# Energy Business Opportunities: Mexico → 2024

Reinterpreting the Reform: Capitalizing Emerging Opportunities

GOODRICH
RIQUELME
ASOCIADOS

# Energy Business Opportunities: Mexico → 2024

Reinterpreting the Reform: Capitalizing Emerging Opportunities

GOODRICH RIQUELME ASOCIADOS

1Q,2020

**Mexico's 2013 Energy Reform** amounted to a game changer with no precedent, due to its scope and depth. In essence, it created a market ecosystem under the umbrella of robust and independent regulators. Its magnitude deserved global recognition, including that of specialized agencies, such as the OECD's International Energy Agency.

Upon its acknowledgment of the Energy Reform, President's López Obrador ("AMLO") decision to keep it intact has been well perceived by the markets. Additionally, the institutional design continues to be in place and reasonably functional, despite the changes on public policies, such as the temporary suspension of E&P rounds and energy auctions. Moreover, the ecosystem continues to be evolving -via secondary market- and global operators are successfully de-risking their assets and monetizing some of their ventures.

Although the Mexican Energy markets might not look as super-hot as in recent years, there are numerous areas of opportunity throughout the value chain. The stability of the Energy Reform in addition to the success of corporations from dozens of nationalities still provide the confidence for new investors of all sizes.

The current government has expressed its interest to collaborate side-to-side with the private entities in order to encourage foreign and national investment in infrastructure projects within Mexican territory.

This positive willing led to the collaboration of several private entities towards the development of a National Investment Infrastructure Agreement, that included 147 projects with an estimated investment of 42 billion dollars, for transportation, telecommunication, tourism, among others. In such terms, it has been announced that in the following years, the private entities will invest in 20% of the oil and gas projects and 46% of the electric ones, contained in the National Investment Infrastructure Agreement.

It is also important to emphasize that under the United States-Mexico-Canada Agreement (USMCA), Mexico would not be able to roll back the 2013 energy reform, thus allowing the continuance of foreign investment in the industry by making some protections available in the event of any dispute with the Mexican government (including PEMEX and CFE).

With over 85 years of experience in assisting foreign investment in their soft-landing to Mexico, allow us to guide you towards the detection of such opportunities.

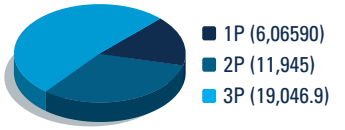
# OIL & GAS

1

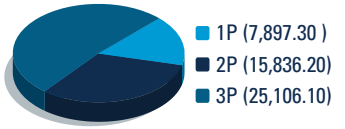
## EXPLORATION & PRODUCTION

As confirmed by the current presence of almost all IOCs and tier-1 operators, the E&P Industry has been specially interested in Mexico's resources. Some key data as to the volume and distribution of reserves and prospective resources produced (1Q 2019) by the National Hydrocarbon Commission ("CNH"), which is the E&P Regulator:

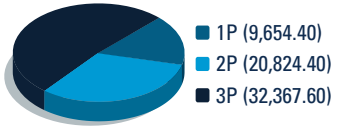
**Crude Oil Stocks** (Billions of Barrels)




**PCE stocks** (Billions of Barrels)



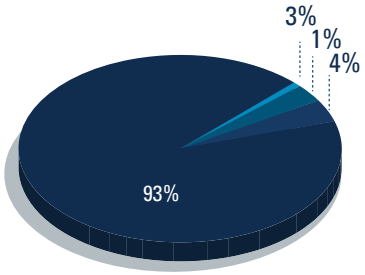

**Gas Stocks** (Billions of Barrels)




| Basin | 1P PCE (bn) | 2P PCE (bn) | 3P PCE (bn) |
|---|---|---|---|
| Burgos | 199.0 | 365.7 | 568.9 |
| Golfo de México Profundo | 63.5 | 164.7 | 859.8 |
| Sabinas | 4.8 | 8.4 | 11.4 |
| Sureste | 6,307.8 | 19,931.0 | 16,093.7 |
| Tampico-Misantla | 865.5 | 3,328.5 | 6,130.1 |
| Veracruz | 456.6 | 1,037.9 | 1,442.2 |
| TOTAL | 7,897.3 | 15,836.2 | 25,106.1 |

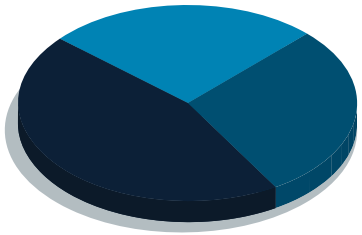
Presently there are over 73 oil companies holding 111 E&P contracts active in 107 awarded blocks with guaranteed obligations to drill 331 wells, already approved in both, Exploration and Development Plans.

### Current E&P Contracts

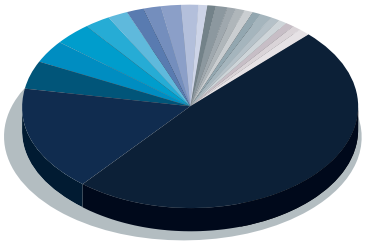



The distribution of such blocks and the nationalities of the E&P corporations currently active in exploratory and development activities are considered in the following charts:

### Location of E&P Contracts




### Companies by nationalities with allocated contracts






The E&P Contracts have a minimum life of 35 years with the corresponding phases of any E&P Operation worldwide. The performance status of the CNH contracts is the following:

- **Exploration: 58**
- **Assessment: 17**
- **Development: 30**

## PEMEX'S CHALLENGES AND OPPORTUNITIES AS AN E&P OPERATOR

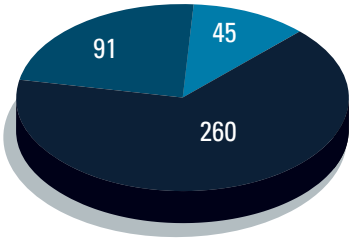
**In addition** to the CNH's awarded E&P Contracts, Pemex (Mexico's NOC) retains 396 licenses (asignaciones). While some of them (especially in Deep Water) might still be subject to farm-out campaigns, the vast majority will continue to be run via integrated and discrete services, as a result AMLO's criticized approach regarding the role of Pemex in Mexico's post-Energy Reform.

**Despite** such approach, Pemex and global E&P consultants have been recently working towards the design of risk-based contracts, which may mirror the economics of incremental production agreements. If appealing to best-in-class operators and investors, Pemex will be in better shape to reverse its prolonged production decrease by 2024.

**The development** phase of Pemex's licenses is the following:

### The development phase of Pemex´s licenses is the following:

### Pemex´s license portfolio (396)




**Although** the AMLO Administration has been somewhat erratic as to the continuation of CNH Rounds and Pemex's farmouts, it has become abundantly clear that neither Pemex nor the Federal Administration have the financial capabilities to make the most out of Pemex's 396 licenses.

**Despite** private operators are committed to produce 200K BOE by the end of the Administration (2024) and Pemex might reverse its rather long and deep E&P decline, the objective to achieve a national production of 2.8M BOE by 2024 has been perceived as fundamentally challenging by practically all analysts. Current production is nearly 1.7M BOE.

## CURRENT E&P SECONDARY MARKET OPPORTUNITIES

In addition to external factors, achieving such a goal will depend on domestic stability plus a mixed of continuation of certain CNH rounds, Pemex farm-outs (especially in Deep Waters), reconsidering the vast unconventional portfolio, as well designing risk mechanisms that may be appealing to best-in-class operators and investors regarding most Pemex's licenses.

**Because** we see governmental signs that at least some of the above elements are taking shape, we are confident that investment opportunities will arise for the already present operators, as well as for new players and oilfield services companies.

**Our confidence** also derives from the already hot secondary market. The farm-in transactions that we describe below result from three key factors: (i) materiality; (ii) stability; and (iii) asset de-risking. As those elements will continue to be present in the short and mid-terms, we clearly see an increase of secondary market activity, either via farm-in mechanisms (mainly involving foreign operators) and even M&A transactions (associated to Mexican ones).

**To confirm** our thesis, consider that by the end of 2019, CNH has authorized at least 10 changes of control and more requests are on the way. The following cases are representative of our understanding of the opportunities, as they involve assets in numerous basins, both offshore and onshore.

**a. Premier Oil's** selling exercise regarding its participating interest in Zama
**As one of Mexico's** most relevant shallow-water discoveries in the last 20 years, Zama represents 1B BOE of light oil. Upon the assessment of the field, Premier is in the process of farming-out. However, it will continue to be present in other fields, where it conducts exploratory activity.

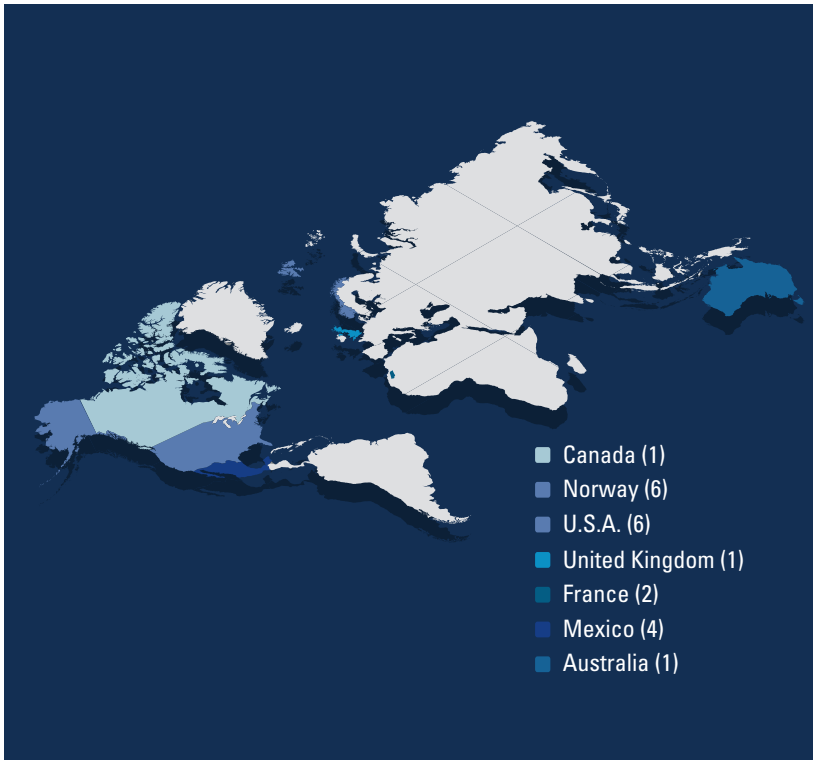
**b. Chevron farms** in on Shell's Deep Waters Portfolio
**On October 2019**, CNH authorized Chevron's acquisition of 40% of Shell's participation in its Deep Waters portfolio (Salinas Basin – Blocks 20, 21 and 23). There are technical indications that the potential discoveries in Deep Waters might be substantial, with the associated need to share the risk and the heavy investment.

**c. Wintershall** DEA acquires all assets from Riverstone's Sierra Oil
**Upon its global** merger, Wintershall DEA, which already is one of the most active operators in Mexico acquired all assets of Riverstone's Sierra Oil. In so doing, the German company acquired also a 40% on the Zama field.

## CURRENT OPPORTUNITIES ON SURFACE EXPLORATION

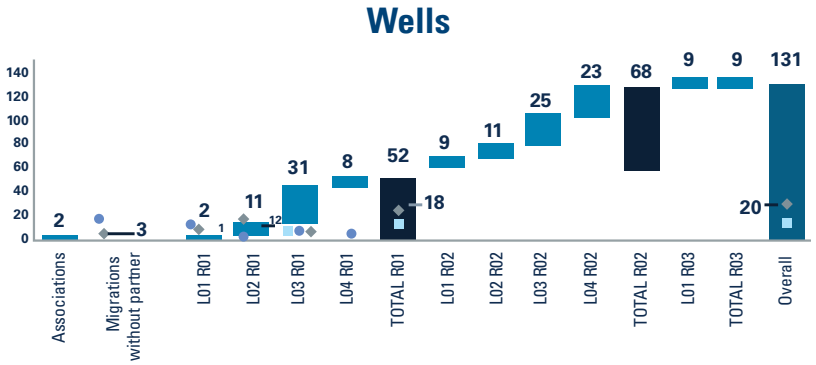
Right from the early stages of the Energy Reform's implementation, surface exploration has been considerably active in the country. By far, Mexico has been the most surface-explored spot in the planet during the last 5 years.

Over 80 surface exploration authorizations have been granted by CNH during the 2015 – 2019 period alone. Even with such robust campaigns, a lot still has to be done in order to complete dozens of exploratory plans already approved and many more expected to be tabled by both, private operators and Pemex during the next 1-2 years. A first glance to the diversity of companies authorized to produce surface exploration is shown in the following chart:



## OPPORTUNITIES IN OFFSHORE E&P INFRASTRUCTURE AND OILFIELD SERVICES

Taking into consideration that a great total of 331 wells have been approved in both Exploratory and Development plans by CNH as of 2019, Mexico is effectively booming in terms of E&P infrastructure, equipment and of course, talented people. The status of the Wells already approved is the following:




Source: Pulso Energético, May 2019 (with information by CNH and AMEXHI).

With such an intensive level of activity, some of the business opportunities for marine contractors of all kinds are the following:

- MODUs (Mobile Offshore Drilling Units) in general.
- FPSOs (Floating Production, Storage and Offloading)
- Jack-up rigs
- Semi-submergible rigs
- Fixed-rigs and related facilities
- Offshore vessels of all kinds
- Flotels

## OPPORTUNITIES IN ONSHORE E&P INFRASTRUCTURE AND OILFIELD SERVICES

As of the end of 2019, 30 contractual areas are executing their obligations under Development Plans authorized by CNH. Most of those development phases are taking place in onshore assets.

Although a few international operators such as Wintershall DEA and Perenco are heavily invested in onshore blocks, most of the assets are still in Pemex's hands. A few Mexican operators are also active onshore.

In addition to the ordinary opportunities for onshore E&P operations, there is a monumental need to develop infrastructure associated to gathering, separation facilities, blending, storage, transportation and export facilities.

Nowadays, most of the onshore infrastructure belongs to Pemex. Due to the lack of investment capabilities, it is obsolete for the new vibrant industry that is emerging from the Energy Reform. Furthermore, the netback tariffs being charged by Pemex to its clientele (private operators) makes no sense from a value perspective. Accordingly, the need of onshore infrastructure is truly a desparate need for practically all operators.

Ad hoc collective solutions, including quality banks will be the future for onshore operators, which by the way sited in vast unconventional fields, still to be developed. Opportunities for both, private equity funds and industrial players will certainly be as juicy as those in the offshore segment.

## OPPORTUNITIES ON GAS TO WIRE SOLUTIONS

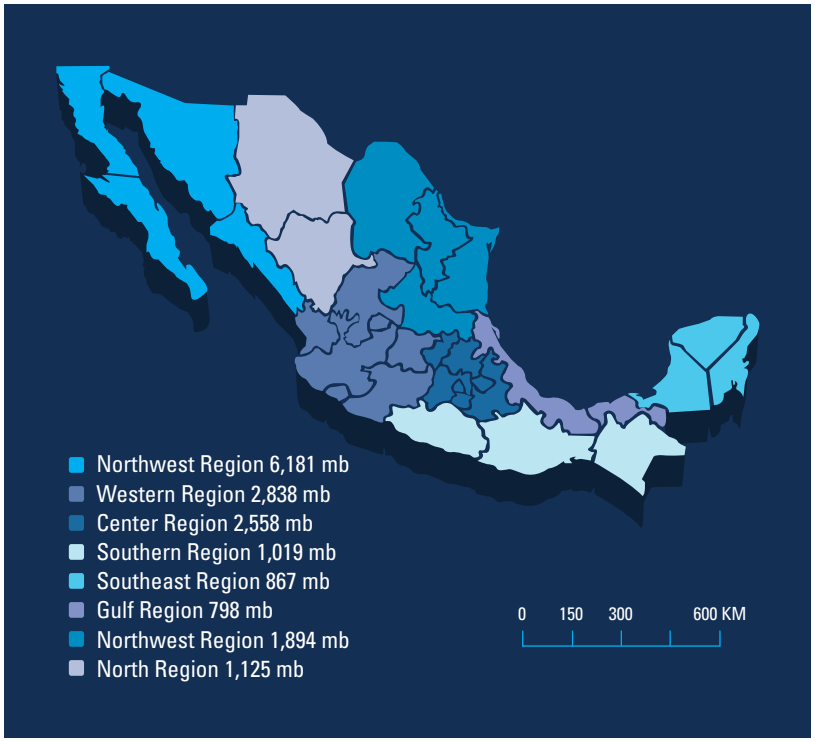
As experienced in the USA, many fields -specially onshore ones- are facing severe obstacles to increase crude production, because of the percentage of associated gas and the lack of commercial solutions to use it.

Accordingly, in addition to mechanisms to electrify as much E&P operations as practicable, there is a vast potential of associated (and dry) gas to be used in combined cycles to be interconnected to the grid and in so doing, enjoy the benefits of Mexico's lucrative wholesale electricity market. Doing so, will not only enable crude production increase, but will also do its part in terms of sustainability, as the big gas flaring and venting problem will be converted into sustainable electrification.

Traders and developers are already looking at scalability to take advantage of such abundance of gas and electrical connectivity. Although the gas volumes in the offshore world will need specialized solutions, the same type of approach will be taken especially in shallow waters.

## MIDSTREAM
## STATUS AND BUSINESS OPPORTUNITIES IN MIDSTREAM

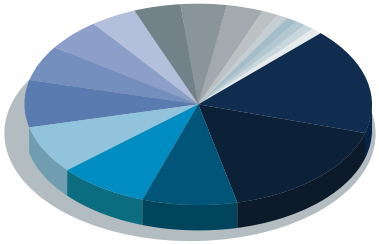
Because of historical reasons, the main storage capacity is still controlled by the combined presence of both Pemex and CFE with over 17.3M BOE (see chart below). Nearly 80 reception and storage facilities and 9 thousand kms of polyducts are absolutely insufficient to solve the storage and transportation needs of the second largest importer of gasolines and diesel worldwide.




Such bottleneck for the retail industry has created a great opportunity for terminal services. Accordingly, in addition to traditional tier-one terminal operators such as Sempra's Ienova, Vopak and Glencore, nearly 70 new projects have been approved by CRE (Mexico's Midstream Regulator).

Should all those projects be built, an additional **4.5M BOE** capacity may be added in US$5B investments. The opportunities in teaming up with potential operators and traders in tackling this market niche is still very attractive.

**Estimated investment in million dollars**



- Tamaulipas (780)
- Veracruz (780)
- Michoacán (404)
- Nuevo León (387)
- Baja California (348)
- Colima (344)
- San Luis Potosi (263)
- Estado de México (230)
- Hidalgo (206)
- Querétaro (199)
- Puebla (197)
- Sinaloa (150)
- Durango (72)
- Yucatán (47)
- Tabasco (46)
- Aguascalientes (45)
- Jalisco (40)
- Guanajuato (19)
- Chihuahua (13)
- Sonora (12)
- Chiapas (1)
- Ciudad de México (0.2)

Considering that the private E&P sector is practically new in Mexico (from 2015) the need to develop midstream infrastructure of all kinds will be vast. Therefore, the opportunities in this chain segment will remain for a long period of time. Not only so for the domestic demand of hydrocarbons, but also for the hub characteristics of Mexico in the region.

## Downstream / Retail

**a. Refining**.

According to the Business Plan presented by PEMEX for 2019-2023, one of the main business lines in the forthcoming years is the refining, processing and marketing of oil, natural gas, petrochemicals and sulfur. Pemex currently has 6 refineries installed, which make up the National Refining System with an installed capacity of 1,540 thousand barrels per day. In addition, PEMEX is 50% associated with Shell at the Deer Park refinery located in the United States of America.

Despite having an installed infrastructure, in recent years the process has suffered considerable falls, such is the case that in 2019 only 620 thousand barrels per day were processed. Thus, one of the objectives of the PEMEX Business Plan is to increase the production of fuels and petrochemicals through the implementation of 3 strategies:

- Expand refining capacity (construction of refinery in Dos Bocas).
- Increase availability and, where appropriate, diversify the sources of raw material for the production of ethylene and its derivatives.
- Strengthen the production of fertilizers.

**b. Modular Refineries**

Within the hydrocarbon production chain in Mexico, refining faces a great challenge, since in recent years more barrels of hydrocarbons have been extracted than are processed, which reflects a wide need for a revitalized refining system.

In recent years, technology has been implemented that has favorably changed the landscape, making the refining business more attractive. This technology is called modular refining. Its implementation in a short time and its ability to locate them in various sites of the Mexican Republic, offer a viable option to meet Mexico's refining requirements.

By mid 2020, the construction of the first modular refinery to be located in Tamaulipas will begin, with an initial refining capacity of 60,000 barrels per day to generate gasoline and diesel, and in future stages it will be able to reach the 110,000 barrels per day mark.

As can be seen, Mexico represents an ideal opportunity for investors and service providers for the installation of modular refineries throughout the country, with the support of the government and protection of its investments.

# SALE TO END USERS

2

Storage needs and the demand for retail sale are directly related. The correlation between both activities generates endless synergies between individuals that allow long-term business relationships.

The investment opportunity focuses on the selection of suitable partners to establish a stable and lasting relationship that generates profits for both parties and satisfies the wide and growing demand of fuels in Mexico.

## MULTIMODAL STATIONS, A NOVEL BUSINESS OPTION.

Multimodal stations are a response to Mexican consumers concerned with the environment and finding spaces that serve the future market of a vehicle fleet with a tendency towards hybrids.

The multiple national and international commitments, as well as the generation of an ecological consciousness within the new generations lead to an inexorable change of the paradigm in the behavior of the consumers.

In 2015, the first multimodal station was inaugurated in the north of Mexico, opening the market for future companies that see this important business opportunity especially in the center of the country, where the sale of hybrid cars has had a considerable increase in the last 4 years.

## MOBILE SERVICE STATIONS.

Another innovative business model, still to be exploited in our country is the construction and implementation of mobile service stations. This energy milestone, suitable for both the densely urbanized and the low populated areas, can respond to the growing demand for oil in various regions of the country.

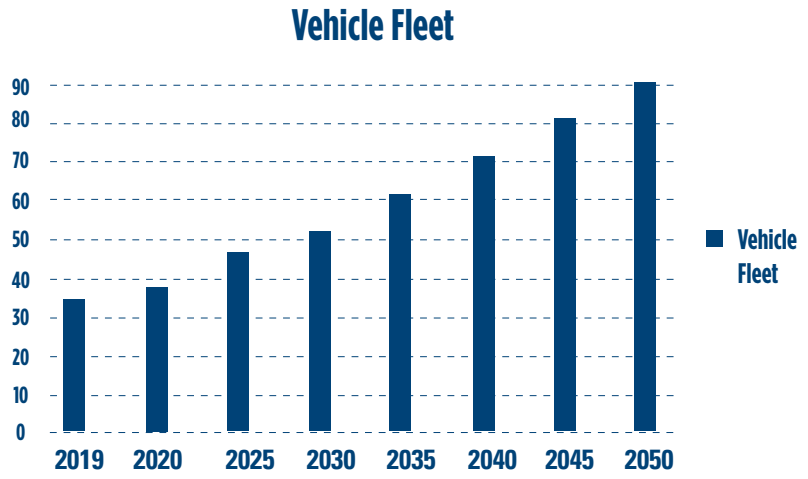
There are currently 12,469 traditional service stations throughout the Mexican Republic distributed as follows:

| State | Service Station | State | Service Station |
|---|---|---|---|
| Aguascalientes | 164 | Baja california | 1592 |
| Baja california sur | 169 | Campeche | 96 |
| Chiapas | 298 | Chihuahua | 565 |
| Ciudad de México | 376 | Coahulia | 441 |
| Colima | 119 | Durango | 217 |
| Estado de México | 1105 | Guanajuato | 667 |
| Guerrero | 219 | Hidalgo | 304 |
| Jalisco | 935 | Michoacán | 472 |
| Morelos | 165 | Nayarit | 163 |
| Nuevo León | 677 | Oaxaca | 245 |
| Puebla | 553 | Querétaro | 303 |
| Quintana Roo | 190 | San Luis Potosí | 265 |
| Sinaloa | 510 | Sonora | 536 |
| Tabasco | 218 | Tamaulipas | 555 |
| Tlaxcala | 117 | Veracruz | 741 |
| Yucatán | 284 | Zacatecas | 208 |

Most service stations are **PEMEX** franchises, however, today there are different brands such as OXXOGAS, Total, Petro-7, Hidrosina, Orsan, Reco, Grupo Eco, Gasmart, Lodemo, Nexum, BP, Chevron, Shell, G500, Gulf, Costco, Repsol that market their products in the national territory, which is a reflection of the potential of the retail market in Mexico.

Modular stations (mobile or semi-fixed) will be a watershed for the current market, due to the reduced time and costs towards its operation.

Below, a forecast for Mexico's vehicle fleet by 2050:




## INVESTMENT OPPORTUNITIES IN NATURAL GAS

**Construction of gas pipelines and infrastructure.**

The demand for natural gas has grown by 32% in the last four years, generating the need to have interconnected gas pipelines to its exploitation areas.

The urgency of certain industries throughout the country lies in the need to get close to the raw material at reasonable prices and with long-term contracts, either on a firm basis and on an interruptible basis.

End users are eager for the incursion of new companies that wish to provide the service continuously and reliably. At present, the main need lies in the construction of transport and distribution pipeline systems throughout the country, with a growing demand in the remote Yucatan Peninsula or Baja California.

In this regard, it is relevant to mention that AMLO's government has initiated procedures to renegotiate contracts with some international companies. These negotiations culminated in agreements beneficial to both parties: while the government ensured a better position, private companies secured a higher consideration.

**Natural gas storage.**

The lack of natural gas storage capacity to meet demand is one of the critical points for the country to maintain an inventory of at least 45 billion cubic feet per day of natural gas, this would be equivalent to the demand of Mexicans to 2026.

Main investment opportunities in the natural gas sector are located in the southern region of Mexico.

The supply of natural gas will be active in the forthcoming years, through sea and land. The CENAGAS will be the responsible entity to inform the need of the supply that will be, primarily, used when the operational conditions on the Sistrangas require it.

## OPPORTUNITIES FOR EXPERT THIRD PARTIES SPECIALIZED IN KEY ASPECTS OF THE HYDROCARBONS SECTOR

Following the creation of various regulatory bodies in the hydrocarbons sector, the figures of expert third parties authorized by the government were strengthened to carry out certain verifications of compliance with specific technical aspects:

This third-party market has increased dramatically in the last 4 years due to the rapid growth of the market and the constant need to endorse new projects.

# ELECTRIC SECTOR

3

In recent years the world has increased its annual electricity demand significantly and Mexico is no exception, the next few years will be vital, as it will face great challenges: the annual demand is expected to increase by 3% annually until 2030, which translates into a doubling of electricity demand in the short term.

According to the CIA World Factbook, Mexico's demand for energy shows a growing pattern. Currently, Mexico is the 91st country in worldwide consumption of energy per capita (well below the world average of 2,000 kwh per capita); nevertheless, it is the 16th country of worldwide overall consumption. Considering the above, the demand for energy per capita is expected to have a rapid growth in the following few years. Currently, the growth rate is estimated in 3% per year.

In contrast, Mexico's power availability is rapidly decreasing. The total annual power availability has shown little to no growth during the last 4 years.

Although the current federal administration has decided to pause the long-term power and energy auctions, it is evident that the urgent need to increase generation will force the government to resume the auctions, or to find alternative manners to obtain new generation.

Considering the limited budget allocations destined to CFE generation plans, the opportunity is shortly to be made available for the best positioned international players: investors, traders, contractors, suppliers, generators, etc.

As noticed, the electricity demand will continue increasing in the following years. Currently, the government is focusing its efforts in increasing and renovating the infrastructure to generate electricity rather than in improving the transmission. This governmental view has been criticized by energy experts because the main issue is in the lack of

access to infrastructure such as transmission network, which is an activity reserved to CFE by the Constitution, in other words no private investment is allowed. Despite the efforts of the current government, CFE will not be able to conduct by itself generation and transmission activities enough to cover the critical hours of high consumption of electricity.

The above-mention presents an opportunity to all the companies that are willing to participate in the bidding processes issued by CFE to renew the transmission network and ageing plants and power stations.

After the Energy Reform of 2014, the market was liberalized with respect to the generation and supply of electricity. The new market structure allows energy consumers to meet their electricity needs from a range of available options, thereby ending the monopoly of the Federal Electricity Commission (CFE), which is now only one more participant of the market.

In that sense, the Wholesale Electricity Market (WEM) was designed to allow participants to sell and buy electricity, power, clean energy certificates, related services and financial transmission rights for the proper functioning of the National Electric System (SEN) .

## CLEAN ENERGY CERTIFICATES

Recent amendments to local rules, have been controversial as to the potential affectations that the Clean Energy Certificates market (Renewables Obligations) will suffer.

It is no secret to Mexico, that the Clean Energy Certificates model has proven a limited (short) period of success in other jurisdictions. While some entities are assessing to initiate legal actions from the potential -and currently unquantified and undefined- financial losses that the regulatory changes may have had, some other private players have started to analyze and structure mid and long term business plans towards the forthcoming implementation of other energy financial markets, such as the CfD (Contracts for Difference) or the UK's Premium Models, based on the reduced risk allocation for the generator.

## ELECTRIC AUCTIONS

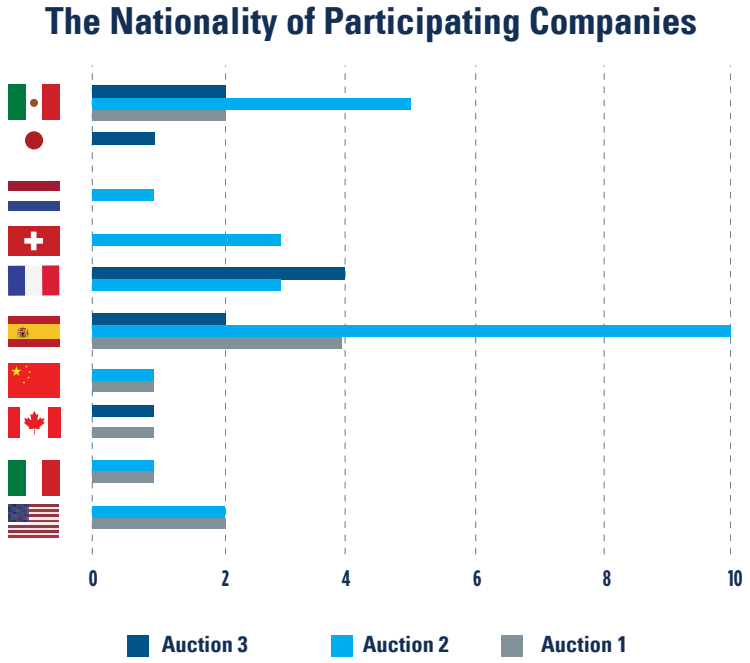
We can describe auctions as tenders where different generators compete to sell energy to the large customers: CFE and private end users.

There are two types of auctions:

a. i) Long term.- Reserved for clean technologies and offer new and existing generation projects a stable income of 15 to 20 years.

b. ii) Medium term.- They refer to energy and power products that will be offered by the generators for a period of 3 years.

The three auctions that have been held in Mexico were in 2015, 2016 and 2017, where various companies of different nationalities participated, as described below:



Current status of the awarded projects is described below:

| Project | First Auction | Second Auction | Third Auction | Total |
|---|---|---|---|---|
| Power plants approved | 17 | 24 | 15 | 56 |
| In operation | 6 | 4 | 0 | 10 |
| In construction | 11 | 15 | 0 | 26 |
| To start construction | 0 | 4 | 15 | 19 |
| Committed investment (million of dollars) | 2766 | 4404 | 2841 | 10011 |
| Executed investment (millions of dollars) | 1596 | 280 | 0 | 1876 |
| Commited capacity (MW) | 2014 | 3056 | 2596 | 7666 |
| Capacity in operation (MW) | 1255 | 337 | 0 | 1592 |
| Allocation date | 2015 | 2016 | 2017 | |
| Committed start date | 2018 | 2019 | 2020 | |

## SALE OF ASSETS SECONDARY MARKET FOR ELECTRIC SECTOR PROJECTS.

Just as in different countries with a mature energy sector, Mexico is entering into a new phase, after long term projects were awarded. Some of the awardees have entered into highly profitable agreements to sell (totally or partially) their participation in the awarded projects.

Following a successful thread of awards, Enel closed an agreement with Caisse de dépot et placement du Québec (CDQP) for the sale of 80% of the capital of eight SPVs each awarded with a contract in Mexico with a total capacity of 1.8 GW.

The transaction was also carried out using the "Build, Sell and Operate" ("BSO") model, which allows the portfolio of renewable energy projects to be capitalized more quickly and accelerates the creation of value for all parties.

**Short term market.** Also called real-time merchant. This market adjusts the estimated demand of the day market in advance from the demand in real time, allowing the participants to present hourly offers of purchase and sale of energy and related services, at least fifteen minutes before each hour of operation.

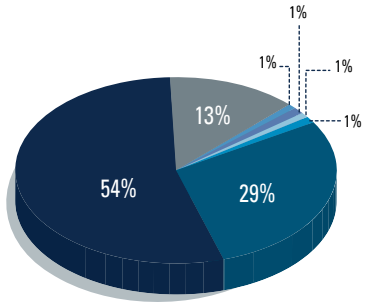
**Sale one day in advance.** It allows generators and suppliers to acquire energy and associated products in order to balance their long and medium term demand estimates based on their revised short term estimates.

## DEVELOPMENT OF THE ELECTRIC SECTOR

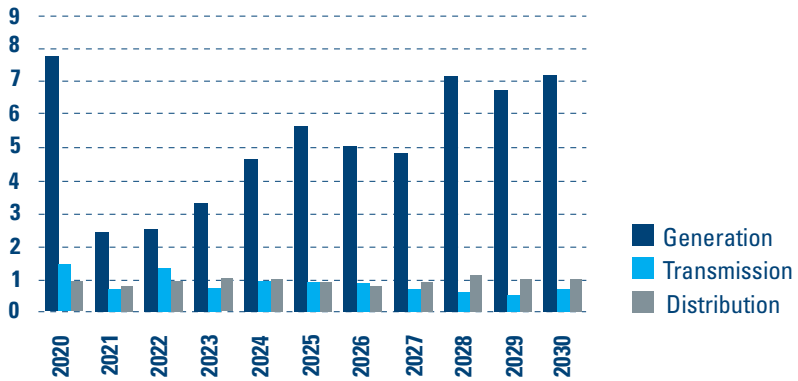
Since January 2016, the energy reform has created a market made up of independent generators, suppliers and other relevant players.

The WEM has grown considerably since its inception in 2016: up to December of 2019, it had 96 generators, 51 qualified service providers, 2 basic service providers, 1 intermediation generator, 2 qualified users, 2 suppliers of last resort and 22 non-supplier marketers giving us a total of 176 participants, in just 3 years the market grew 10 times since its inception, which fosters an environment of greater competition.

### Wholesale Electricity Market participants 2019




During the next 10 years, an estimated investment of $ 81.4 billion in the generation ($ 61.8), transmission ($ 9.3) and distribution ($ 10.3) of electrical energy is foreseen, as can be seen in the following graph:




## ELECTRIC POWER GENERATION AND CLEAN ENERGY

Mexico has a transition strategy to promote the use of cleaner technologies and fuels as a national security principle, which aims to guarantee everyone's access to affordable, safe, sustainable and modern energy. To achieve this, it is necessary to produce science, technology, equipment, capital goods and new industries, all with the support of the public, social and private sector of the country, which would increase their participation in the national energy matrix.

Among the main energy offers from competitive renewable and clean energy applicable to Mexico we can find: wind energy that has reduced its plant installation cost by more than 60%; photovoltaic solar energy that had a reduction of more than 90% in 30 years for its generation; the ocean energies due to waves, tides, salinity or thermal conversion between 2010 and 2018, growth of installed capacity worldwide from 250 MW to 532 MW; the geothermal energy that has an installed capacity between 2010 and 2018 went from 9,998 MW to 13,329 MW internationally; Bioenergy, which represents almost 10% of total final energy consumption and represented 1.4% of electricity generation in 2015, also, between 2010 and 2018, installed capacity increased from 67,929 MW to 115,731 MW in the world; and finally, efficient cogeneration that has increased in small applications for the commercial and services sectors.

In recent years, more than 329,000 GWh of electrical energy have been generated, with respect to which 78.9% of the electricity generated comes from conventional technologies and the remaining 21.1% from clean technologies.



In turn, 50% of the generation comes from combined cycles, 13% from conventional thermal, 9% from coal-fired power and 10% from hydroelectric.

Likewise, 76.9% of the clean generation comes from hydroelectric (45.9%), nuclear (15.7%) and wind (15.3%), while 81% of the electricity generation from conventional technologies comes from combined cycle plants ( 63.6%) and conventional thermoelectric plants (16.5%).

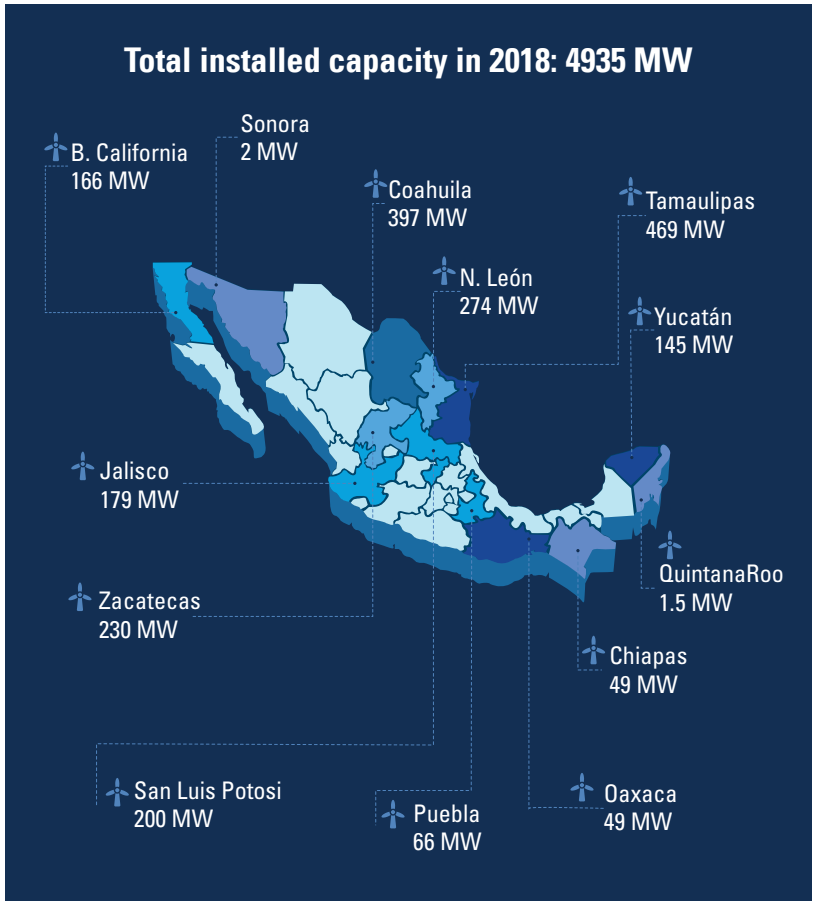
## THE FUTURE OF SOLAR ENERGY IN MEXICO.

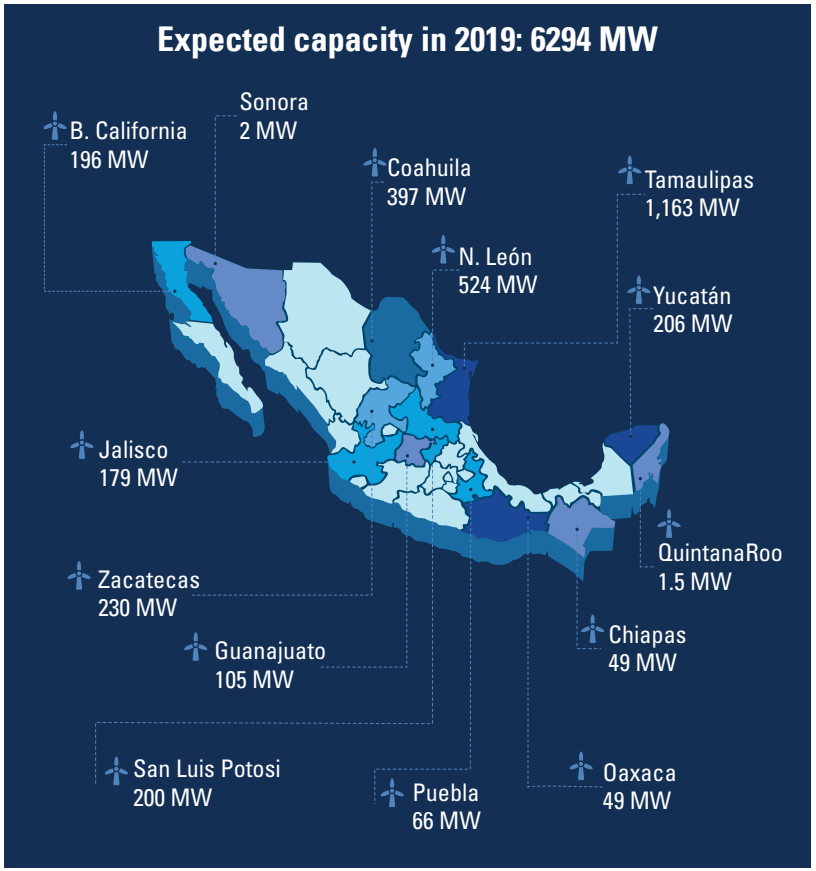
Mexico is an ideal country for the implementation of solar energy, both in solar parks and for distributed generation, given that 70% of our territory has an irradiation of more than 4.5 kWh / m2 / day, which makes it a solar paradise.

The Solar Power Europe indicated that Mexico has an important area of opportunity to develop solar energy being able to become an international power in 5 years, even becoming the seventh largest electricity generator in the world by adding 20 GW in a positive scenario or 7.9 GW under a conservative scenario until 2022. Additionally, it places it in the ninth place in the main prospects to generate capacity, its best scenario is that by 2022 there will be an average capacity of 15,252 with an annual compound growth rate of 67%.

## GROWTH OF WIND ENERGY.

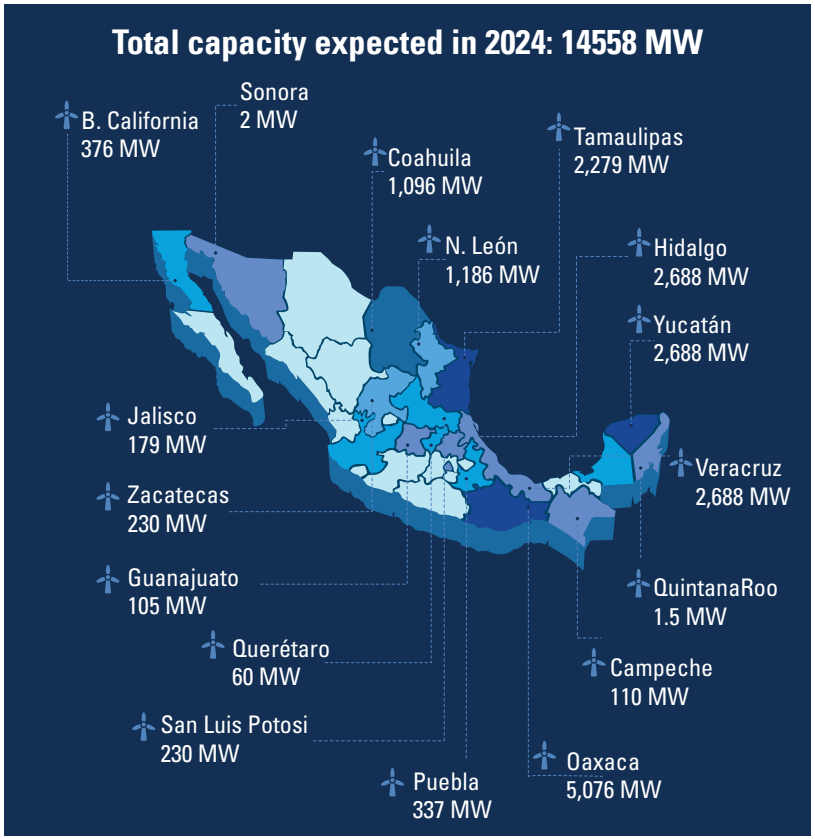
Wind power currently supplies more than 3% of global electricity consumption and it is expected that by 2020 it will exceed 5%. In the longer term (2040), the International Energy Agency foresees that this type of energy can cover 9% of the world's electricity demand.




Mexico, as the signing country of the Kyoto Protocol, bases its strategy for the next few years on the use and diversification of clean energy and, by 2025, wants to increase the share of renewable technologies by around 35% of installed capacity .

The continuous increase in electricity demand and the public administration's commitment to the transition of hydrocarbons to alternative sources have led Mexico to position itself as a country of opportunities for the development of the renewable energy sector and, especially, in the wind sector, so it is expected that by 2024 the generation of energy will increase to 14,558 MW in 18 states of the Mexican Republic.




## COMBINED CYCLE

In Mexico, electricity generation predominates from combined cycles. The current federal administration initiated with 83 power plants with a total installed capacity of 28,084 MW equivalent to 37% of the national installed capacity.

The generation process in combined cycle plants is similar to that of gas turbine plants, with the difference that the turbine exhaust gases are used in a recovery boiler to generate steam and drive a turbine in a process similar to of conventional thermal power plants.

PEMEX currently has 196 onshore extraction assignments, and there are 48 land contracts awarded to individuals, which is equivalent to 244 business opportunities by installing a combined cycle power generation plant.



These power generation plants in turn have two business opportunities:

- Carry out its interconnection to the National Electric System to commercialize electric energy through the wholesale electricity market.
- Do not carry out the interconnection and use the energy generated in another industrial process.

It is important to mention that the investment in combined cycle projects has been very attractive for the private initiative, so much so that Iberdrola will begin the construction of a combined cycle plant in Veracruz in which it will invest, 750 million dollars, and plans to invest up to 5,000 million dollars in the period 2019-2024.

The foregoing, in addition to the 450 million dollars previously invested in the construction of its combined cycle plant in El Carmen, whose energy will be destined for the sale of industrial customers in the WEM.

## DISTRIBUTED GENERATION AS A TAILORED SOLUTION.

The distributed generation consists of the generation of electric power through small power plants with a capacity of less than 0.5 MW, which is interconnected to a distribution circuit and in terms of market rules contains a high concentration of load centers. In terms of market rules, these small power plants can also operate with renewable energy such as solar panels installed on the roofs of houses or small wind farms.

With approximately 43 million 420 thousand users of electricity, Mexico has great potential for the distributed generation market. This translates into the feasibility of 40 million users interconnecting under the netbilling model and 4 million 320 thousand doing so under the net metering category, minus the 100 thousand that are already connected.

## THER BUSINESS OPPORTUNITIES IN THE ELECTRIC SECTOR.

**Private auctions**

Although the Mexican government announced that at the moment the long-term auctions were not going to resume, private companies are organizing long-term auctions among the same companies.

In October 2019, 70 participants registered to participate in the first ever private conducted long term auction. In this first auction, estimations round the 240 million dollars figure and 745 MW for all-new generation plants.

## ELECTROMOBILITY

Parallel to the development in the electric sector, it is sought that certain projects such as electromobility in Mexico will be promoted and developed with the help of private investment.

The National Commission for Efficient Energy Use together with the Copper Association (ICA, for its acronym in Spanish) elaborated the "Strategic Plan of the Alliance for Electromobility in Mexico". The Alliance is a public and private initiative that is conformed by organizations that seek to develop alternative public, private or international financing schemes to apply to programs for the replacement of official and public transportation vehicles powered by fuel engines, by electric engines.

Electromobility is also contemplated in the Special Program for Energy Transition 2019-2024 to be presented by SENER by end-March. As said, the main purpose of the Program is to establish the public policy to be performed in order to meet the goal set forth in the Energy Transition Law. The government is aware of the need to promote the private investment to endow cleaner technologies for public and private transportation.

That is why Mexican Local Governments, specially from Mexico City, Guadalajara and Monterrey are opening the door to private investors in electromobility, focusing initially in public transportation and infrastructure, based on the reasons that electric vehicles can be 60-70% more profitable than fuel-based ones.

For example, Mexico City, Guadalajara and Monterrey's Governments have been changing his public transportation vehicle fleet (busses, cabs, and subways) with electric ones, and will continue doing so, with an investment of approximately 3 billion dollars.

Also, because of the increase in hybrid and electric private car sales, foreign companies such as SHELL and GULF are investing in electric cars charging stations. That is why, since 2015 the construction and operation of electric cars charging stations has triplicated. Currently, in Mexico exist more than 900 electric charging stations, number that will increase in the following years.



## UNITED STATES-MEXICO-CANADA AGREEMENT (USMCA)

Energy is one of the Mexico's largest exports ranking behind only motor vehicles and machinery in dollar terms. That is why with the USMCA, investments in the oil and gas sector, an electric power production will continue to be protected by including in Chapter 14, the Investor-State Dispute Settlement protection, that not only contemplates national treatment, and protection against direct expropriation, but also against indirect expropriation. Exhaustion of local remedies requirement does not apply to energy.

It is important to indicate that the technical barriers to trade indicated on Chapter 11 of the USMCA applies to any amendment of government authorities that may affect "trade in goods between the parties". In other words, changes in technical regulations require that preference be given to international standards and that parties provide a written explanation of any other standard used, emphasizing that said preference seeks to avoid regulations that unduly restrict trade. That is why, in the unlikely event that president AMLO would roll back the current oil and gas laws, the technical barriers to trade will be a legal procedural obstacle.

Moreover, some of the general provisions that will help the energy trade are:

a. The existence of zero tariff trade in Energy Products between Mexico, U.S. and Canada.

b. Fixes a longstanding issue in allowing hydrocarbons transported through pipelines to qualify as originating, provided that any diluent, regardless of origin, does not constitute more than 40 percent of the volume of the good.

c. Provides new flexibilities in rules of origin certification requirements for oil and gas moving between the United States, Mexico and Canada.

GOODRICH
RIQUELME
ASOCIADOS

# ENERGY PRACTICE

As one of the top full service Law firms in Mexico with more than 85 years of experience and over 200 professionals and staff members, Goodrich remains a renowned and respected actor of the Mexican law environment. Ranked in highest tiers in the Energy sector (Chambers & Partners, Legal 500, among others), Goodrich does not only advice and represent companies for energy deals but also accompanies its clients through all the steps of their ventures providing them thoroughly processed and far-reaching proposals in various practice areas.

**For further information please contact:**


**David Enríquez**
denriquez@gra.com.mx

**Jorge Sandoval**
jsandoval@gra.com.mx


**www.goodrichriquelme.com**

GOODRICH
RIQUELME
ASOCIADOS