

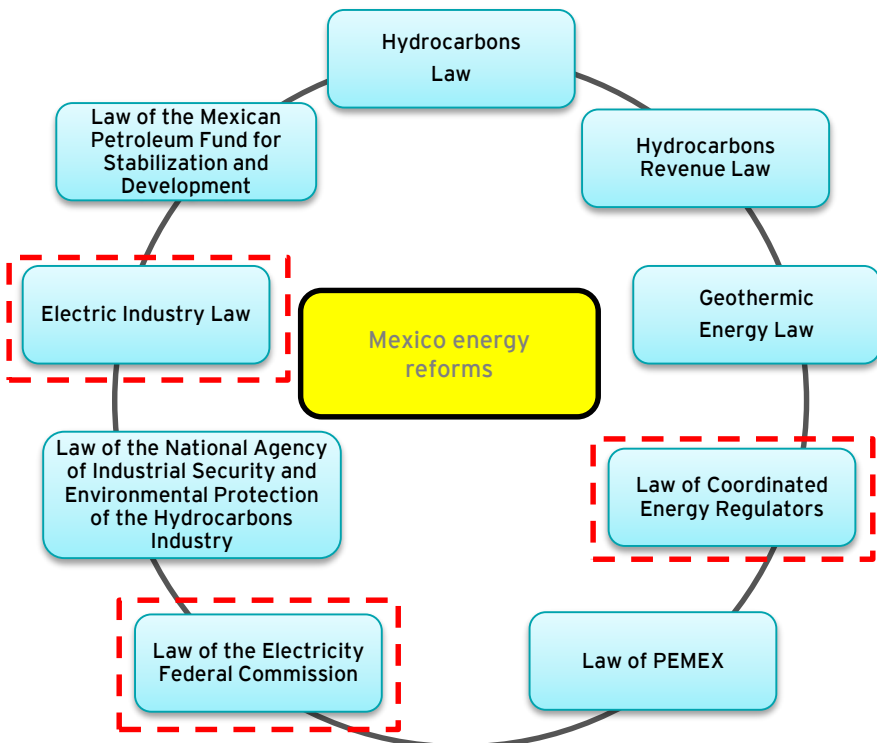
Overview of Mexico's Energy Reform


June 6, 2017



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Overview of Foundational Legal Reforms in the Mexican Energy Sector

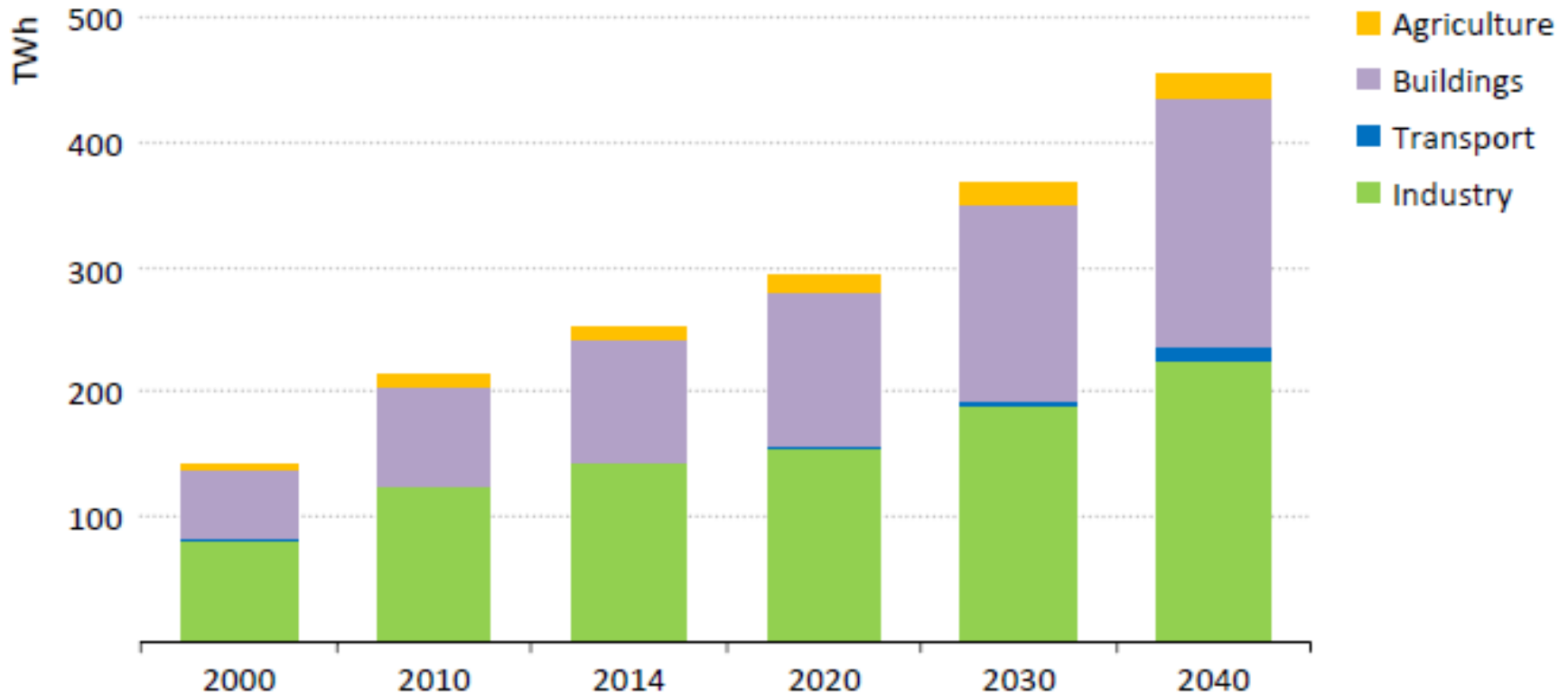


 Represents laws related to the power sector

- ▶ The constitutional amendment for the energy reform took effect in December 2013.
- ▶ Mexican President Enrique Peña Nieto submitted to the Mexican Congress a much-anticipated package of 9 new laws, as well as amendments to 12 existing laws in April 2014, to restructure the energy industry in Mexico and open up the power and oil and gas sectors to private participation.
- ▶ The Mexican energy reforms became effective in August 2014.
- ▶ The portions of the energy reforms that relate to the electrical power industry include three primary laws that create the framework for transitioning to open and competitive power markets in Mexico.
 - ▶ **Law of the Federal Electricity Commission (Ley de la Comisión Federal de Electricidad)** - Transforms the CFE into a "Productive State Enterprise" and establishes guidelines regulating acquisitions, leases, services, budget and debt.
 - ▶ **Law of Coordinated Energy Regulators**—Grants the Energy Regulatory Commission (CRE) independence and legal standing as well as technical, procedural and budgetary autonomy. The law is intended to facilitate CRE's regulatory and technical oversight of the energy industry.

- ▶ **The Electric Industry Law (EIL)**, which became effective in August 2014, establishes a legal framework to foster competition and private-sector participation in all aspects of the Mexican electrical power industry.
- ▶ The EIL requires CFE restructuring via functional separation of generation, transmission, distribution and marketing activities. Each business unit must have independent governance along with strict legal separation from the other business units. CFE is permitted to continue participation across all industry activities, but, through separate subsidiaries, which would run as independent business units.
- ▶ While distribution and transmission of electricity would remain under the control of the state, CFE would be authorized, through subsidiaries, to enter into agreements and joint ventures with private parties for the financing, installation, maintenance, management, operation and expansion of the transmission and distribution networks.
- ▶ The EIL establishes a wholesale market for electricity to be operated by the National Center for Energy Control or CENACE.

Drivers of reform: High electricity prices, growing intensity, and need for capital investment



Industry remains the largest electricity user in Mexico in the New Policies Scenario, although buildings sector demand rises more quickly

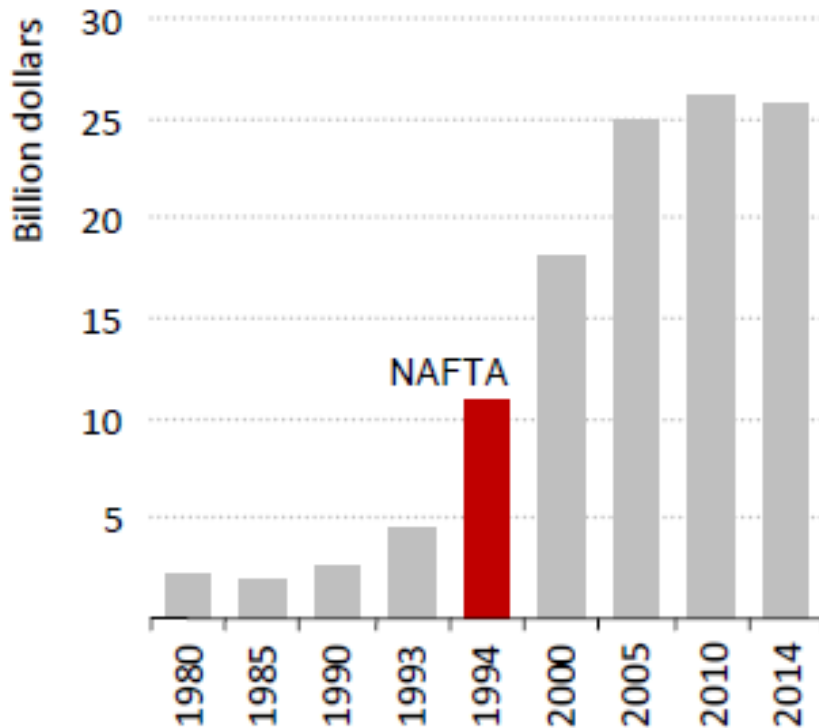
Note: TWh = terawatt-hours.

Mexico Is World's 7th largest car manufacturer

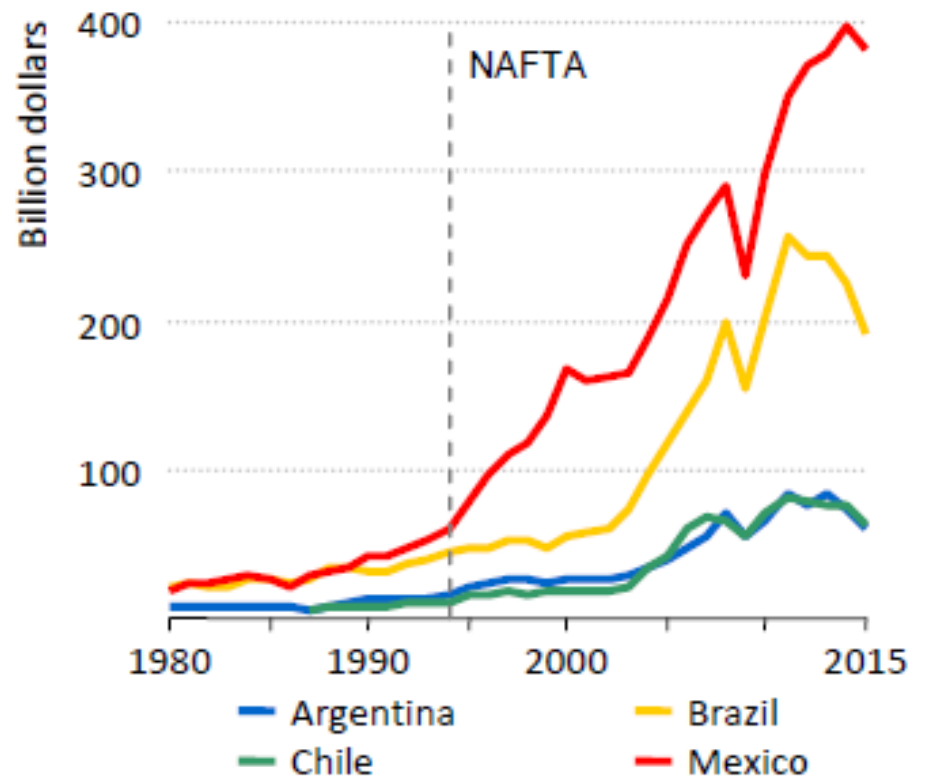
4th largest exporter of cars and light trucks

2nd largest supplier of vehicles to US (after Canada)

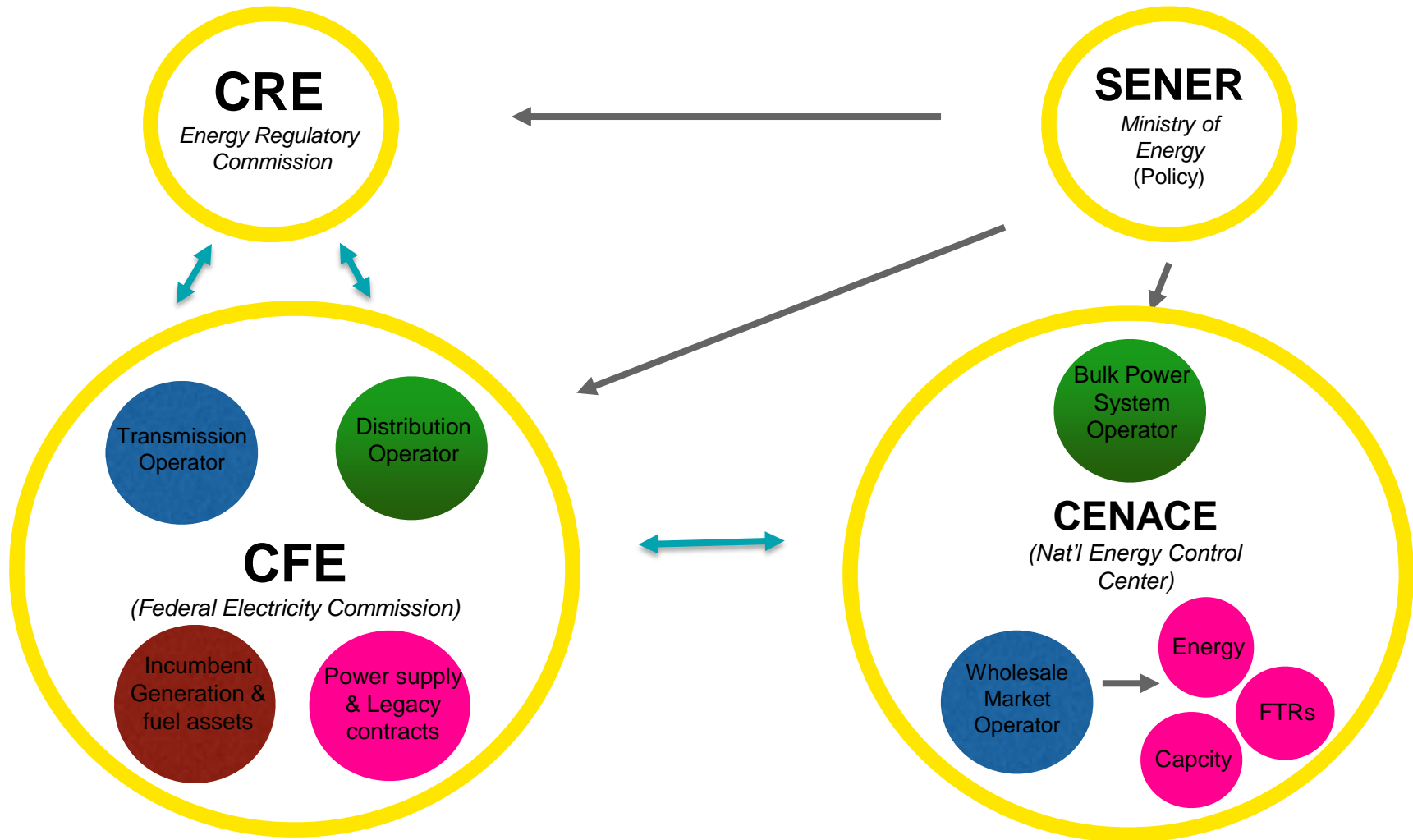
Inward foreign direct investment



Exports of goods and services



Mexico's Power Sector Reform (State-Governed Roles and Responsibilities)



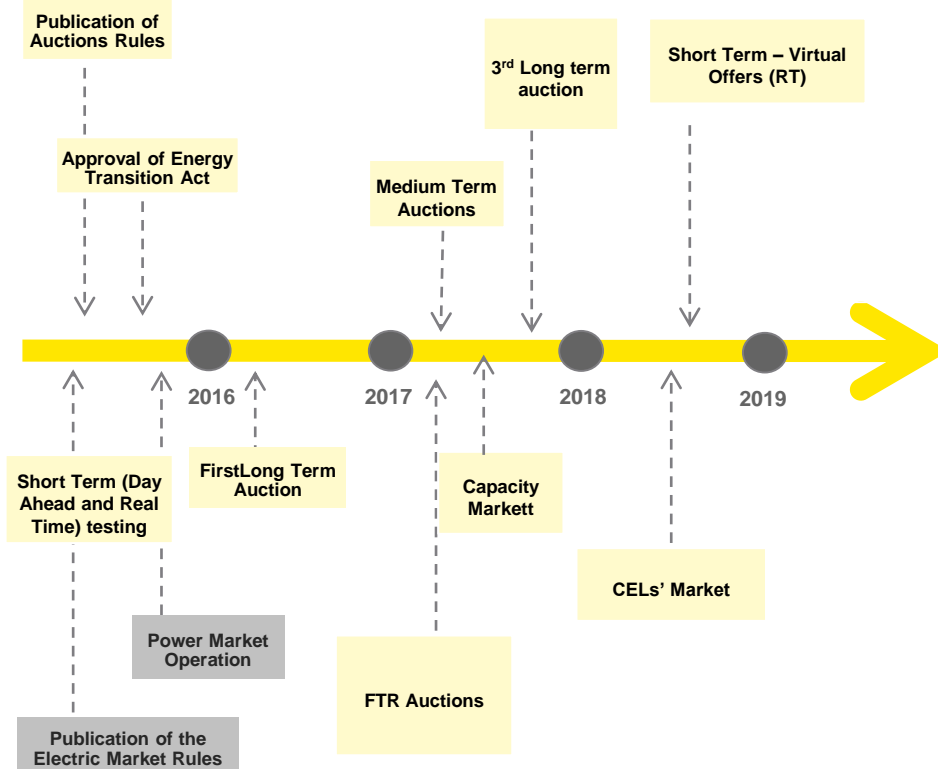
Mexico Energy Reform – Functional Separation



Generation	Transmission	Distribution	Retail
<ul style="list-style-type: none"> ▶ Could be independent or provided by CFE ▶ Historically owned by CFE as regulated service ▶ In future, revenue realized through sale of: <ul style="list-style-type: none"> ▶ Energy (MWhs) ▶ Capacity (MWs) ▶ Ancillaries 	<ul style="list-style-type: none"> ▶ Assets owned by CFE ▶ Now managed by one Regional Transmission Organization (RTOs) – e.g., CENACE ▶ FTR opportunity to reduce cost (near-term) or trade (long-term) 	<ul style="list-style-type: none"> ▶ Assets owned by CFE ▶ Approximately 40M customers ▶ Metering and billing done separately 	<ul style="list-style-type: none"> ▶ Energy and capacity sold to end users ▶ Various geographic, calendar products around energy ▶ Value added services offered (generators, retailers, etc.)

Energy market reforms timeline

Implementation schedule of Wholesale Electricity Market



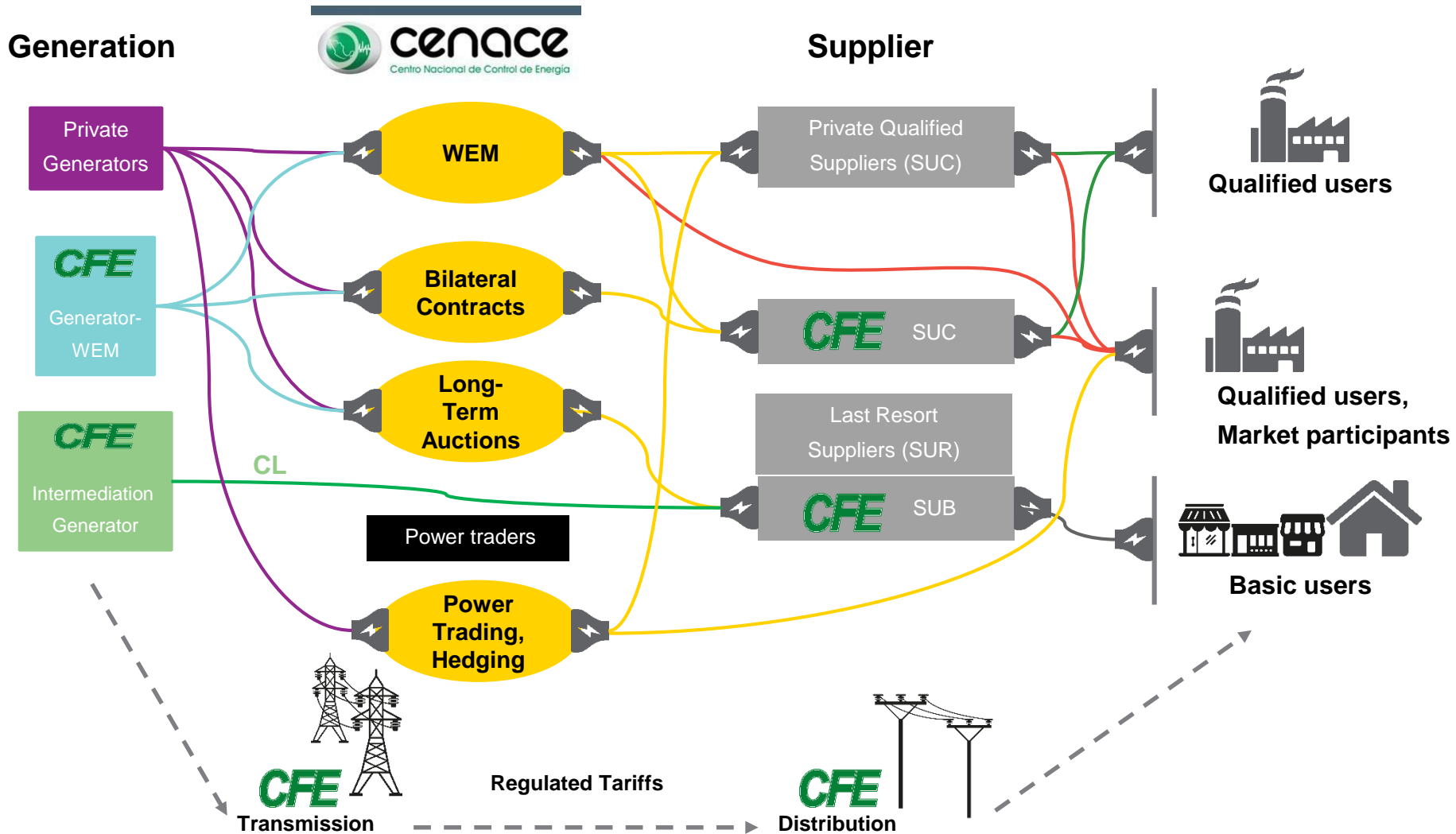
Transactions' markets	Term	Product	Test / Award	Operation Entry
Short Term - Day Ahead	Schedule	Energy / Serv. Related	September 2015	January 2016
Short Term - Real Time	Schedule	Energy / Serv. Related	September 2015	January 2016
Short Term - Virtual Offers	Schedule	Energy / Serv. Related	2018	2018
Long term Auctions	15 years	Energy	May 2016	September 2018
Long term Auctions	15 years	Power	May 2016	September 2018
Long term Auctions	20 years	CELs	May 2016	September 2018
Medium term Auctions	3 years	Energy	October 2016	TBD
Medium term Auctions	3 years	Power	October 2016	TBD
DFT Auctions	Per year / 3 years	Financial Transmission Rights	November 2016	TBD
Capacity Market	1 year	Power	February 2017	TBD
CELs' Market	1 year	CELs	2018	2018

Source: SENER

Actions that directly impact clean energy

The obligation to purchase CEL for UCPM and SUC will start on 2018

Mexico energy market post reform structure



Source: SENER, EY

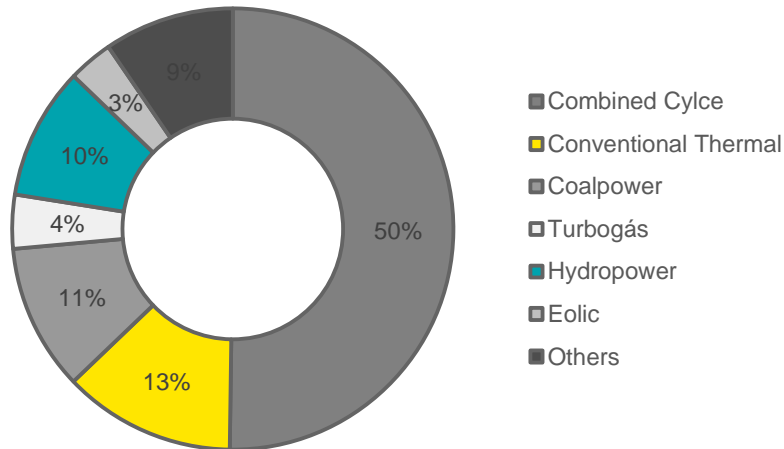
Simplified scheme

Power Generation Statistics for 2016

Dependency on natural gas grows

50% of Mexico's power demand was satisfied with natural gas combined-cycle units

Electric Power Generation by type of Technology for 2016



Source: EY with data of PRODESEN

PRODESEN 2017-2031

Power Generation by CFE

2015	2016	Category
55.2%	54.7%	CFEs' power plants
28.8%	27.8%	Independent Production
16.0%	17.5%	Others

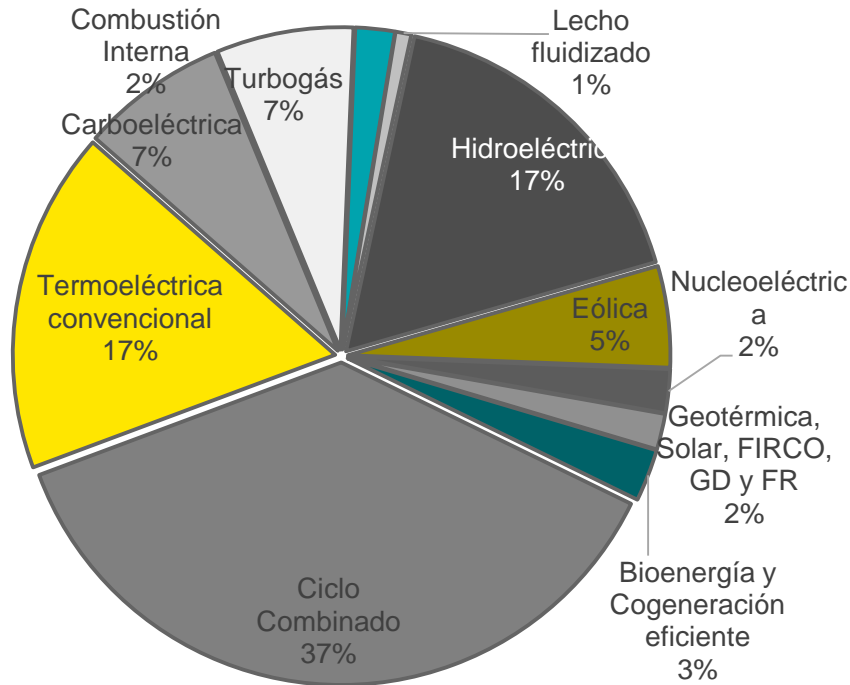
In 2016, total generation was 319,364 GWh, or 3.2% more than 2015, maintaining the same proportion of conventional (79.7%) and clean technologies (20.3%)

Electricity generation from conventional technologies increased by 3.2% in 2016 as compared to 2015, primarily driven by increased energy output from internal combustion (18.5%) and turbogás (8.2%) units

Compared to 2015, generation of electricity from clean sources increased 3%. This was mainly due to a 20% increase in wind and a 33% increase co-generation units

2016 Installed Capacity Analysis

Generation Fleet expands 7.2% to 52,331 MW



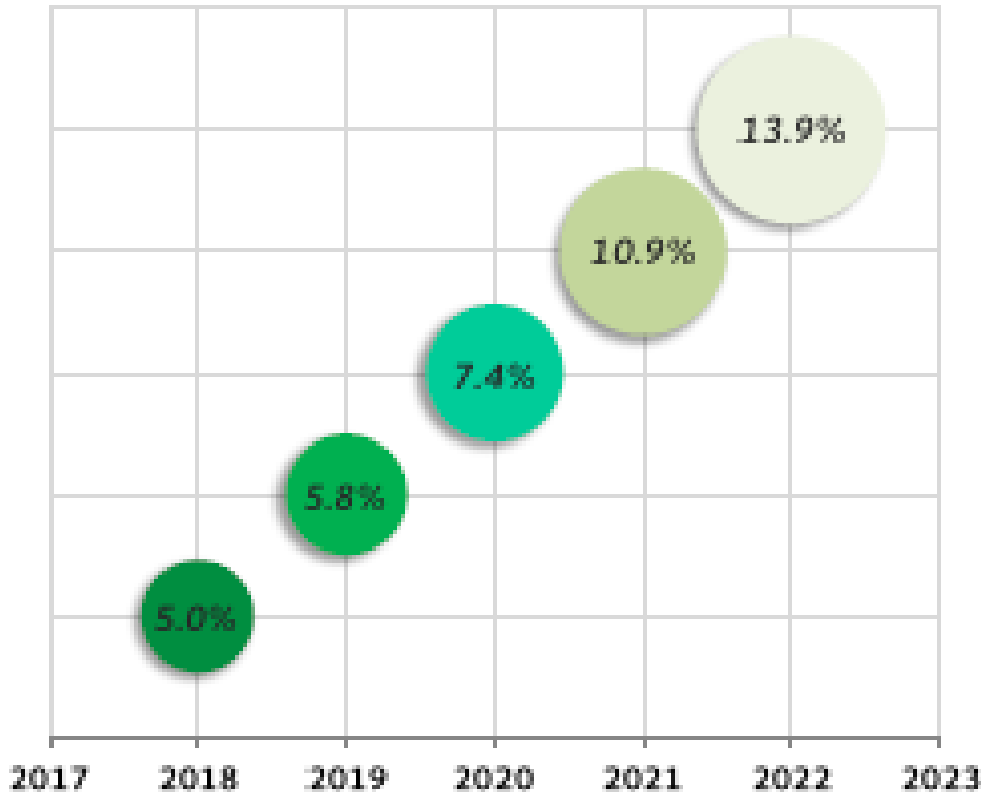
KEY OBSERVATIONS:

- ▶ Fossil fuel units comprised 71% of the generation fleet
- ▶ Natural Gas combined cycle units grew by 13.4 % and now represent 37% of installed capacity
- ▶ Wind adds 930 MW (a 33% increase)
- ▶ Solar doubles, with utility scale increasing from 56 MW to 145 MW, and distributed solar increasing 114% (from 114 MW to 244MW)
- ▶ Hydroelectric equals 12,589 MW, a slight increase over 2015 (0.9%)
- ▶ Efficient co-generation more than doubles (from 583 MW to 1036 MW)
- ▶ Reliance on internal combustion units increases by 22.5% (from 1186 MW to 1453 MW)
- ▶ Nuclear capacity at the Mexico's sole La Guna station expands 6.5% to 1608 MW

PRODESEN 2017-2031

CLEAN ENERGY MANDATES

Clean Energy Standard



- ▶ National Target: 35 percent by 2024, 50% by 2050 (includes existing clean resources)
- ▶ Clean energy defined as non-fossil fuel sources (with exception of natural gas co-generation and CCS)
- ▶ All electricity suppliers must procure Clean Energy Certificates
- ▶ Two long-term clean energy auctions expected to meet 39% and 56% of CEC obligations in 2018 & 2019, respectively

CENACE Long-Term Auctions: *Two down, One to Go*

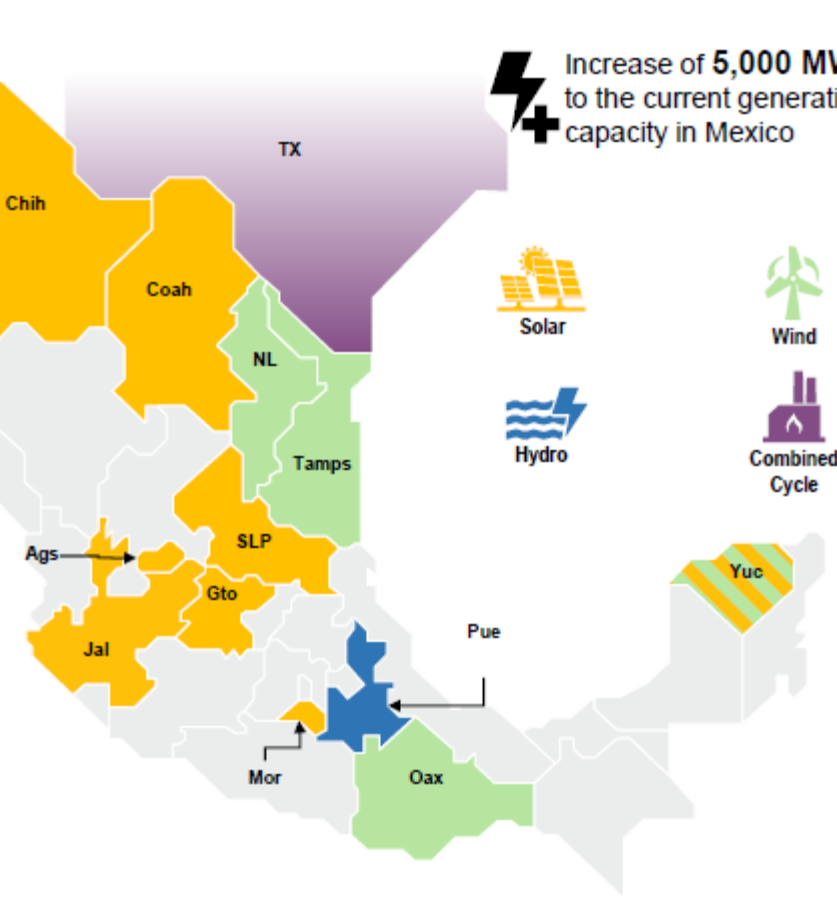
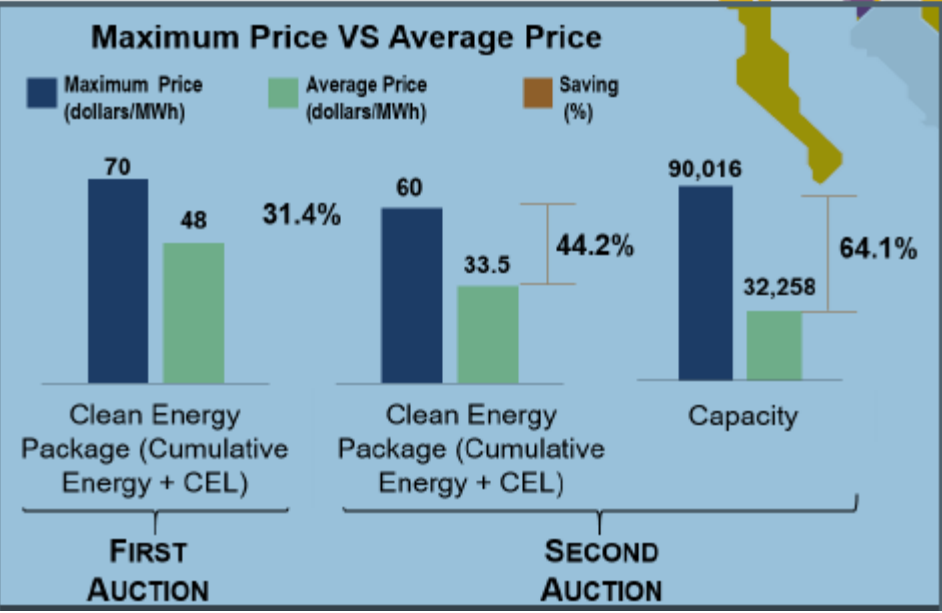
As a result of the two Long-Term Auctions, 15 states will benefit from the development of new clean energy projects in Mexico



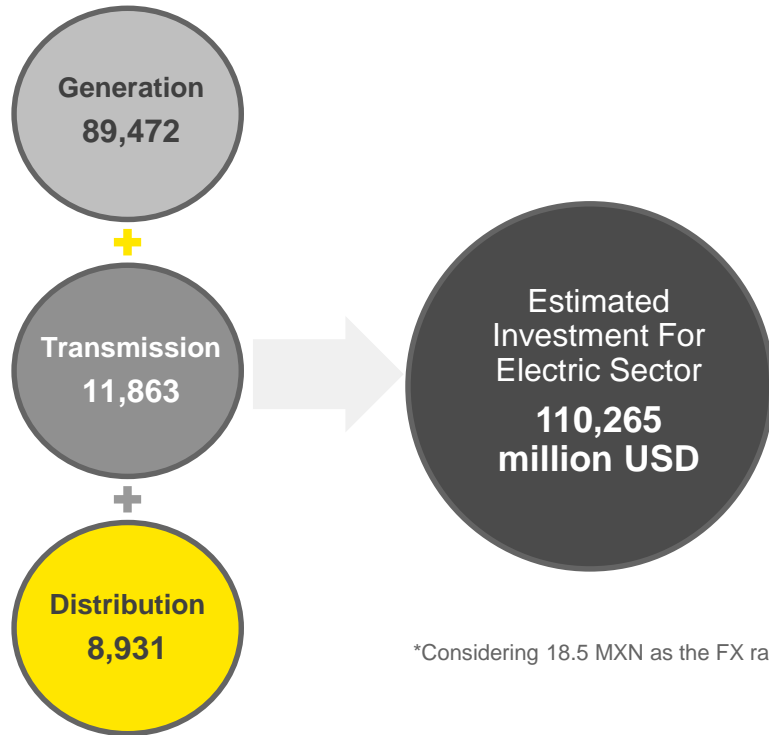
34 companies
from more than 10 countries, including Mexico

6.6 billion
of investment in the coming years

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

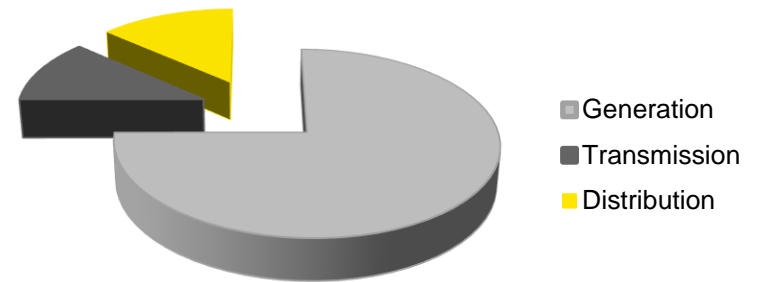


The Mexican government maintains a centralized planning role for entire power sector. 15-year strategic plan (PRODESEN) projects \$110 million USD investment for infrastructure projects



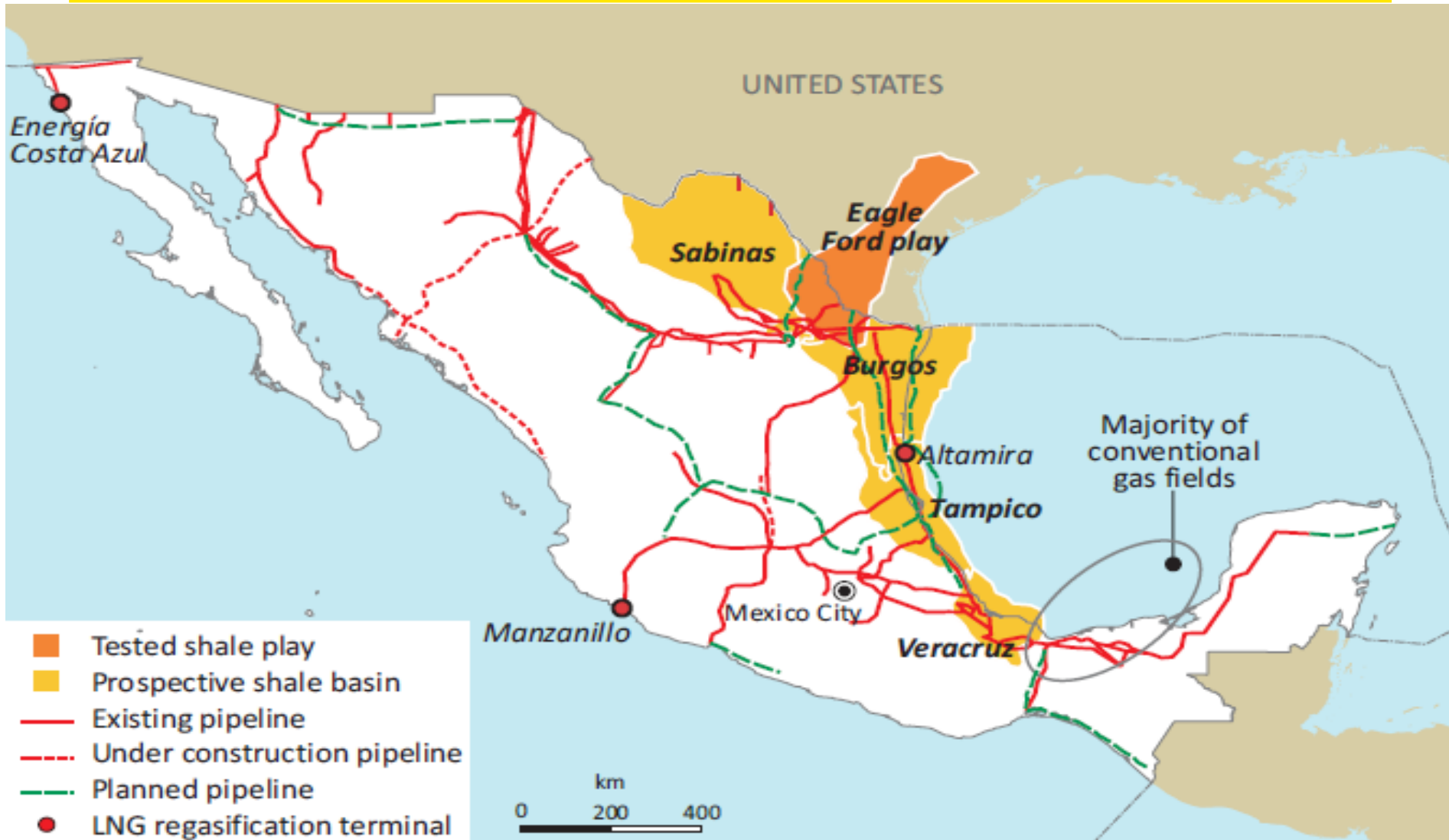
*Considering 18.5 MXN as the FX rate

- ▶ PRODESEN represents the Ministry of Energy's 15-year strategic investment plan
- ▶ 81% corresponds to generation projects, 11% to transmission projects, and 8% to distribution projects.
- ▶ Total investment is 9% less than 2016 PRODESEN projection



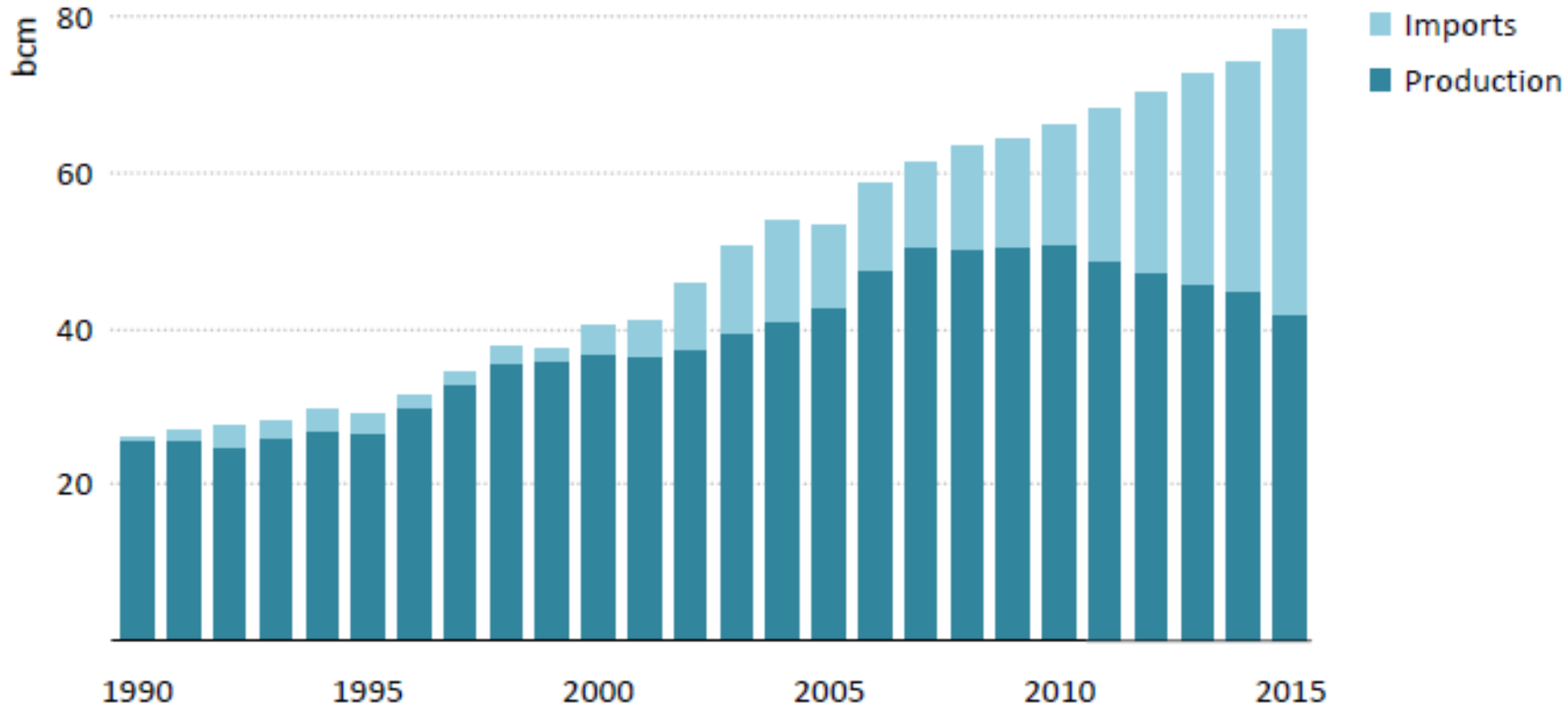
Source: EY with data of PRODESEN

Natural Gas Will Dominate Mexico's Energy Landscape (For the foreseeable future)

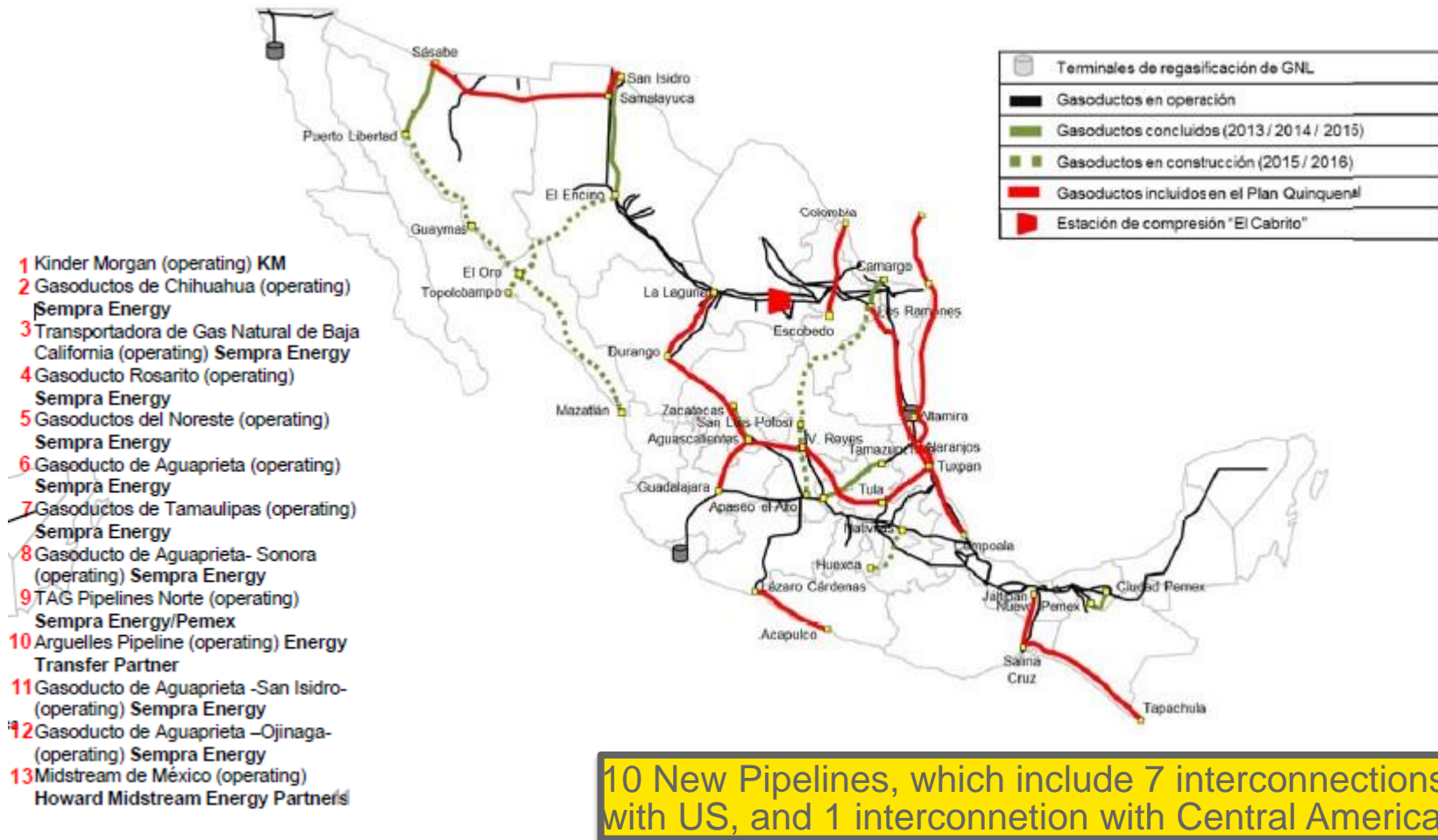


Mexico's natural gas production (primarily O&G associated) is in decline. Rising US imports account for 40% of supply

10 percent of US gas is imported to Mexico

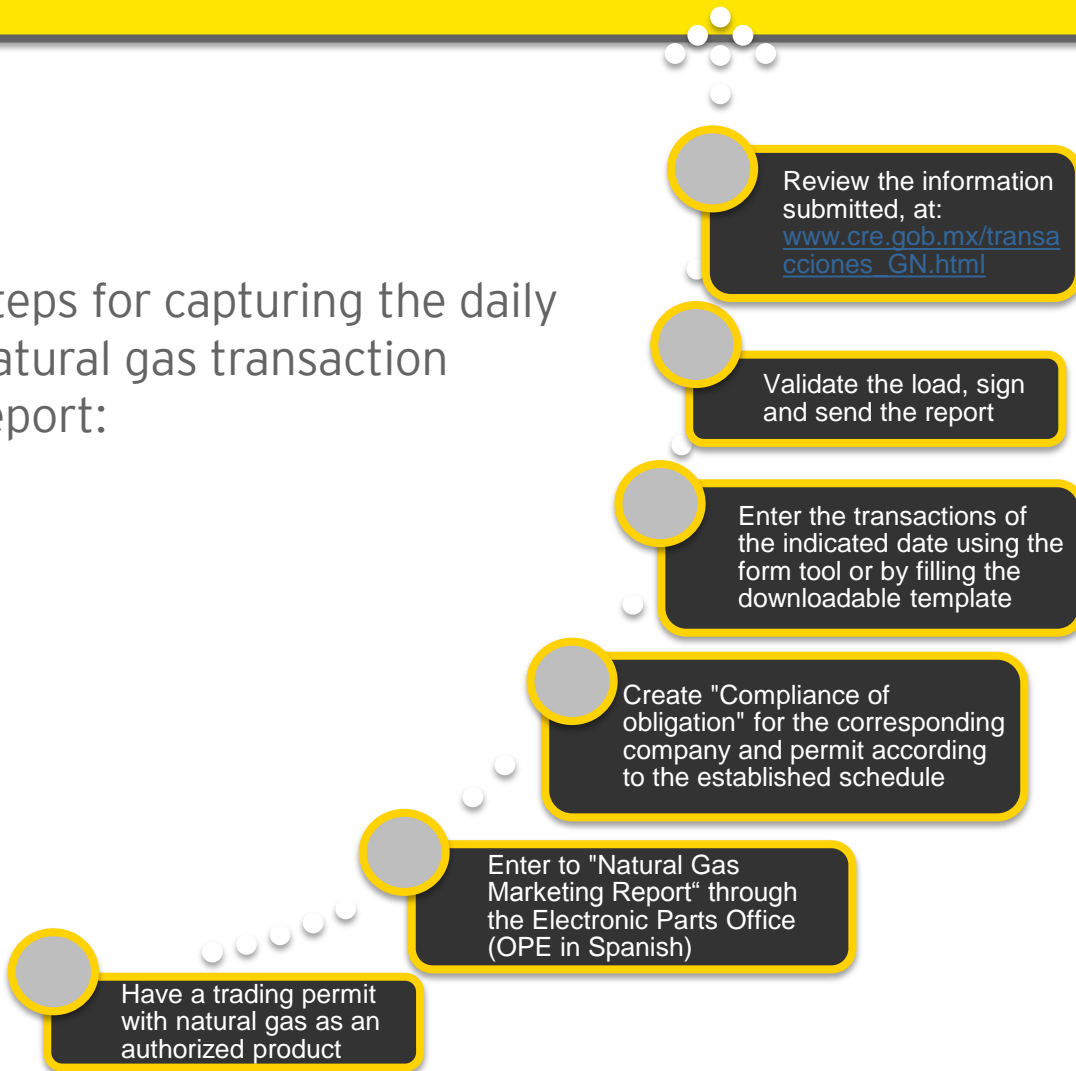


Mexico's National Pipeline System is Undergoing Substantial Expansion - 13 Projects through 2019



Independent System Operator (CENAGAS) Will Implement an Open Market Platform and Natural Gas Daily Trading System

Steps for capturing the daily natural gas transaction report:

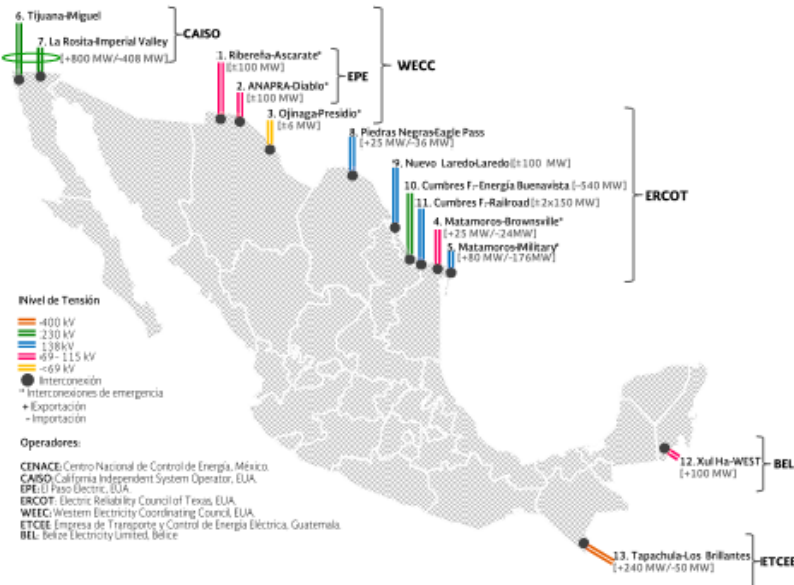


Transmission Interconnections to North and Central America

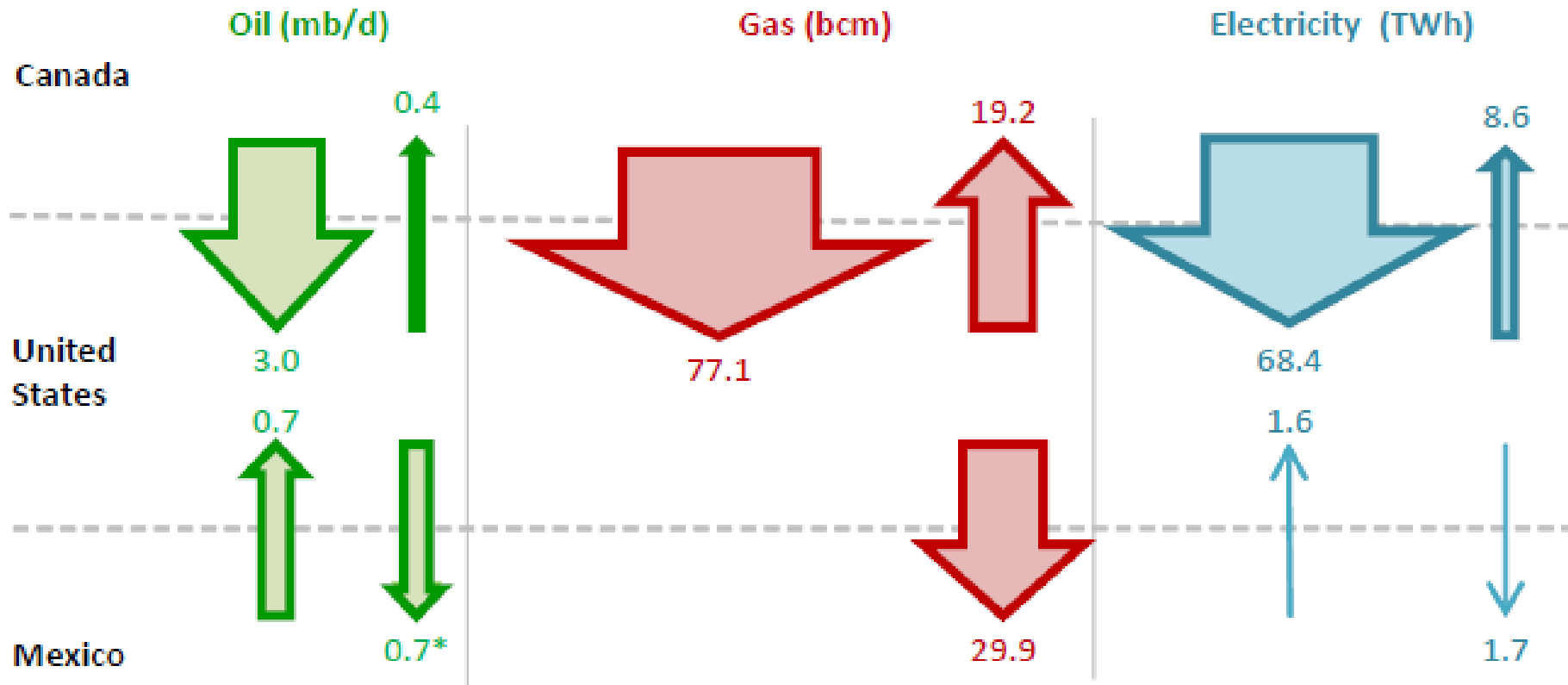
Mexico's Interconnection Commission (SIEPAC) continues planning and collaboration with authorities in the United States and Central America to evaluate feasibility of additional interconnections, expanded coordination and alignment of energy markets

Interconnections to 6 Different Systems

- ▶ Total Interconnections = 13
- ▶ California ISO (CAISO) = 2
- ▶ Southwest Power Pool (SPP) = 3
- ▶ Texas (ERCOT) = 6
- ▶ Belize = 1
- ▶ Guatemala = 1
- ▶ 5 of 13 are emergency interconnections along US border



Snapshot of Cross Border Trades





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