants from leaving the country.

Mexican salaries are still well-below their U.S. equivalents, which in 2023, were just 1/4 of U.S. salaries. Nonetheless, it is important to recognize that as automation and AI use increase, wages are becoming a smaller share of overall manufacturing costs in certain sectors.

In addition to wages, qualifications are relevant and according to a recent joint study undertaken by Coparmex and IMCO, **75%** of Mexican businesses struggle to find qualified workers.

Mexico's Electricity Supply Challenges

Many industries and processes are becoming more energy-intensive with varying degrees of automation. Reliable and affordable electricity supply is essential for manufacturing facilities, data centers, offices, and communication networks that are the heart of the nearshoring model. An inability to secure reliable electricity can have devastating consequences for manufacturing. Electricity supply not only ensures uninterrupted production and operations, but it is also central for real-time communication and data exchanges. Moreover, decarbonization goals and Net-Zero commitments in the face of climate change demand that international companies reduce emissions, procure cleaner energy, and deploy sustainability measures across their value chains. Ford Motor Company, for example, has set carbon neutrality by 2050 as a key aspect of its investment framework which directly pertains to its operations in Mexico. According to data from the company, it is **"investing more than 50 billion dollars until 2026 to accelerate our zero-emission vehicle production plan and create an ultra-efficient manufacturing system to help us achieve our goal of carbon neutrality by 2050."**[8] Boston Scientific, a major investor in the medical and life science space with operations in Mexico, has an even more aggressive goal of carbon neutrality by 2030 in all manufacturing and key distribution sites.[9]

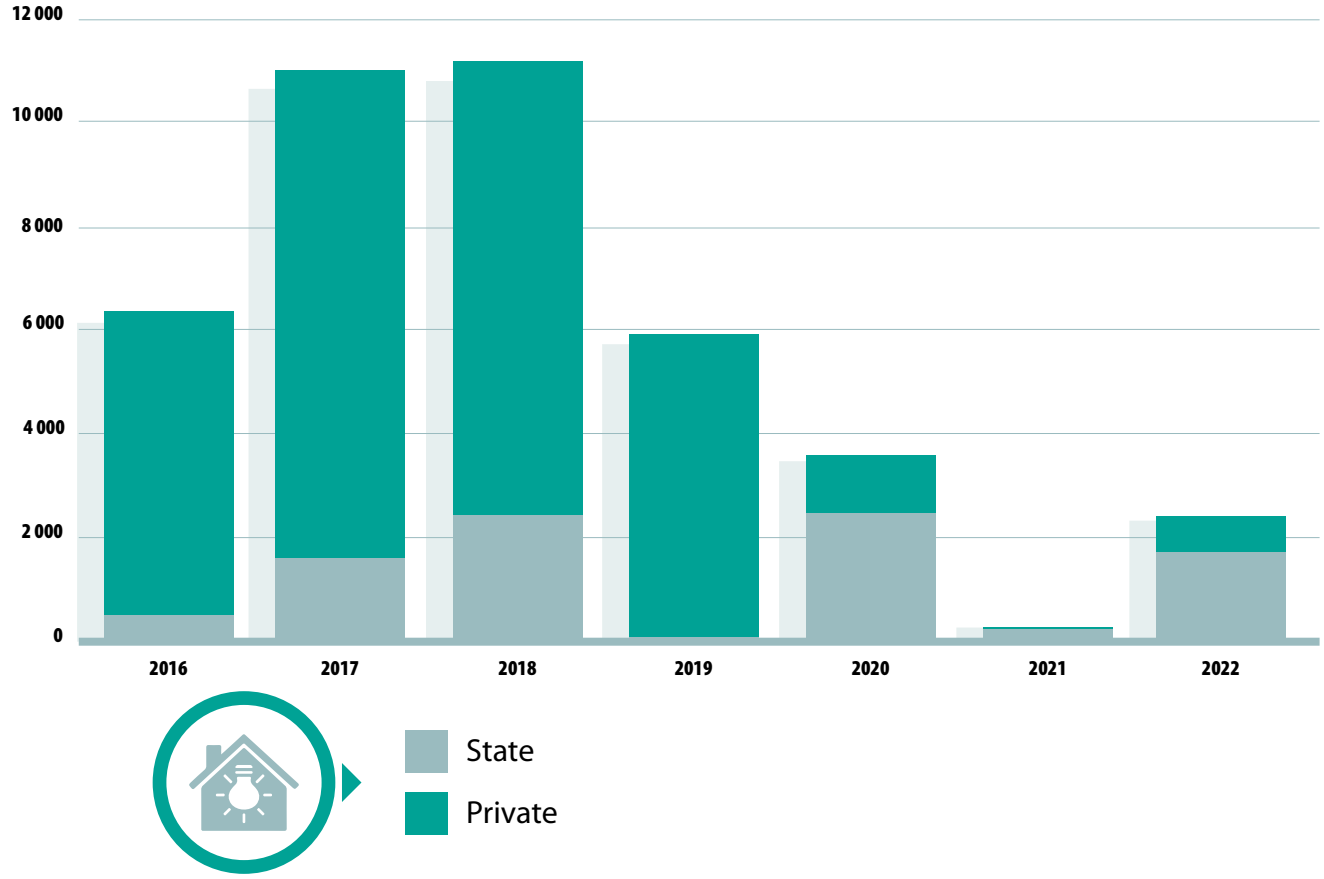
Mexican President Andres Manuel López Obrador has openly pursued the primacy of state control over the energy sector, blocking the development and operations of private energy projects, including renewable generation. Through legal changes, policies, denial of permits and other administrative procedures, CFE and Pemex have regained market share at a high cost to consumers and manufacturers. Figure 2 shows the annual capacity permitted by the Energy Regulatory Commission (CRE) since 2016, revealing a decline in permitted capacity for private entities since 2020,[10] with an increase in permits issued to state entities. Of those permits for the state entities, less than 500 MW were for clean energy **(representing about 5.5% of the total permitted capacity for the state during that period).** These measures have prevented Mexico from achieving a more sustainable energy sector in line with global trends and Paris Agreement commitments.

[8]FORD SUSTAINABILITY INITIATIVES CONTINUE TO EXPAND IN MEXICO, https://fordauthority.com/2022/06/ford-sustainability-initiatives-continue-to-expand-in-mexico/#google_vignette

[9]https://www.bostonscientific.com/en-EU/about-us/corporate-social-responsibility/planet/climate-change.html

[10]The private permits in 2022 were for small projects with an average capacity of 26.5MW.

FIGURE 2. GENERATION PERMITS ISSUED BY CRE (IN MW)[11]



Source: Data from Comisión Reguladora de Energía (CRE)

According to Bloomberg New Energy Finance, in 2022 Mexico ranked 63rd on the list of the most attractive markets for investing in energy transition projects, while it ranked 4th in 2017. Mexico stands out as the country that has experienced the steepest decline in the ranking over the past five years.[12]

Furthermore, adding load and generation to the system has become increasingly difficult and expensive; investment in transmission and distribution stagnated over the past five years. Today, connecting new load to the grid requires additional networks and substation investments. According to a survey conducted among its members by the Chamber of Transformation Industry of Nuevo León, CFE has delayed or rejected the requests of 67 percent of the companies that have sought to increase their electrical capacity.[13] In the case of generators, the government is allowing some interconnections only if the new generators pay for these reinforcements and additions, making it prohibitively expensive to interconnect.

[11]CRE, TABLA DE PERMISOS DE GENERACIÓN E IMPORTACIÓN DE ENERGÍA ELÉCTRICA ADMINISTRADOS AL 31 DE JULIO DE 2023

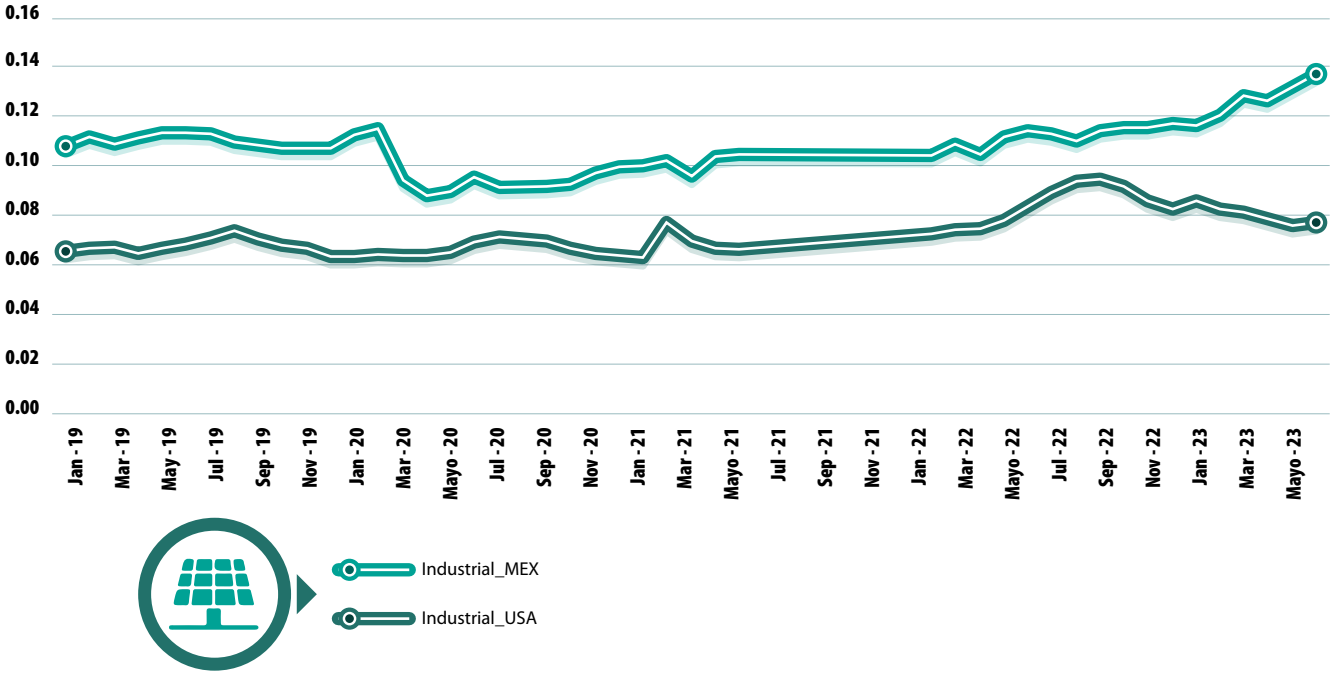
[12]2022 Bloomberg NEF Climate Scope https://www.global-climatescope.org/results/

[13]ABC Noticias Crisis en Nuevo León: Ahora temen por la electricidad, https://abcnoticias.mx/local/2022/8/8/crisis-en-nuevo-leon-ahora-temen-por-la-electricidad-168367.html

Buying electricity from Mexico's state-owned CFE, which is the only option for many companies with energy consuming-intensive processes, as well as for possible new entrants, is more expensive than electricity in the United States. Figure 3 highlights this difference over the past three years.

Service has also not been reliable across the country. In Nuevo Leon, a large private plant (about 500 MW) that supplied hundreds of companies has been taken offline since early 2022. Although there is no official information readily available, journalists have reported reoccurring outages in the area that have lasted days.[14] Such outages for manufacturing plants can have devastating financial consequences.

FIGURE 3. U.S. AND MEXICO INDUSTRIAL ELECTRICITY RATES, 2019 – MAY 2023 (IN USD)/KWH[15]



As noted above, many multinational companies with Net Zero targets or similar are making environmental commitments, including buying mostly or only renewable energy and/or seeking offsets. Over 500 companies from various sectors (such as automotive, pharmaceuticals, cement, and food processing) are part of the U.N. Net Zero campaign, committing to accelerate the reduction of 50% of their GHG emissions to reach Net Zero by 2030 — 20 years ahead of the targets established in the Paris Agreement by 2050.[16] This means that they are required to use an increasing amount of renewable energy.

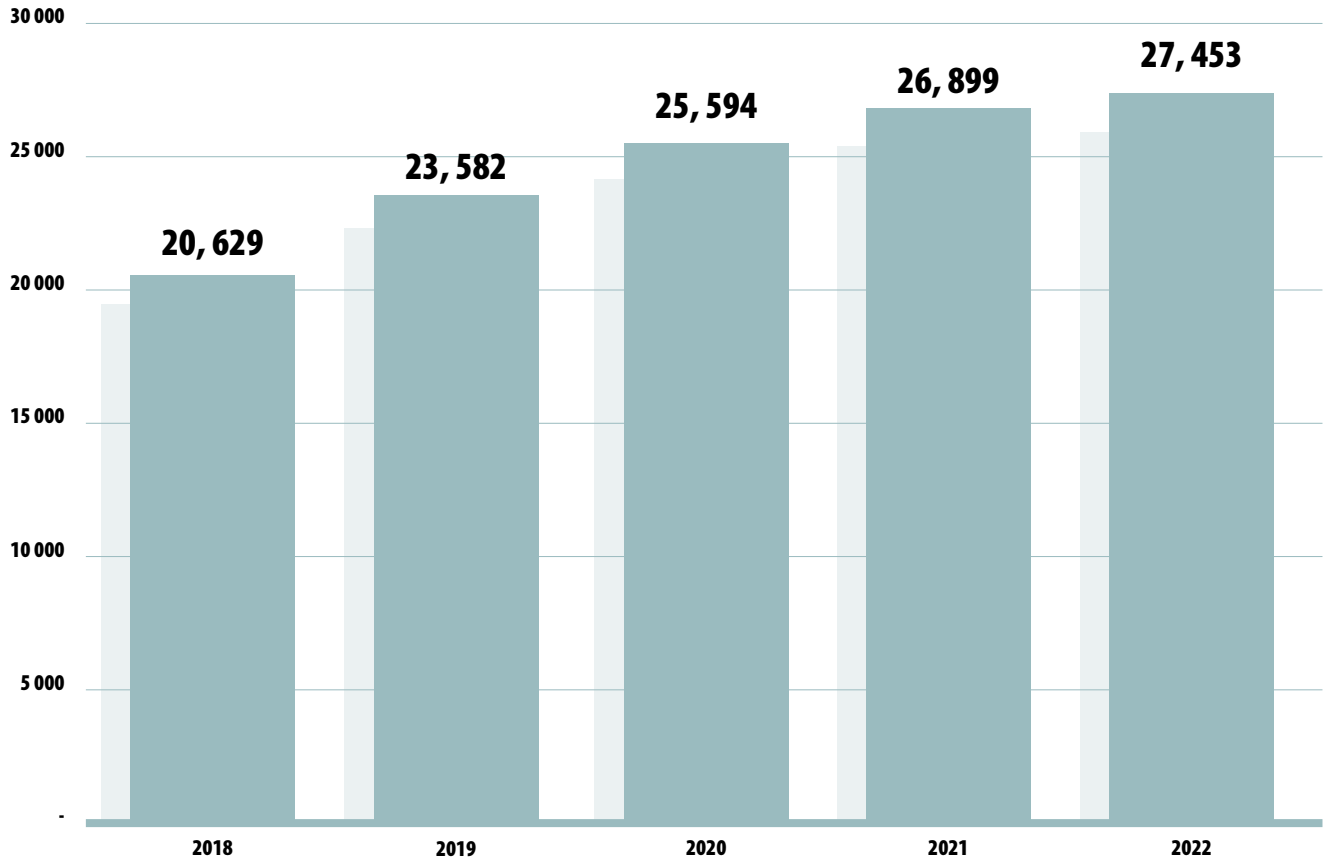
Until 2018, Mexico's long-term electricity auctions resulted in the addition of 7.5 GW of clean energy. The auctions were cancelled by the current administration without an alternative mechanism. As a result, only 0.55 GW of renewable generation were added in Mexico from 2021 to 2022 as highlighted in Figure 4. The growth seen between 2019 and 2021 resulted from previously awarded projects.

[14] https://www.sdpnoticias.com/estados/nuevo-leon/apagon-cenace-declara-estado-de-emergencia-en-compuerta-de-zona-sur-de-monterrey/

[15] U.S. national average retail electricity price information, for the industrial sector, from the EIA consulted at: Electricity Data Browser (eia.gov). Industrial electricity rates estimated as the weighted average of GDMTO, GDMTH, DIT and DIST rates, consulted at CRE's website: Datos Abiertos de México - Memorias de calculo de tarifas de suministro básico

[16] Including companies such as Audi, Volkswagen, BMW, CEMEX, AstraZeneca, Domino's Pizza, among others. Information consulted at: Net Zero Coalition | United Nations

FIGURE 4. MEXICO'S RENEWABLE GENERATION CAPACITY, 2018 – 2022[17]

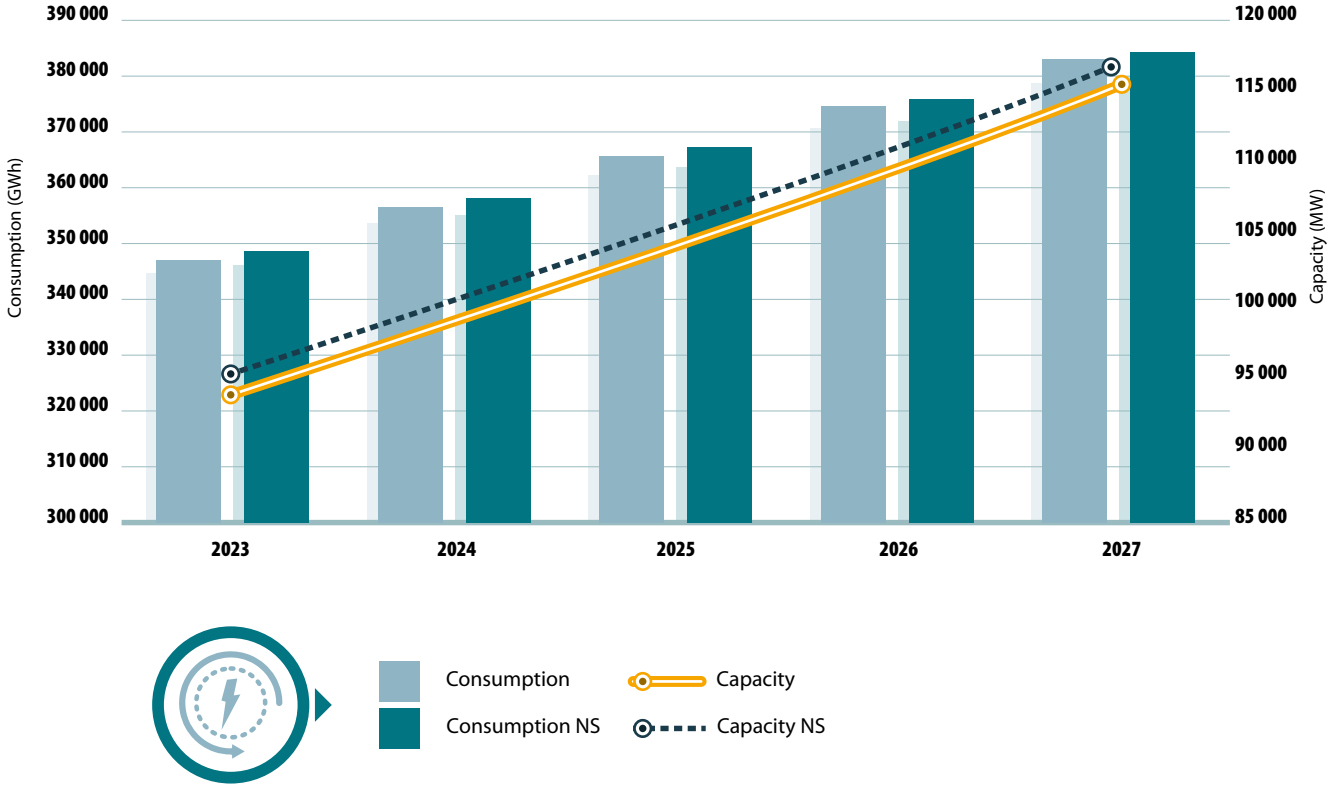


Considering the effect that nearshoring will have on economic growth and, consequently, electricity consumption and demand, we estimate additions of up to 2.9 GW of installed capacity will be required to meet this demand increase (see Figure 5).[18]

[17]PRODESEN 2023, accessed at: Anexo1.pdf (energia.gob.mx). It considers wind, solar, hydro, geothermal, bioenergy and battery capacity.

[18]For reference, from 2021 to 2022, Mexico's interconnected installed capacity increased by 977 MW, less than 1 GW.

FIGURE 5. ELECTRICITY CONSUMPTION AND GENERATION CAPACITY PROJECTIONS WITH AND WITHOUT NEARSHORING[19]



PRODESEN 2023 estimates that approximately **60%** of new capacity additions through 2026 will come from renewable generation sources **(solar, wind and battery banks);**[20] it is likely more than half of the 2.9 GW of additional capacity resulting from nearshoring will need to be renewable. That implies large investments in the future. NREL estimated that investment from renewable generation capacity will need to reach at least **US$ 8.4 billion.** That said, investment in transmission and distribution networks has stagnated over the last five years. From 2018 to 2022, the transmission network grew less than **2.5% in total.**

In Mexico, the limited availability of reliable electricity, especially clean energy, poses a challenge for embracing nearshoring fully. Whichever administration takes office in 2024 must reconsider current energy policies to support both nearshoring-driven economic growth and the demands of new investments, including renewables. Collaboration will be essential, as CFE alone cannot meet the operational, logistical, and financial requirements.

[19]With information and projections of electricity consumption reported by PRODESEN 2023, considering the amount of capacity that increases in the system for each percentage increase in electricity consumption and demand.

[20]PRODESEN 2023: Capitulo4.pdf (energia.gob.mx)

Low-Cost Natural Gas is an Advantage

Natural gas is the largest fuel source in Mexico's electricity generation mix, powering almost half of the total. It is also a key input for some industrial processes. Mexico continues importing roughly **90% of the natural gas** it consumes, almost exclusively from the United States. Local natural gas production only slightly recovered in 2022 after years of decline. Natural gas imports will continue to play a crucial role in meeting Mexico's future energy demands. As such, overall energy costs, including transportation, should stay higher than in parts of the U.S.

The shale gas revolution along with a strong, dynamic, and well-functioning market has allowed the U.S. to enjoy some of the cheapest natural gas prices in the industrialized world for years, and Mexico has also benefitted. Pipeline capacity to transport U.S. gas to Mexico doubled during the last five years and U.S. natural gas exports to Mexico hit a new monthly record high in June 2023. An important new pipeline system known as Wahalajara transports natural gas from Waha, Texas all the way down to Jalisco. This growth in transport capacity, with the potential to expand, coupled with U.S. natural gas availability can readily support nearshoring in existing corridors. This highly competitively priced natural gas is an advantage for the region. While gas prices have stayed below **US$ 4.00/MMBtu** in the United States and Mexico, in East Asia the price is close to**US$ 15/MMBtu.**

Security Risks an Impediment to Energy Transition

Beyond Mexico's current regulatory challenges to promote a clean energy transition, its security situation remains a major obstacle for both companies considering nearshoring investments and investors considering energy-related infrastructure projects. In our industry survey, security was identified as the top concern, the most important barrier, and most relevant issue from a cost and economic impact perspective. For potential nearshoring companies, insecurity means additional time and costs, as well as safety risks.

This issue was recently highlighted by Alvaro Oliver, CEO of the Mexican renewable energy company Grupo Corporativo GEMEX, who observed that in Ciudad Victoria, Tamaulipas his company has suffered losses and service disruptions due to transmission lines being stolen by an organized crime syndicate to re-sell the copper wire.[21] The issue is not limited to Tamaulipas, as Mexico City suffered similar losses with the theft of over 14km of copper wire from its subway system in 2022.[22]

[21]Alvaro Oliver, CEO, GEMEX comments at North American Development Bank Summit, San Antonio, Texas, August 30, 2023.

[22]"14 km of electrical cable stolen from CDMX Metro in 2022," Mexico Daily News, February 1, 2023.

To emphasize the significance of security in Mexico, we compare Guadalajara with Hanoi, Vietnam as an electronics sector proxy, and Hermosillo with George Town, Malaysia as a proxy for semiconductors using data from Verisk Maplecroft's analysis. A lower score represents a higher security risk, while a score of 10 represents the least security risk.

Figure 6: Security Comparison

	Civil Unrest	Conflict Intensity	Crime	Terrorism
Guadalajara, Mexico	3.17	10.00	0.05	10.00
Hanoi, Vietnam	6.40	10.00	8.46	6.40
Hermosillo, Mexico	4.15	10.00	0.21	10.00
George Town, Malaysia	5.46	9.85	9.11	7.15

* Composite including Verisk Maplecroft's Counterterrorism Capability, Terrorism Risk and Terrorism Threat Indices

Source: Verisk Maplecroft

According to Verisk Maplecroft, the main areas of concern for operations in the Mexican cities of Guadalajara and Hermosillo relate to Crime **(prevalence of homicides, property crime and theft)** and Civil Unrest **(risk of disruption to business caused by the mobilization of societal groups in 2024).** The very high-risk score is underpinned by the strong presence of criminal groups in the Guadalajara Metropolitan Area. Competition between organized crime groups (OCGs) for control over profitable legal and illegal activities drives high levels of violence. Maplecroft expects Guadalajara's security outlook to remain challenging during the next two years, particularly for businesses operating in sectors captured by OCGs.

In the case of Hermosillo, the State of Sonora serves as one of the main gateways of fentanyl into the United States. Federal Highway 15 – one of Mexico's most important commercial highways, connecting Mexico City to the U.S. – crosses Hermosillo. Consequently, travel risks remain high, with routine security incidents – including drug trafficking and seizures, targeted executions, and shootouts – taking place, which explains the 'Very high' risk score on the Crime Index.

Blockades on Federal Highway 15 by the Yaqui indigenous community represent the most significant supply chain disruption for companies, which is reflected in the Civil Unrest Index. The similar Index for Guadalajara is explained by the concentration of incidents, given that the city is the focal point of political and economic power of the state and attracts protesters from different social groups. Many of these protests can disrupt the movement of goods and/or personnel. In addition, blockades force detours to less traveled streets, which can push traffic towards more dangerous neighborhoods with higher security risk.

In contrast, the main area of concern in Hanoi relates to civil unrest. Hanoi has the lowest possible scores on Maplecroft's Terrorism Intensity Index[23] and Conflict Intensity Index (assesses the risk and severity of armed conflict), which reflects the absence of attacks in the city over the last five years. Finally, Hanoi records comparatively low rates of violent crime. However, petty crime, fraud and cybercrime are relevant risks to business and business travellers.

In the case of George Town, the leading concerns are civil unrest and to a lesser degree terrorism. Elections and other political developments have been triggers for unrest in Malaysia in recent years, while social issues can also prove incendiary. George Town has the lowest possible Terrorism Intensity Index Score, reflecting the absence of attacks over the last five years. The background risk of Islamist terrorism in Malaysia is factored into George Town's overall Terrorism Risk Index score.

This brief security analysis demonstrates a stark difference in security risk between nearshoring in Mexico and friendshoring in Vietnam and Malaysia. The risk differential translates to additional costs. It may also impact whether a company chooses to relocate operations to Mexico. Our survey data supports these conclusions.

Logistics – Room for Improvement

One of the primary rationales for shifting production to North America stems from its proximity to the market. Even if the geographical distance is shorter, optimal infrastructure and a working system is needed to fully leverage the advantage of being closer. The World Bank's Logistic Performance Index (LPI) is an indicator of the efficiency of the import/export process between countries. Surveys are used to calculate the overall score of a given country, including six key dimensions of international trade:

(i) efficiency of the clearance process[24] by border control agencies, including customs; (ii) quality of trade and transport related infrastructure (e.g., ports, railroads, roads, information technology); (iii) ease of arranging competitively priced shipments; (iv) competence and quality of logistics services;[25] (v) ability to track and trace consignments; and (vi) timeliness of shipments in reaching destination within the expected delivery time.[26]

[23]This index combines data on the frequency and intensity of five years of attacks with an assessment of the threat posed by active terrorist groups, and whether counterterrorism forces in the country have the capacity to deal with this risk.

[24]For example, speed, simplicity and predictability of formalities.

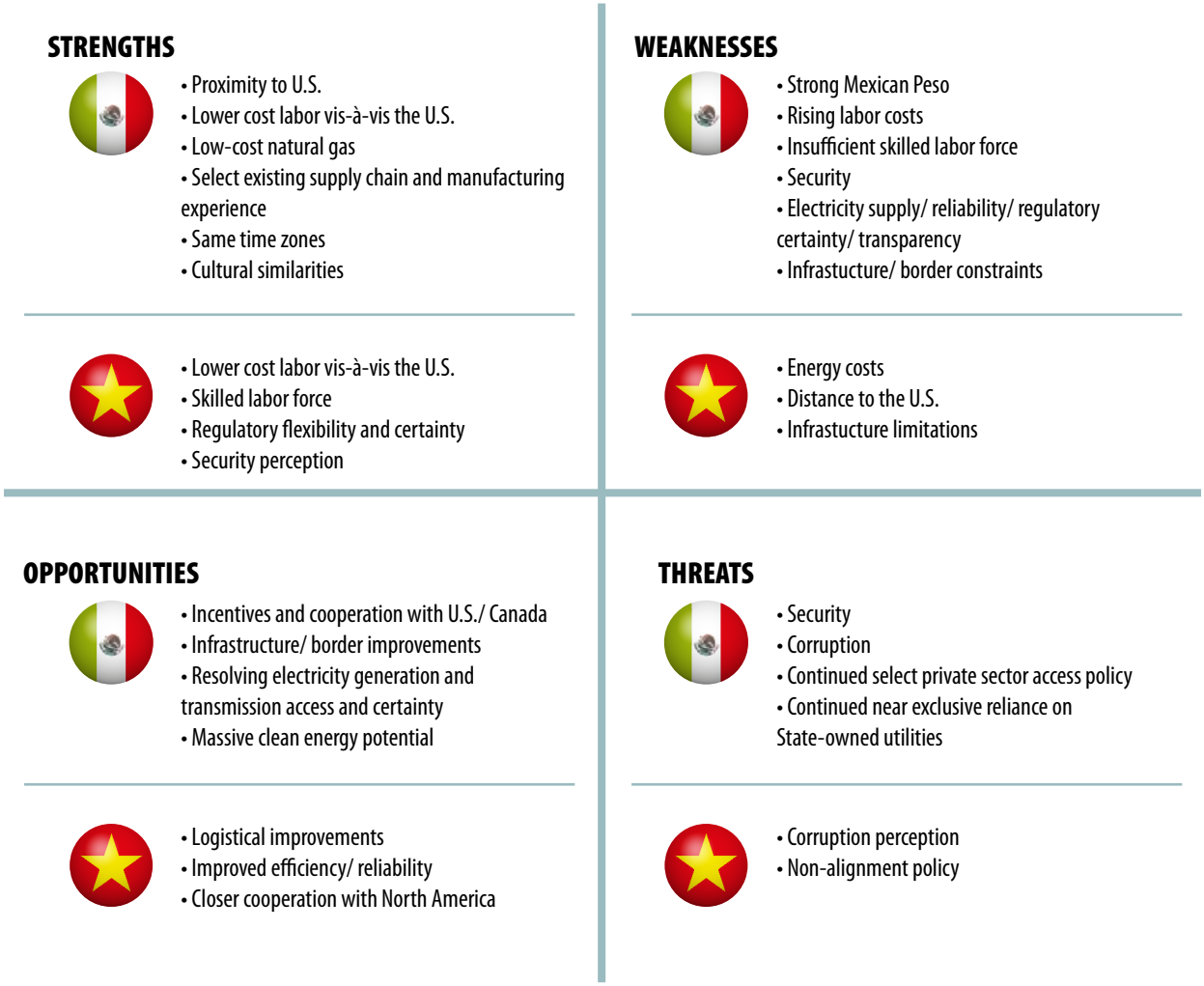
[25]For example, transport operators, customs brokers

[26]LPI_2023_report_with_layout.pdf (worldbank.org), p. 12.

Mexico's LPI score (2.9) is lower than for China (3.7), Vietnam (3.3) and the United States (3.8).[27] Furthermore, it has decreased over the past years, while China's has improved, widening the gap between the two countries. According to the WB' study, the greatest opportunity for improvement in Mexico is in customs, which is now controlled by the military.

To summarize this section, we have developed a brief Strengths-Weaknesses-Opportunities and Threats (SWOT) analysis on Figure 7, which offers a unique view of how attractive each destination is as companies consider relocating operations away from China.

Figure 7: Sino-Mexico Nearshoring SWOT Analysis



[25]5 is the highest score possible and 1 the lowest. World Bank, LPI Index, available at: Source: MDS Transmodal (2022, 2nd quarter) and MarineTraffic (2022, January 1 to June 30) | Logistics Performance Index (LPI) (worldbank.org)

Conclusion

The trendlines that point to deeper nearshoring in Mexico are evident. The proximity to the U.S. market, legacy of NAFTA and current USMCA are important, not to mention post-pandemic geopolitics and supply chain management. Still, as our analysis highlights, significant challenges remain to achieve more robust nearshoring in Mexico. Principal among those are energy and security.

As we noted, electricity has proven to be a particularly complicated challenge given the current state of electricity-related infrastructure, supply-demand dynamics, and the current government's policies. Those domestic issues must also be combined with decarbonization goals and Net Zero commitments requiring that international companies reduce emissions and procure cleaner energy and deploy sustainability measures across their value chains. It is increasingly unclear if companies can meet those commitments at their facilities in Mexico. Therefore, energy **–electricity really–** may not only be an additional cost, but a potential deal-breaker for potential nearshoring companies.

Appendix A
Nearshoring Survey of Executives in Mexico

Nearshoring in Mexico - Survey Results and Analysis

Surveys are a fundamental tool in empirical research, facilitating the collection of data and insights pertinent to various topics, such as nearshoring in Mexico. Our survey sought to investigate barriers and incentives related to nearshoring investment in Mexico and North America. It consisted of six questions querying respondents on their experiences and perceptions. A total of 32 participants, representatives from major global companies and manufacturers operating in Mexico, participated in the survey carried out during August and early September 2023.

Question 1: Which sector do you work in?

Our survey captured a diverse cross-section of industries that are either actively engaged in or significantly impacted by nearshoring strategies across North America. By categorizing respondents into various sectors, including automotive, medical supply/pharmaceuticals, electronics, and others, and notably, with nearly a quarter of participants belonging to the medical supply/pharmaceuticals industry (19%), our survey provided key inputs and data for our white paper and important insights into the distinct challenges, opportunities, and ramifications associated with nearshoring.

Question 2: Rank the following items in terms of barriers or complexity regarding nearshoring investment or potential investment (Rank top 3).

Based on our survey results, security emerged as the foremost concern regarding nearshoring investment or potential investment in Mexico. The survey question listed six topics, including security, water, electricity, infrastructure other than water or electricity, logistics, and permitting, and respondents were instructed to rank their top three answers. Approximately **53%** of participants **(with an average ranking of approximately 1.59 out of 3)** ranked security as their primary concern. In contrast, electricity garnered a lower average ranking, with only about **38.67% (with an average ranking of approximately 1.16 out of 3)** of respondents considering it as their principal concern. Infrastructure, excluding water and electricity, secured the third position, with **37.33% (with an average ranking of approximately 1.12 out of 3).** These findings underscore that security-related issues in Mexico continue to be the predominant factor impeding potential investment and potential investors. This holds true even in scenarios where electricity costs are elevated or where the electricity supply is perceived as inconsistent or unreliable, potentially affecting operational and production aspects.

Question 3: Rank the following items in terms of added cost related to nearshoring investment in Mexico vs. other global relocations considered (Rank top 3).

The survey results reveal the most significant factors influencing added costs in nearshoring investment in Mexico compared to other global relocations considered. This survey question listed the same topics as the previous and resulted in a similar result. Security was again the foremost concern, with a substantial average ranking of approximately **64.67% (with an average ranking of approximately 1.94 out of 3).** This underscores the paramount importance of addressing security-related costs when contemplating nearshoring in Mexico. Following closely, infrastructure other than water or electricity emerges as the second-highest concern, with an average ranking of about **42.67% (with an average ranking of approximately 1.28 out of 3).** This indicates that investing in infrastructure improvements is crucial to mitigating additional costs associated with nearshoring in the region. Lastly, permitting, with an average ranking of **33.33% (with an average ranking of approximately 1 out of 3)** also features prominently as a factor influencing added costs. These findings emphasize the necessity of streamlining permitting processes to enhance the economic appeal of nearshoring in Mexico.

Question 4: Most compelling reasons to consider nearshoring to North America (Rank top 3)?

This survey question listed lower cost of labor, proximity to the U.S. market, established supply chains, incentives, and geopolitical considerations to determine the most compelling reason to consider nearshoring in North America. Proximity to the U.S. market emerged as the overwhelmingly dominant factor, with an average ranking of approximately 2.31 out of 3, equivalent to a substantial **77%.** This underscores the strategic advantage of geographical proximity to the vast U.S. market, which holds significant sway in the decision-making process. The convenience of being closer to consumers, suppliers, and distribution networks is a compelling draw for businesses. Established supply chains closely follow, with an average ranking of 1.62 out of 3, representing a substantial **54%.** This highlights the importance of well-established and efficient supply chains as a critical factor in nearshoring to North America. Leveraging existing networks and infrastructure can enhance operational efficiency and reduce costs. Surprisingly, lower labor costs, often considered a primary driver for nearshoring decisions, rank lower than expected. Labor cost received an average ranking of 0.78 **(26%),** indicating that while it remains a consideration, it is relatively less influential compared to other factors like proximity and supply chain reliability. Increased wages and a strong Mexican Peso have likely held sway.

Question 5: If you have undertaken nearshoring investment, what issues or costs have been more time-consuming than anticipated (Rank top 3)?

The survey results provide insight into the specific challenges that businesses encounter during their nearshoring endeavors. Surprisingly, issues related to security, securing a location, and water, with average rankings of **31.67%, 19.67%, and 19.67%,** respectively, ranked lower in terms of being more time-consuming or costly than expected. In contrast, the permitting process, excluding electricity or water, was notably more time-consuming or costly than initially expected, with a **62%** average ranking. Electricity-related issues, such as cost or availability, also emerged as a significant concern, receiving an average ranking of **33.33%.** Incorporating or registration processes received a similar average ranking of **33.33%,** indicating that respondents found these administrative procedures to be more time-consuming or intricate than initially foreseen.

Question 6: If you have undertaken nearshoring investment, how do you anticipate further nearshoring investment for your company over the next three to five years?

The responses reveal that a slight majority of participants, comprising 58%, anticipate making meaningful new investments in nearshoring within this timeframe. This signifies a positive outlook on the growth and expansion of nearshoring operations, suggesting that businesses see North America as an attractive and sustainable region for their operations. On the other hand, **29%** of respondents indicated that they do not foresee any new investments in nearshoring, which may reflect a stance of maintaining current operations without significant expansion. Additionally, a smaller subset of participants, accounting for **13%,** mentioned the potential reduction of investment through divestiture or joint ventures. This could indicate a more cautious approach or strategic restructuring among some businesses.

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