



Mexico's Energy Regulatory Commission: Challenges and Opportunities in Reforming the Energy Industry



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Chairman

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Panama



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“In terms of scope, depth and space of implementation, Mexico’s energy reform ranks as the most ambitious energy system transformation worldwide in a long time”

Paul Simons, International Energy Agency (IEA), Deputy Executive Director (February, 2017)*



The Energy Reform ended the long-decades monopolies in the sector



Interest (trust) shown by international investors



Incorporates lessons learned and best international practices



Will boost oil production, increase the share of renewable energy sources and increase energy efficiency

The International Energy Agency's special report "Mexico Energy Outlook" compares the estimated benefits of the Energy Reform by 2040, with a No Reform scenario



NO REFORM

REFORM

Oil production would be around **1 mb/d** lower than in the Reform scenario



Oil and gas **production** will increase and petroleum product imports will decrease

Electricity rates for industrial consumers would be **14% higher** in 2040



Lower electricity rates for industrial consumers

The cost of generating and delivering electricity to the residential sector would be **16% higher**; the additional accumulated subsidy would be 50 billion dollars



Subsidies will be gradually **phased out by 2035**

Mexico would not meet its **clean energy targets**, nor its GHG emissions reduction goals



Mexico will meet the **35% clean power generation** target by 2024 and reduce its GHG emissions

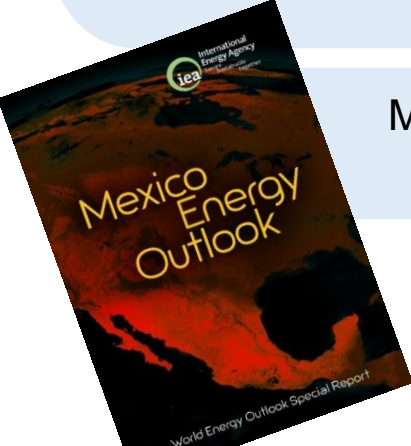
Mexico's economy would be **4% smaller**



Mexico's economy will double, it will be more efficient and its **energy intensity will improve**



Energy efficiency standards will significantly decrease Mexico's energy consumption



Mexico's landmark Energy Reform is now a reality, creating significant investment opportunities throughout the entire value chain



Estimated Investment:
242 billion dollars



Committed Investment:
70 billion dollars
(30 billion more in 2017)



Hydrocarbons

“Rounds One and Two”

Round 1:

- 1st Tender: **2.7 billion USD**
- 2nd Tender: **3.1 billion USD**
- 3rd Tender: **1.1 billion USD**
- 4th Tender: **34.4 billion USD**
- Trión: **11 billion USD**

Round 2:

- 1st Tender: **11.3 billion USD**
- 2nd Tender: **5.0 billion USD**
- 3rd Tender: **1.0 billion USD**
- Seismic data: 2.5 billion USD**

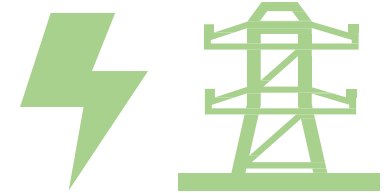


Natural Gas and Petroleum Products

Gas pipelines: **16 billion USD**

Petroleum Products: **16 billion USD**

- Transportation and Storage: **4.0 billion USD**
- Distribution and Retailing: **12.0 billion USD**



Power Sector

First Power Auction: **2.6 billion USD**

Second Power Auction: **4.0 billion USD**

Generation: **98.7 billion USD ***

Transmission: **15.3 billion USD ***

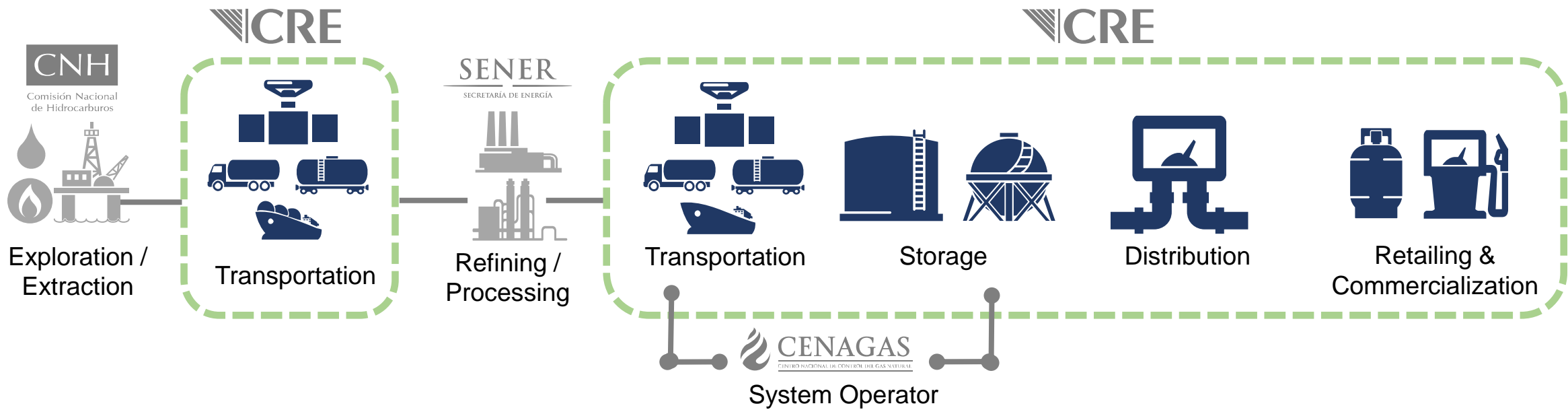
Distribution: **17.7 billion USD ***

A total of **82 companies** from **18 countries** have won contracts for the development of hydrocarbons and electricity projects

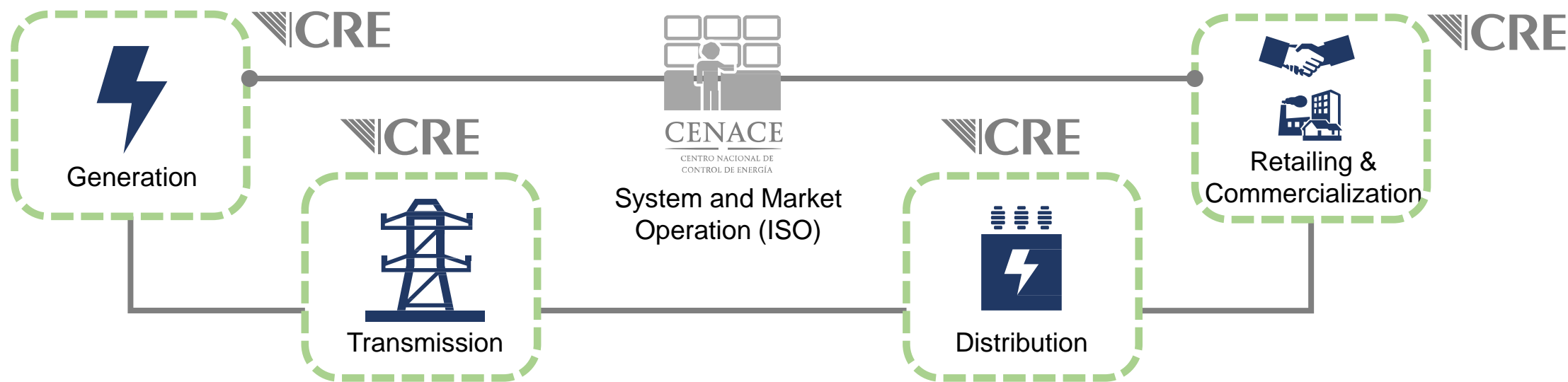
The Energy Regulatory Commission (CRE) has become the regulator of the mid and downstream segments of the oil and gas value chain, as well as the electricity supply chain



Hydrocarbons



Electricity



The energy reform laid the foundations for an open and competitive natural gas market



1. Enhance
natural gas
availability
throughout the
country



2. Separate
pipeline transportation
from natural gas
commercialization



3. Establish
open access and
pipeline capacity
reserve conditions



4. Issue
asymmetric regulation
for high market
concentration and in
case of price
distortions (First-Hand
Sales in the south,
gas release program)

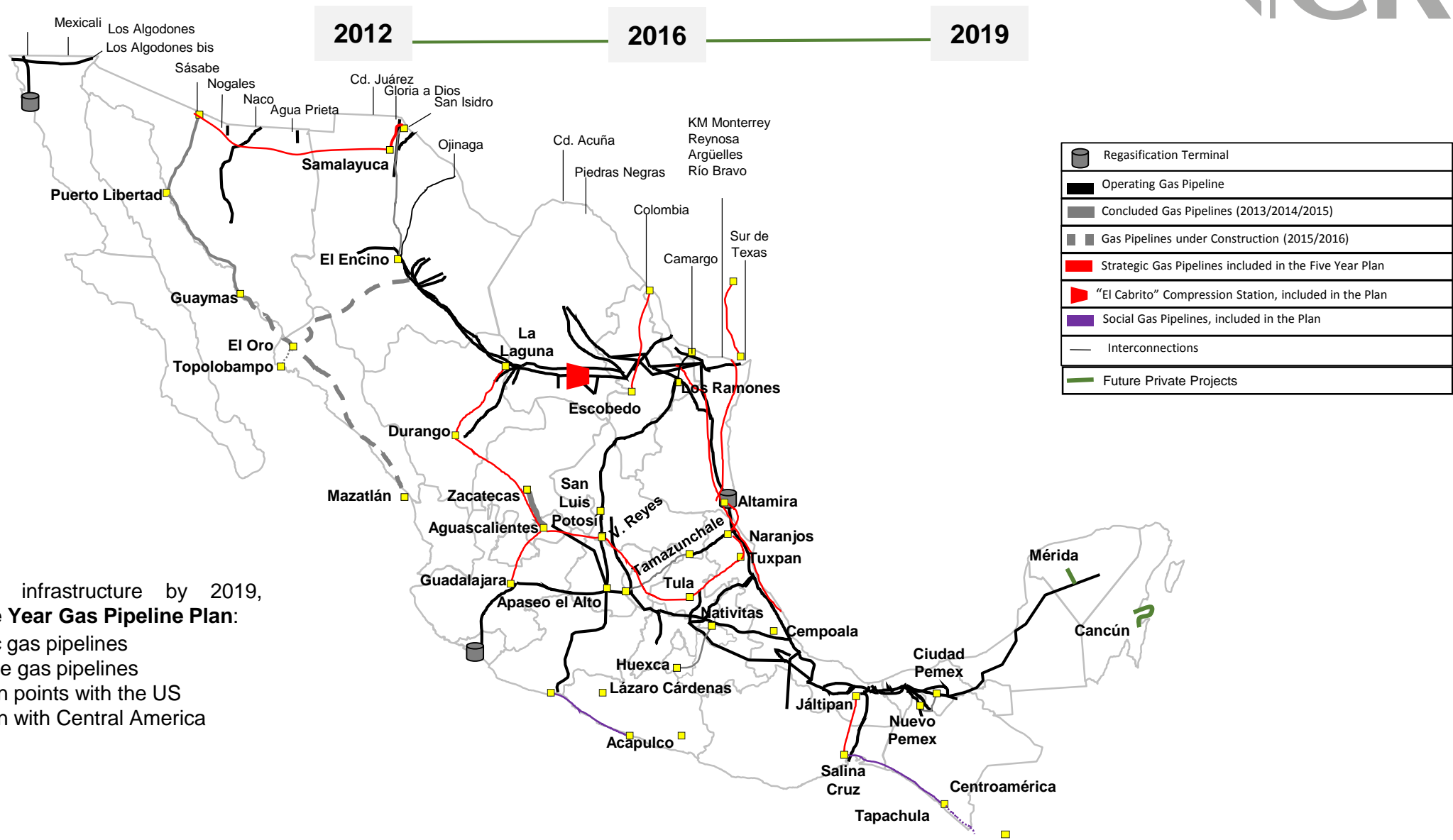


5. Publish
volumes, prices, discounts,
locations and trade
information for retailing and
commercialization of natural
gas

Mexico's Gas Pipeline Network will expand considerably from 2012 to 2019



Total expected investment
16
billion dollars



New transportation infrastructure by 2019, according to the **Five Year Gas Pipeline Plan**:

- 10 new strategic gas pipelines
- 2 social coverage gas pipelines
- 7 interconnection points with the US
- 1 interconnection with Central America

*Participation of American and Canadian capital in Mexico's Gas Pipeline Network

Geographic Areas of Natural Gas Distribution*



Total investment**

1,847
Million dollars

Pipeline network

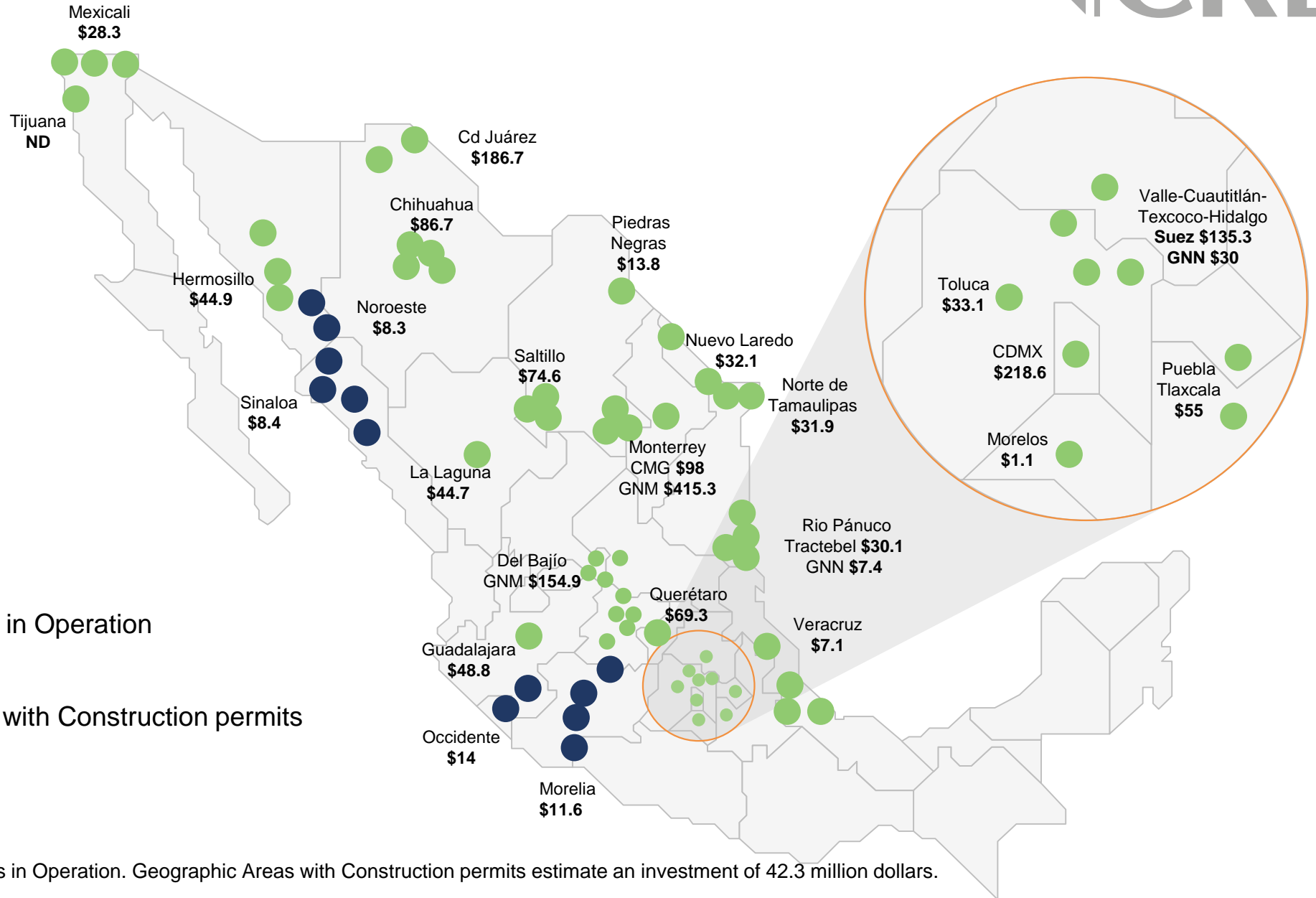
52,818
kilometers



Geographic Areas in Operation



Geographic Areas with Construction permits



*/ Units in million dollars (USD)

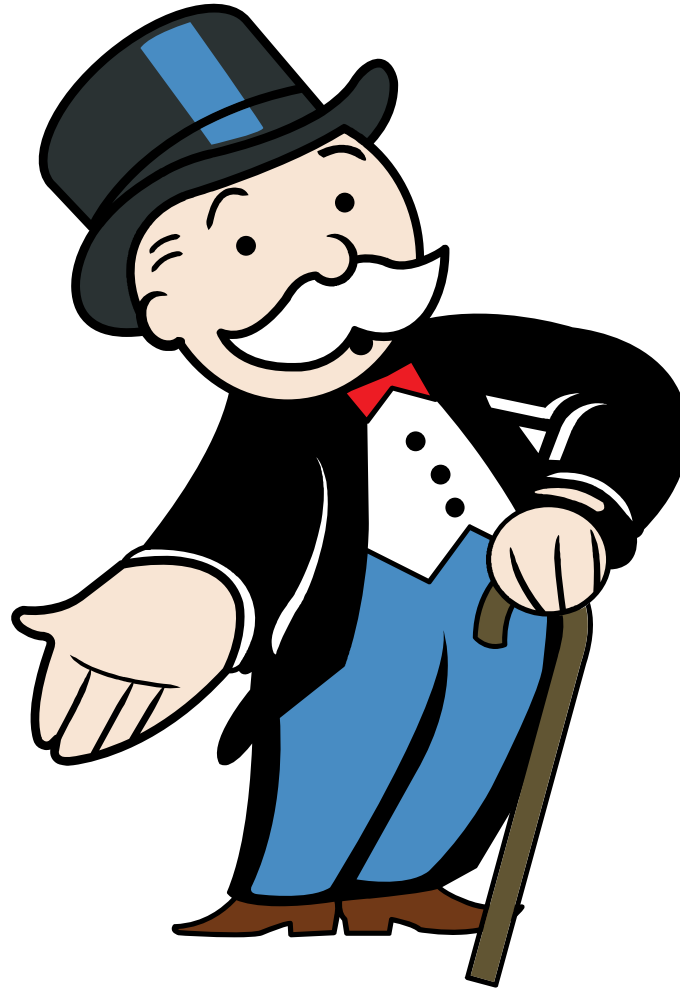
**/ Investment corresponds to Geographic Areas in Operation. Geographic Areas with Construction permits estimate an investment of 42.3 million dollars.

The distribution of natural gas has been considered a natural monopoly. However, if the relevant market is defined as the consumption of energy, we observe that it doesn't have most of the characteristics of a monopoly

~~Single supplier~~

~~No substitutes~~

~~No competition~~



~~Price control: possibility to set the level and discriminate~~

~~Barriers to entry for competitors~~

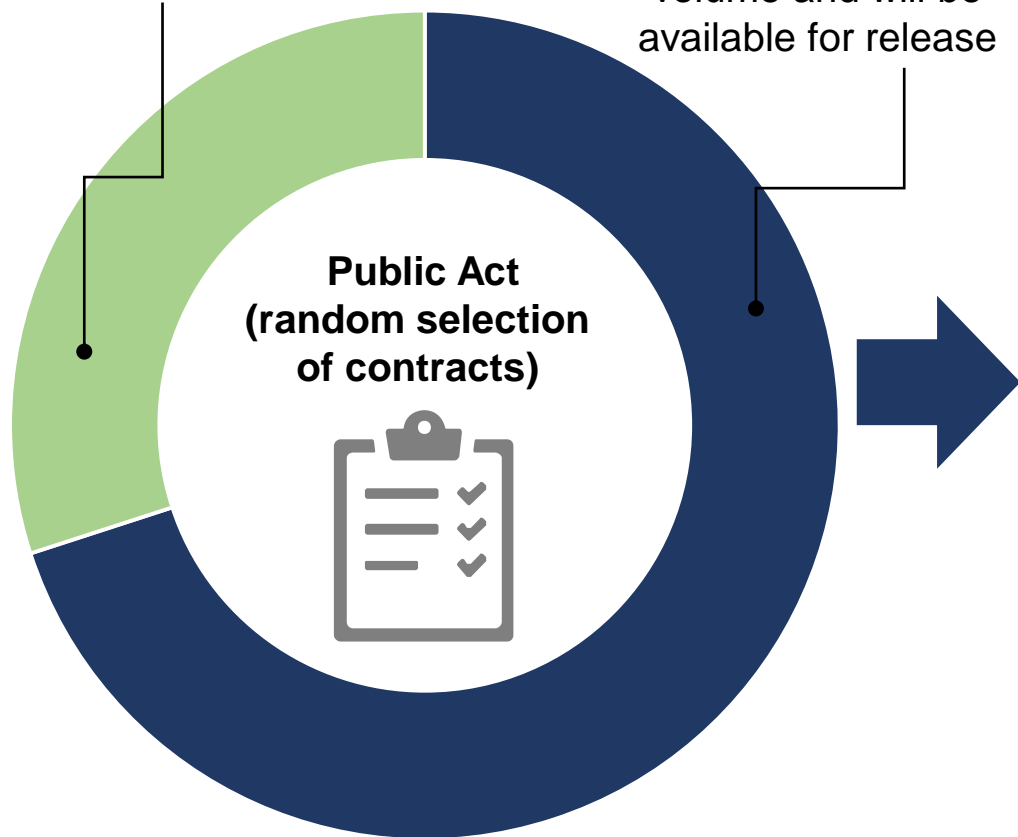
Economies of scale

The Gas Release Program, an asymmetrical regulation instrument to Pemex, seeks to promote the participation of new stakeholders in the industry

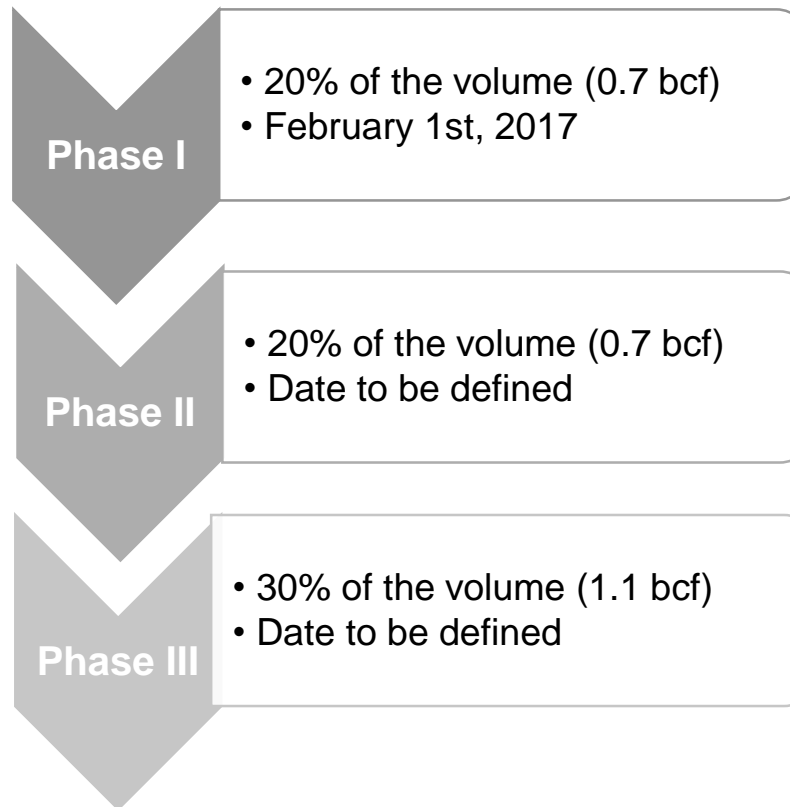


Contracts that represent **30%** of the volume and will remain as customers of Pemex

Contracts that represent **70%** of the volume and will be available for release



Release portfolio: approximately 2.5 bcf



- ✓ Process duration: at least one year
- ✓ CRE will be able to merge Phase II and Phase III and reduce the time-lapse between them

Total commercialization portfolio: approximately 3.6 bcf

Deadline for the reception of applications: March 10th, 2017

OUTCOMES OF PHASE 1:

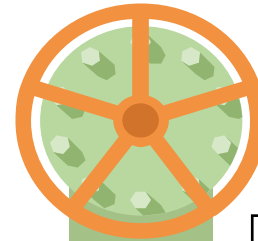
- **Contracts subject to release:** 111 contracts (758 Mcf)
- **Contracts that remain with Pemex:** 133 contracts (1,104 Mcf)

On February 17th of 2017, CENAGAS executed the first annual auction of import pipelines' capacity. A total capacity of 718 Mcf/d was offered, of which, 29.2% (210 Mcf/d) was allocated

Results

Fábrica de Envases de Vidrio de Potosí

Requested injection point:
NET ETP – Delmita Los Ramones
Requested capacity : 3.96 Mcf/d
Overprice offered: 1.05 USD/Mcf
Granted capacity: 3.96 Mcf/d



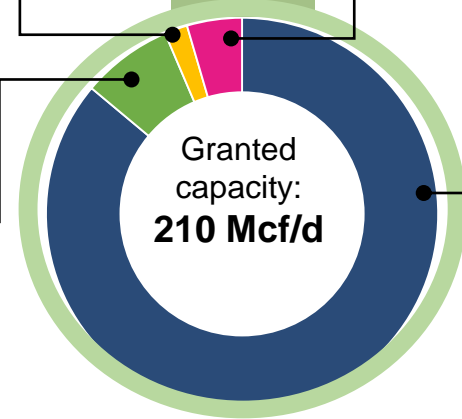
BP Energía de México

Requested injection point:
NET DCP-Gulf Plais Los Ramones
Requested capacity: 9.52 Mcf/d
Overprice offered: 0.01050 USD/Mcf
Granted Capacity: 9.52 Mcf/d



Industria de Alkali (Grupo Vitro)

Requested injection point:
NET ETP – Delmita Los Ramones
Requested Capacity: 15.79 Mcf/d
Overprice offered: 0.00000 USD/Mcf
Granted Capacity: 15.79 Mcf/d



BP Energía de México

Requested injection point:
NET EFM –Nueces – Los Ramones
Requested capacity: 181 Mcf/d
Overprice offered: 0.01050 USD/Mcf
Granted Capacity: 181 Mcf/d

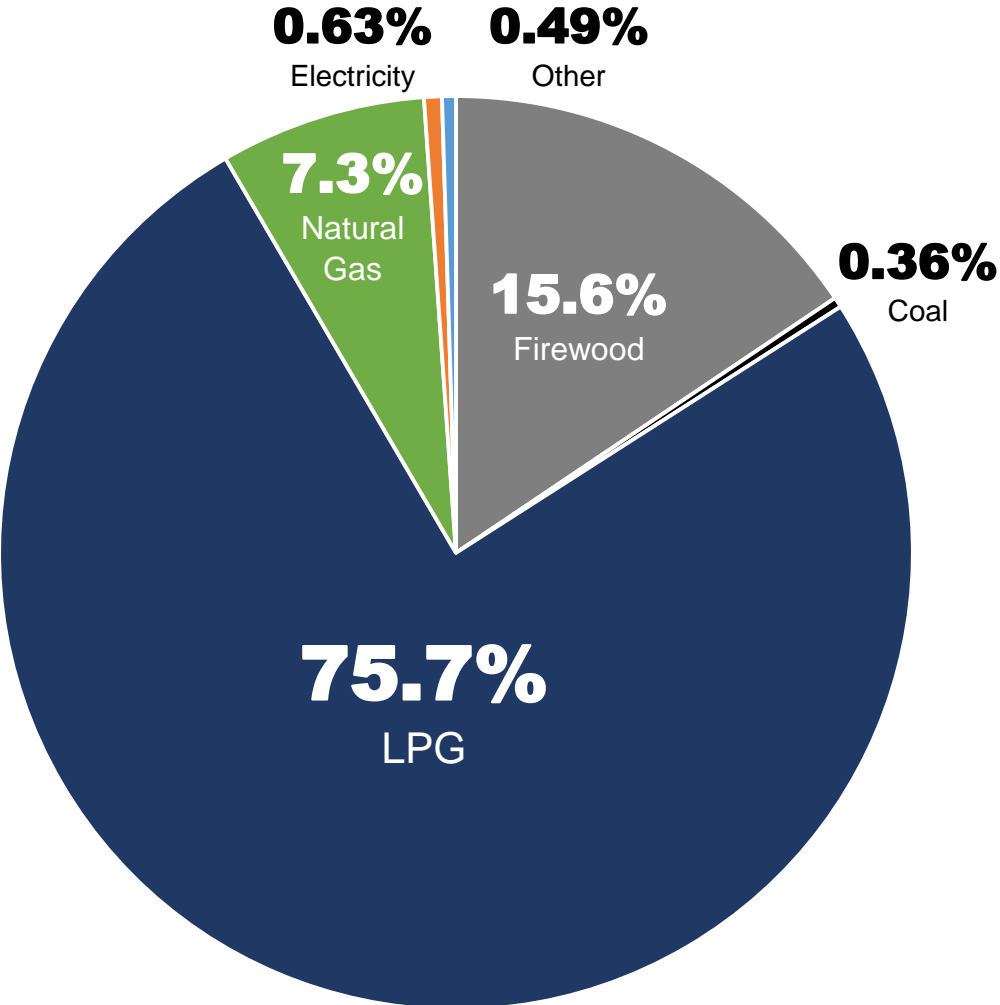


The awarded contracts will be **valid from July 1st, 2017 to June 30th, 2018**

As a result of this process, BP, the largest natural gas trader in North America, begins its participation in the national market. Also, Mexican industries have begun to diversify their portfolio options to satisfy their supply needs

*Mcf/d: one million of cubic feet per day

76% of Mexican households use Liquefied Petroleum Gas (LPG) as the main fuel for cooking and water heating, followed by firewood with 16% of households



| Social Lagging Indicators | Share of Households |
|--|---------------------|
| Unavailability of power | 1.0% |
| Earthen floor | 3.5% |
| Unavailability of tap water from the public grid | 5.1% |
| Unavailability of drainage | 6.0% |
| Firewood Use | 15.6% |

The **government** has various **tools** to **promote a competitive environment** in the LP Gas industry

1. **Provide** accurate and timely Information + transparency
2. **Incorporate** storage capacity with open access
3. **Establish** new forms of distribution
4. **Encourage** the replacement of firewood with LPG
5. **Deregulate** LPG prices by 2017

Source: Encuesta Nacional de Ingresos Gastos de los Hogares (ENIGH), 2014 and CONEVAL 2015.

Prior to the Reform, Mexico's fuel retail model generated significant inefficiencies:



Fixed Price Regime

- National single price (prevented adequate cost recognition on a regional basis)
- Fluctuations of international prices were reflected with a delay
- Lack of efficient price signals resulted in underinvestment throughout the value chain
- The excessive subsidy benefited the population with the highest income (200 billion pesos per year)



Pemex did not recover logistical costs

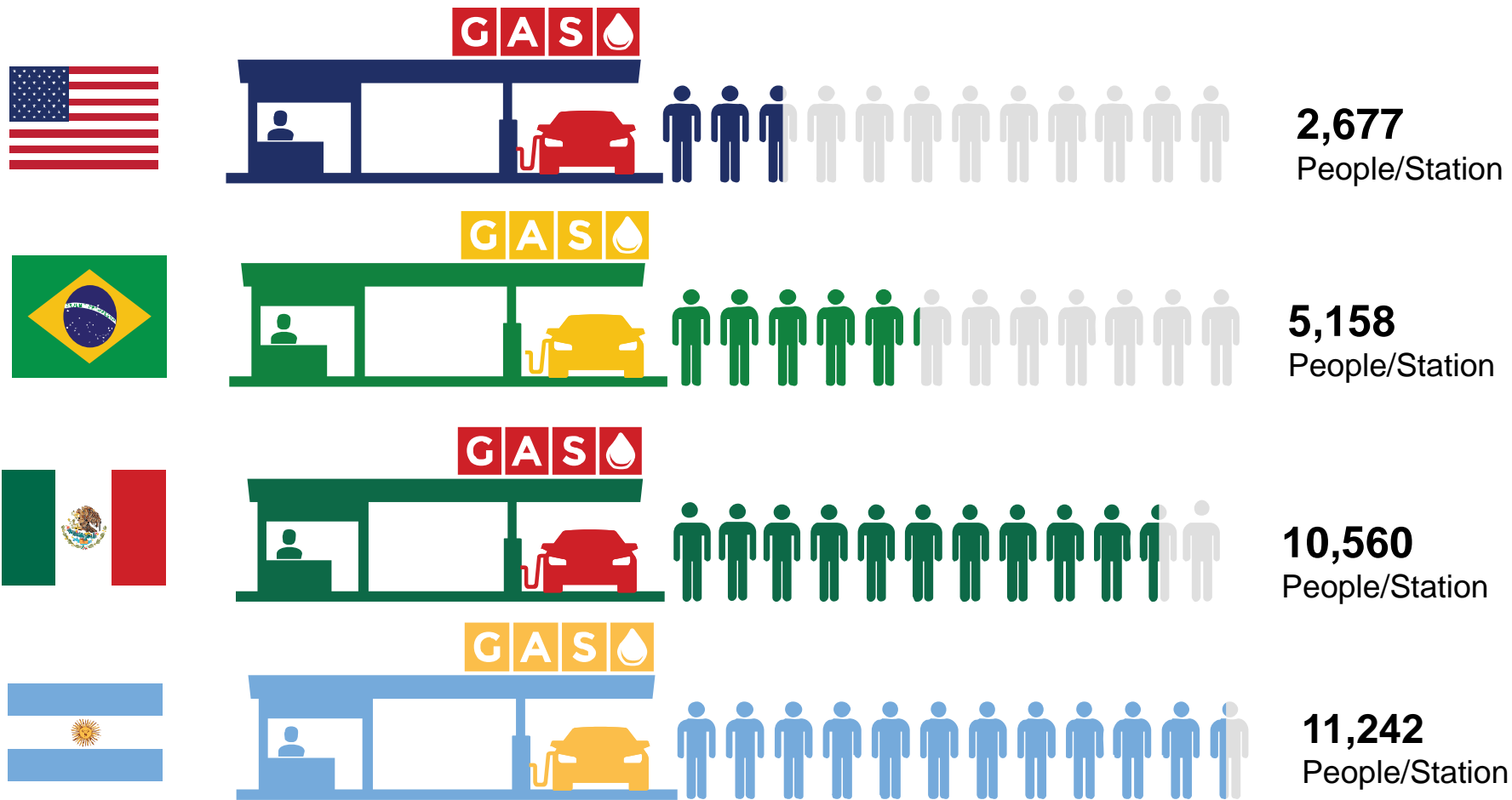
- Pemex lost resources for unacknowledged logistical costs in the overall gas price



Underinvestment in the industry

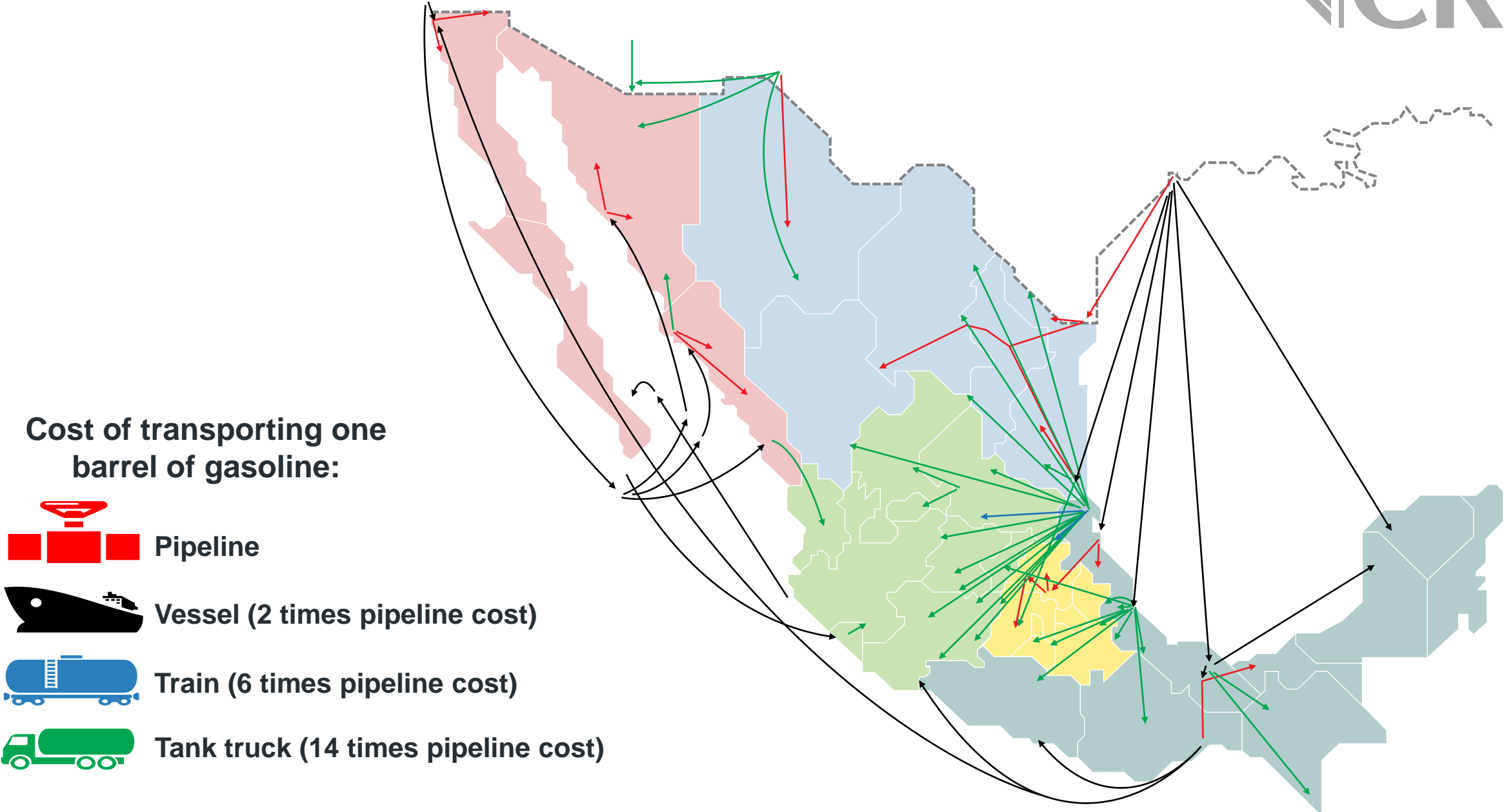
- Limited infrastructure: low capacity and vulnerability (extreme weather events)
- Lack of incentives to improve service quality in gas stations
- 40% of municipalities do not have gas stations

Fuel price flexibility will trigger significant investments and create new jobs at the retail level. Also, it will enhance fuel availability and supply security for consumers



Represents
1,000 people

Logistical routes for imports and supply of gasoline in Mexico



Fuel price liberalization strategy in Mexico



\$ Price Liberalization

\$ **MAR-30th-2017**

- Baja California
- Sonora

\$ **OCT-30th-2017**

- Baja California Sur
- Durango
- Sinaloa

\$ **NOV-30th-2017**

- | | | | |
|--------------------|--------------|-------------------|-------------|
| • Aguascalientes | • Guanajuato | • Morelos | • Oaxaca |
| • Ciudad de México | • Guerrero | • Nayarit | • Tabasco |
| • Colima | • Hidalgo | • Puebla | • Tlaxcala |
| • Chiapas | • Jalisco | • Querétaro | • Veracruz |
| • Estado de México | • Michoacán | • San Luis Potosí | • Zacatecas |

\$ **JUN-15th-2017**

- Chihuahua
- Coahuila
- Nuevo León
- Tamaulipas
- Municipio de Gómez Palacio, Durango

\$ **DEC-30th-2017**

- Campeche
- Quintana Roo
- Yucatán



The opening of refined product logistics (gasoline, diesel and jet fuel) has triggered the interest of new investors in the energy sector



Investment: 1.3 – 2.3 billion dollars

Monterra Polyduct

- **Route:** Tuxpan, Veracruz - Tula, Hidalgo
- **Project:** 1 storage terminal and 1 polyduct
- **Diameter and length:** 18 inches and 270 Km
- **Operational capacity:** 100 thousand barrels per day
- **Will transport:** gasoline, diesel and jet fuel
- **CRE's approval (TA):** March 22, 2016
- **Final ruling:** July 1, 2016
- **Opening:** Second half of 2018
- **Estimated investment:** 600 million USD

Polyduct INI4

- **Route:** Tuxpan, Veracruz — Tizayuca y Tula, Hidalgo
- **Project:** 3 storage terminals, 1 polyduct and 3 pumping stations
- **Diameter and length:** 24 inches and 265 Km
- **Operational capacity:** 140 thousand barrels per day
- **Will transport:** gasoline and diesel
- **CRE's approval (TA):** March 22, 2016
- **Final ruling:** 20 working days after the deadline for receipt of applications
- **Opening:** First trimester of 2018
- **Estimated investment:** 350 million USD



Frontera-Norte Polyduct

- **Route:** Corpus Christi, Texas — Nuevo Laredo, Tamps. — Santa Catarina, Nuevo León
- **Project:** 4 storage terminals and 1 polyduct
- **Diameter and length:** 12 inches and 242 Km (USA) and 218 Km (Mexico) = 460 Km
- **Operational capacity:** 90 thousand barrels per day
- **Will transport:** gasoline, diesel and jet fuel
- **CRE's approval (TA):** March 10, 2016
- **Final ruling:** May 23, 2016
- **Opening:** First trimester of 2018
- **Estimated investment:** 500 million USD



- **Route:** Tuxpan, Veracruz – Central Mexico
- **Project:** 1 marine terminal, 1 polyduct and 1 inland storage and distribution hub
- **Length:** 265 Km
- **Operational capacity:** 100 thousand barrels per day
- **Will transport:** gasoline, diesel and jet fuel
- **Estimated investment:** 800 million USD

In September 2016, Novum Energy completed México's first private import of diesel fuel. Transportation of the diesel into Mexico was by road for a mining company

CRE also grants permits for transportation of petroleum products by means other than pipeline, such as railways



Ferrocarril Mexicano, S. A. de C. V.

Permit: PL/12953/TRA/OM/2015

Destinations: Guadalajara, Jalisco; Chihuahua, Chihuahua; Piedras Negras, Coahuila de Zaragoza; Nogales, Sonora, Mexicali, Baja California and Manzanillo, Colima.



Kansas City Southern de México, S.A. de C.V.

Permit: PL/12952/TRA/OM/2015

Destinations: Puebla, Puebla; Distrito Federal; Cadereyta Jiménez, Nuevo León; Tampico y Ciudad Madero, Tamaulipas; Lázaro Cárdenas, Michoacán; Durango, Durango; Minatitlán y Coatzacoalcos, Veracruz; Salina Cruz, Oaxaca; Ciudad Valles, San Luis Potosí, Tula de Allende, Hidalgo, as well as Salamanca and Irapuato, Guanajuato.

Investment: 1.5 billion dollars



Línea Coahuila Durango, S.A. de C.V.

Permit: PL/13373/TRA/OM/2016

Destinations: Durango, Durango.



FERROSUR, S. A. DE C. V.

Permit:

PL/12954/TRA/OM/2015

Destinations: Veracruz and Coatzacoalcos, Veracruz.



Ferrocarril del Istmo de Tehuantepec, S.A. de C.V.

Ferrocarril del Istmo de Tehuantepec, S. A. de C. V.

Permit: PL/13551/TRA/OM/2016

Destinations: Valladolid and Mérida Yucatán

In the first quarter of 2017, **for the first time, Pemex started importing diésel and gasoline by train**

- **Operating capacity:** 240 thousand barrels
- **Destination:** San José Iturbide, Guanajuato
- **Terminal:** Gas Natural del Noroeste S.A. de C.V. operated by Grupo SIMSA
- **Permit holder:** Kansas City Southern de México, S.A. de C.V.

Storage plan for hydrocarbons K'eri (5 rail port)

- **First Rail port:** Aguascalientes
- **Investment:** 900 millones de pesos
- **Started construction:** en 2 meses
- **Volume:** solicitarán permiso para 220 mil barriles
- **Influence Zone:** Zacatecas, San Luis Potosí, Aguascalientes

Gasoline and diesel storage is a business line which is also drawing investment attention



Investment: 427 million dollars

1 Cabo Fuels Las Torres, S.A. de C.V.

- **Capacity:** 7,296 bls.
- **Investment:** 24.6 million pesos
- **Location:** La Paz, Baja California Sur

2 Combustibles de Oriente, S.A. de C.V.

- **Capacity:** 5,606 bls.
- **Investment:** 143.3 million pesos
- **Location:** Matamoros, Tamaulipas

3 Hydrocarbon Storage Terminal, S.A.P.I. de C.V.

- **Capacity:** 280,500 bls.
- **Investment:** 1,073.4 million pesos
- **Location:** Acolman, Estado de México

4 Interport FTZ S.A. de C.V.

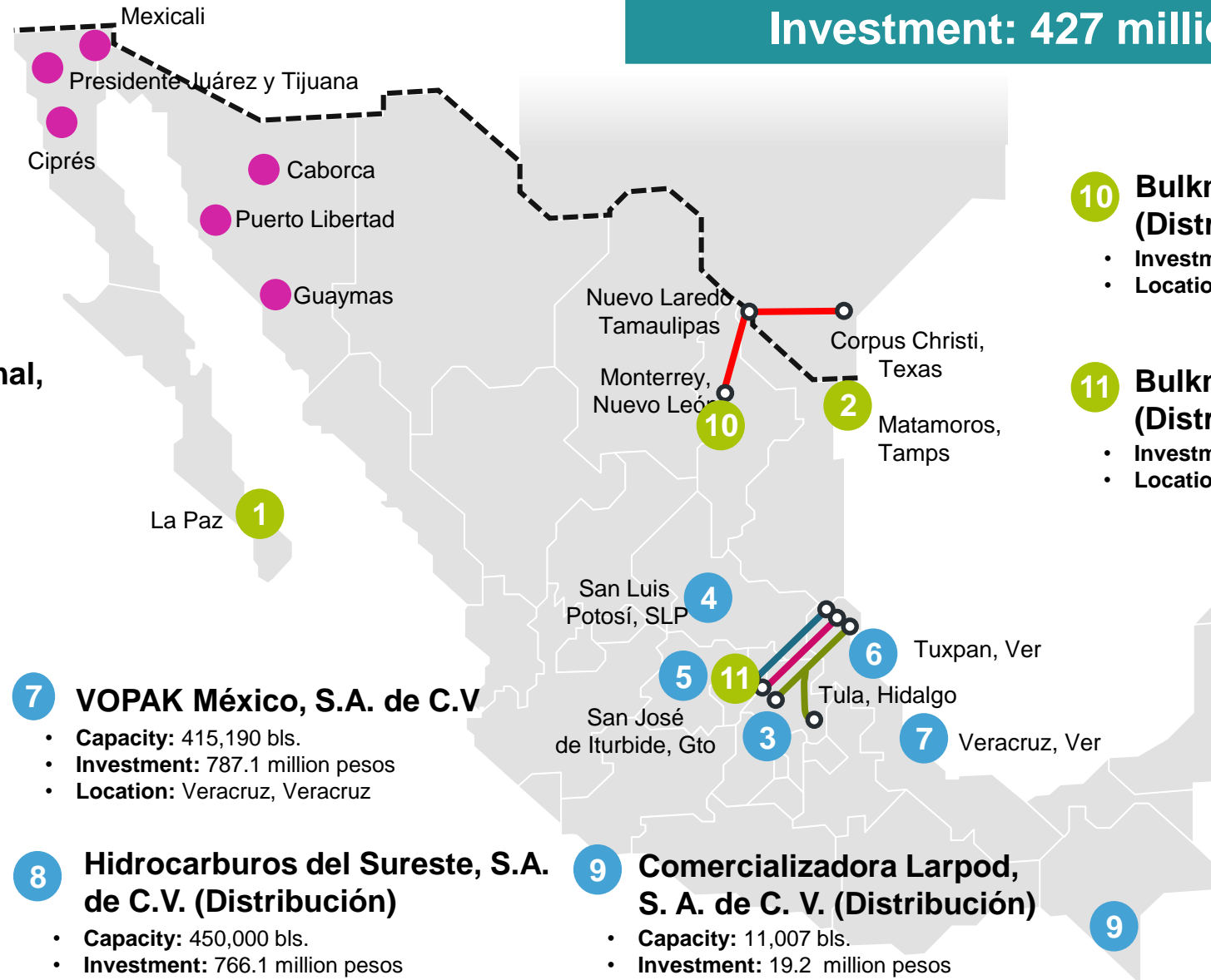
- **Capacity:** 280,500 bls.
- **Investment:** 1,073.4 million pesos
- **Location:** Acolman, Estado de México

5 Gas Natural del Noroeste S.A. de C.V.

- **Capacity:** 48,000 bls.
- **Investment:** 380.3 million pesos
- **Location:** San José Iturbide, Guanajuato

6 Orizaba Energía, S. de R.L. de C.V.

- **Capacity:** 2,310,000 bls.
- **Investment:** 2,308.8 million pesos
- **Location:** Tuxpan, Veracruz



7 VOPAK México, S.A. de C.V.

- **Capacity:** 415,190 bls.
- **Investment:** 787.1 million pesos
- **Location:** Veracruz, Veracruz

8 Hidrocarburos del Sureste, S.A. de C.V. (Distribución)

- **Capacity:** 450,000 bls.
- **Investment:** 766.1 million pesos
- **Location:** Progreso, Yucatán

9 Comercializadora Larpod, S. A. de C. V. (Distribución)

- **Capacity:** 11,007 bls.
- **Investment:** 19.2 million pesos
- **Location:** Puerto Madero, Chiapas

10 Bulkmatic de México (Distribución)

- **Investment:** 1 billion pesos
- **Location:** Salinas Victoria, Nuevo León

11 Bulkmatic de México (Distribución)

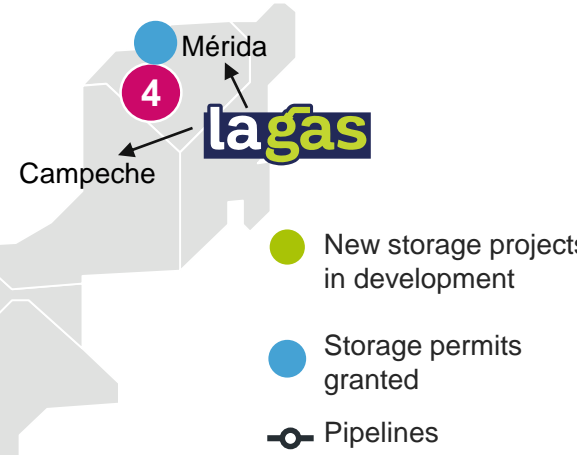
- **Investment:** 1 billion pesos
- **Location:** Tula, Hidalgo

- New storage projects in development
- Storage permits granted
- Pipelines
- CFE power stations with available capacity for investment

Furthermore, the new business environment allows greater competition and differentiation in product supply, services and retail prices at gas stations in Mexico



Announcement of competitors

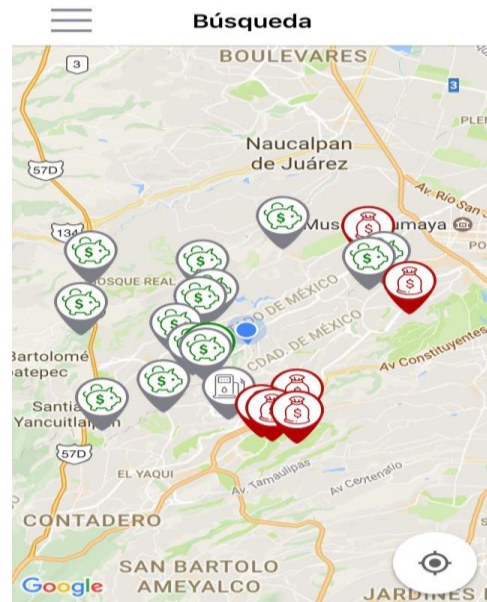


A key tool to enhance the consumer's empowerment and price monitoring is the mobile application "Gasos-App"



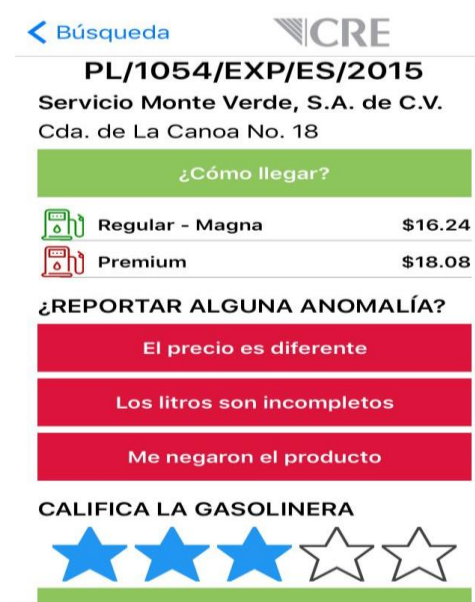
1

The app updates based on the **user's location**



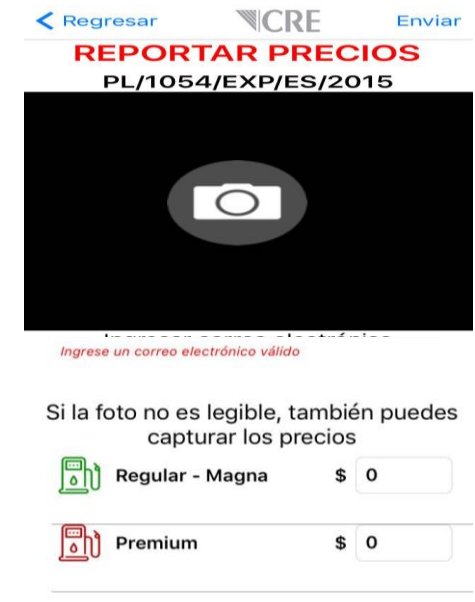
2

The app displays the **closest gas stations from the user**



3

By selecting the icon of a gas station, **information on their products, prices, permit number and address will be displayed. Also, the app allows to rate the station's service**



4

It will be possible to **submit a report with a picture to CRE when the offered prices do not match those published in the app**

Energy production and use accounts for two-thirds of GHG emissions at a global level. In this regard, Mexico is working closely with the international community to meet multilateral climate goals



PARIS2015

CONFÉRENCE DES NATIONS UNIES
SUR LES CHANGEMENTS CLIMATIQUES

COP21·CMP11

<2°C max
global average
temperature increase

187
signatory countries
are invited to submit their
INDCs*

55 ratification
instruments
+ **55%** of global GHG*
conditions for entry into
force¹

On March 28th, 2015, Mexico **became the first developing country to present its INDC**. Mexico has committed to:

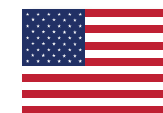
25% Unconditional
reduction of its Greenhouse
Gases and Short Lived
Climate Pollutants emissions
by 2030

Up to 40%
Conditional reduction
subject to a global
agreement providing an
international price on
carbon, access to financing
and technology transfer

On **September 21st, 2016**, Mexico ratified the Paris Agreement

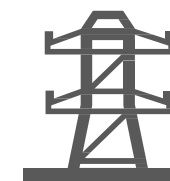
NORTH AMERICAN LEADERS' SUMMIT

OTTAWA 2016



45% reduction of
methane emissions in
North America by 2025

50% of clean power
generation by 2025



Collaborating on cross-border transmission projects

- At least 6 transmission lines currently proposed or in permitting review, such as the Great North Transmission Line, the New England Clean Power Link, and the Nogales Interconnection, **would add approximately 5,000 MW of new cross-border transmission capacity.**

¹ As of September 22nd, 60 Parties have ratified accounting for 47.6% of the total GHG emissions.

* INDC: Intended Nationally Determined Contributions; GHG: Greenhouse Gas

As a result of the two Long-Term Auctions, 15 states will benefit from the development of new clean energy projects in Mexico



34 companies
from more than 10 countries, including Mexico

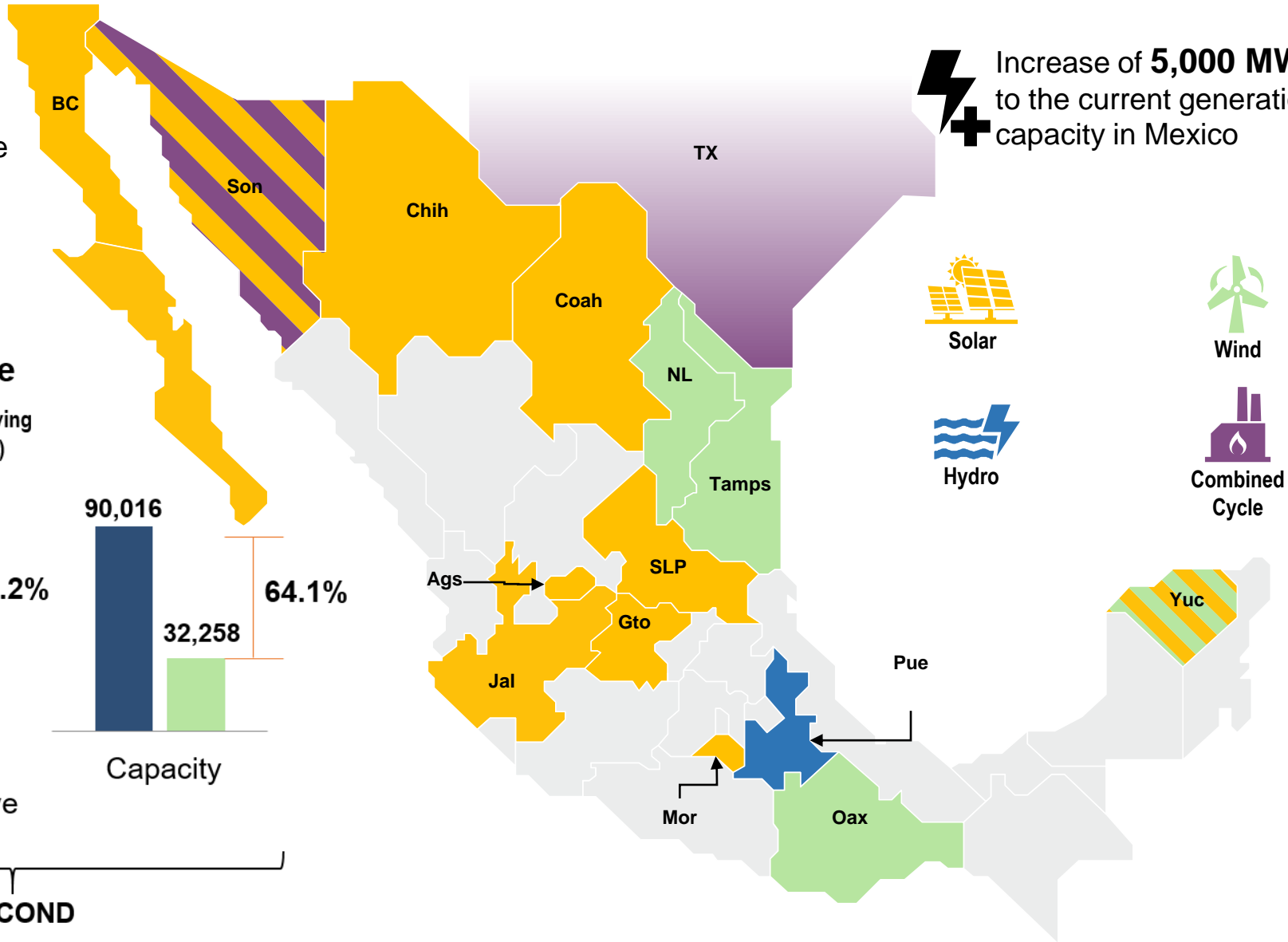
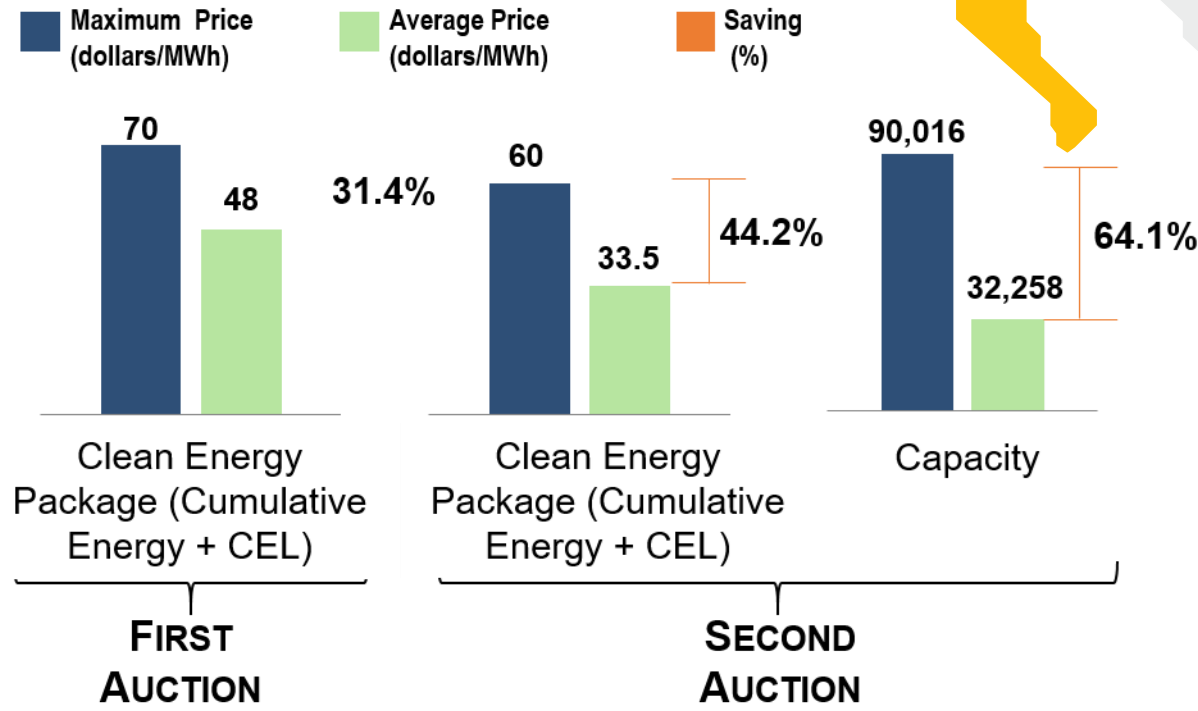


6.6 billion
of investment in the coming years



Increase of **5,000 MW**
to the current generation capacity in Mexico

Maximum Price VS Average Price



Awarded companies of the two Long-Term Auctions



1st Auction=
11 companies



COMISIÓN FEDERAL
DE ELECTRICIDAD

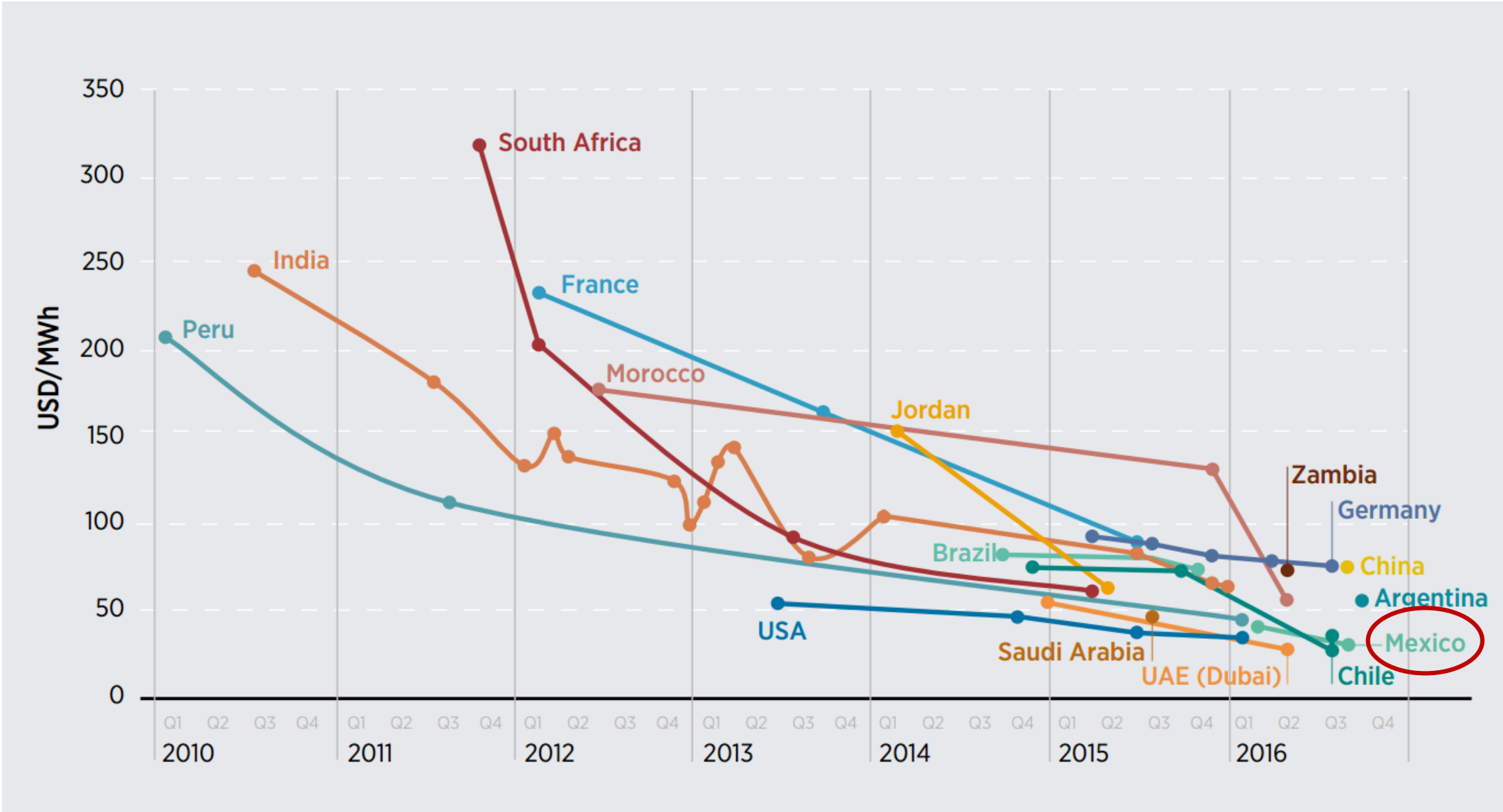


X-ELI+



2nd Auction=
24 companies

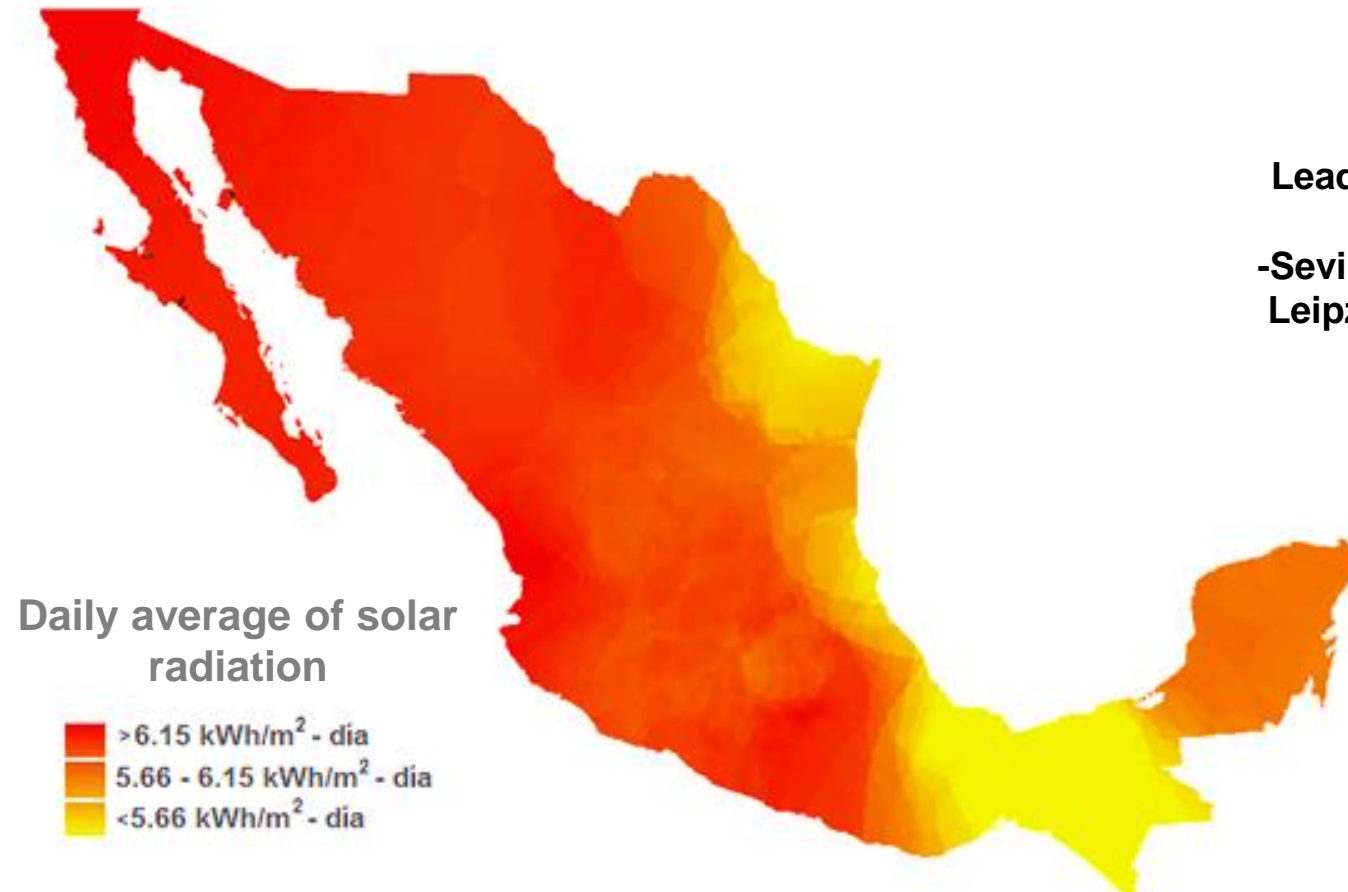
Evolution of average solar prices in auctions, January 2010- September 2016



Source: IRENA, 2017

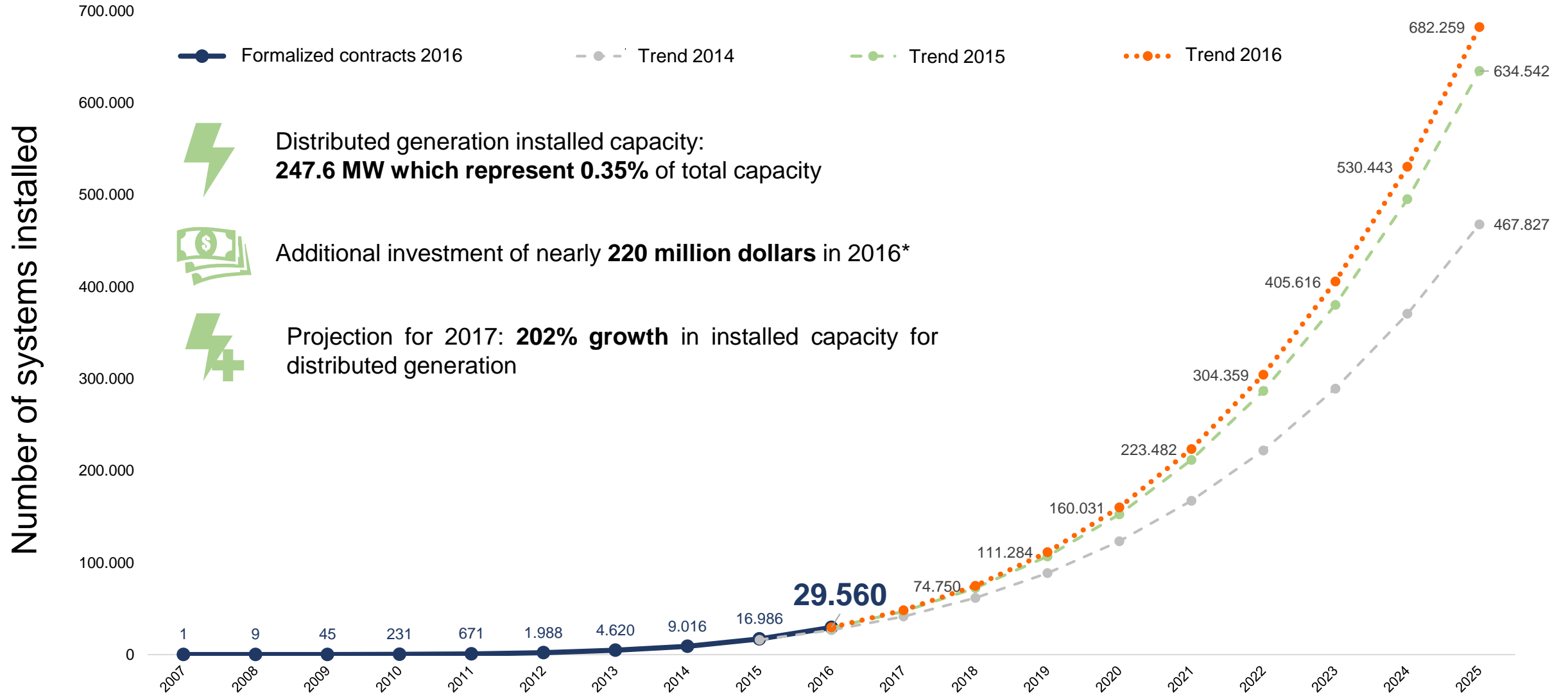
Energy-related opportunities for businessmen and households: Clean Energies

Mexico has a significant, constant and highly predictable renewable potential: a **medium annual irradiation of approximately 5.5 kWh/m² per day**



Leaders of solar capture
in Europe*:
-Sevilla with 4.7 kWh/m² -
-Leipzig with 2.7 kWh/m²

In December 2016, CRE issued a new set of regulations to foster the sustainable integration of distributed generation nationwide



Note: Elaborated with information provided by CFE. Preliminary data up to December 31st, 2016.

*Considering an average investment of 1.7 million dollars per MW of installed capacity, according to Bloomberg

Energy-related opportunities for businessmen and households: Clean Energies



A new set of rules for solar rooftops have been developed, promoting the **democratization of electricity in Mexico**



Easier procedures,
with very simple
contracts



New contract models for
interconnection (net metering, net
billing and direct sales)



Decrease in the response time
(18 days max.)

Clean Distributed Generation has the potential of:



Reducing **1.9 tons of
CO2** per year



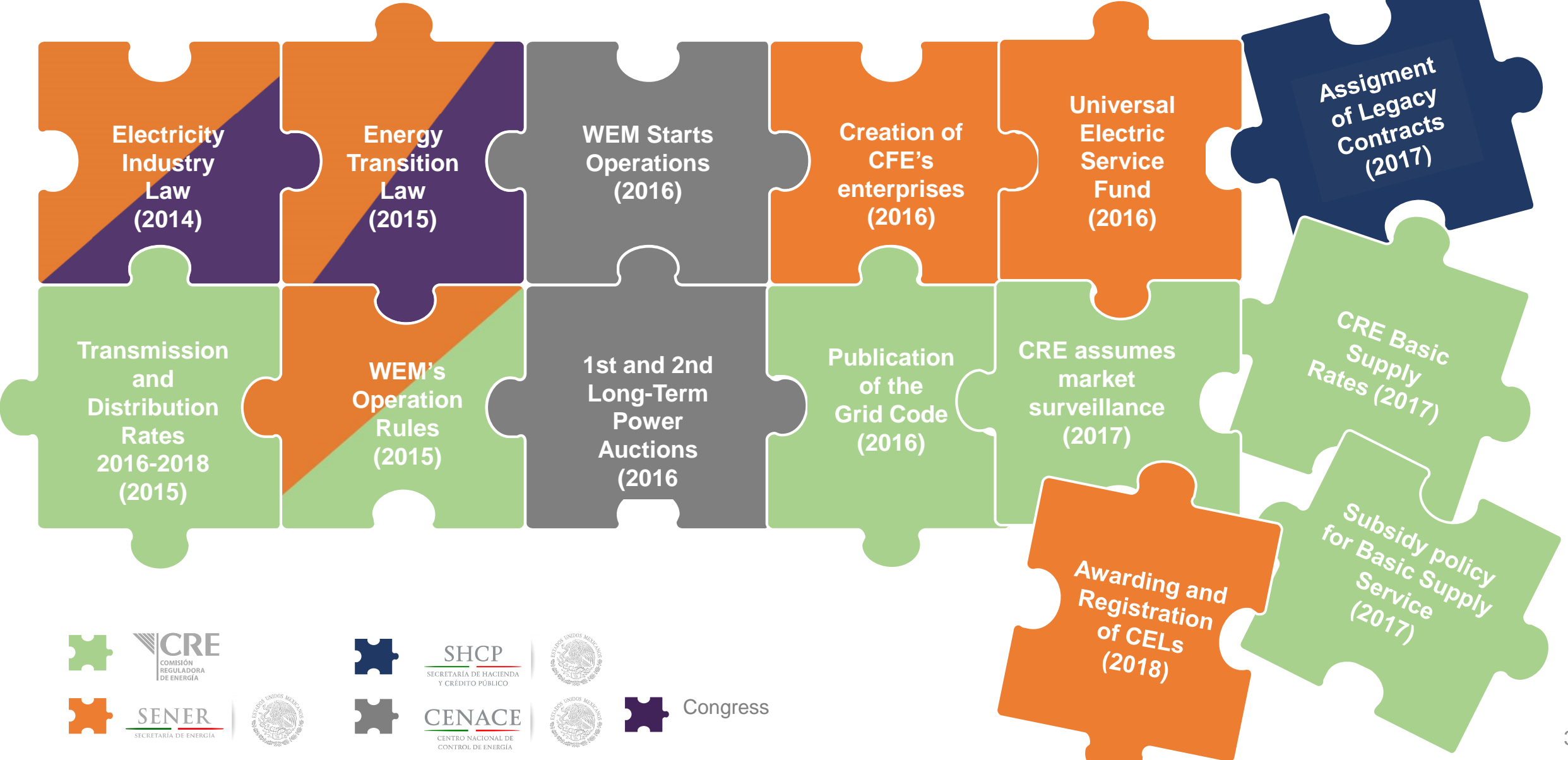
Saving **6.6 billion pesos in
subsidies**, by the incorporation of
5% of Distributed Generation



Saving **680 million liters of water**
per year

1 out of 50 new jobs created in the United States come from the solar industry (twice as much as in the coal industry)

The implementation of the Energy Reform is moving towards the consolidation of a dynamic and competitive Wholesale Electricity Market (WEM)



Mexico is taking steps in the right direction in terms of strengthening its transparency, accountability and anti-corruption frameworks. Recent legal reforms and policies are designed to reinforce the rule of law and enable a more attractive business environment



Establishment of a **National Anticorruption System (NAS)**. Constitutional amendment and 7 legal reforms.



NAS: institutional coordination platform among federal and local authorities. Checks and balances.



Steering Committee led by an independent citizen to oversee the NAS's performance.



Streamlined and strengthened procedures focused on **preempting, overseeing and penalizing** corruption.



Establishment of a **National Transparency System (NTS)** covering federal, state and municipal authorities.



New transparency framework enhancing access to **public information**, increasing the number of **regulated entities** and promoting **open government** best practices.

CRE has published online tutorials and initiated a workshop program to explain the application process and issuance of permits. Obtaining a permit is easy, fast and transparent



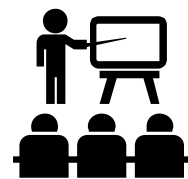
Workshops

| | | | |
|--|---|--|--|
|  Gas LP  10:00-12:00 hr Contacto  Aidé Rojas arojas@cre.gob.mx 5283 1500 ext. 1064 |  Electricidad  12:00-13:30 hr Contacto  Erick Vallejo 5283 1500 ext. 1141 |  Petrolíferos  16:00-18:00 hr Contacto  Ma. Elena Hernández mhernandez@cre.gob.mx 5283 1500 ext. 6036 |  Gas Natural  10:30-12:00 hr Contacto  Danae Burgueño dburgueno@cre.gob.mx 5283 1500 ext. 3017 |
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April 2017

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| 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| 30 | | | | | | |



Procedures and Online Services
Format for requesting hearings
16 working days, on average, to hold a hearing.

*Petroleum products' workshop to be confirmed



Mexico's Energy Regulatory Commission: Challenges and Opportunities in Reforming the Energy Industry



Guillermo I. García Alcocer
Chairman

April 20th, 2017
Panama



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