Mexico Gas and Power Reform Review: From concept to reality

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For Gas/Electric Partnership 2017: Opportunities in Infrastructure

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Mexico’s new gas and power sectors: Still under construction

- Plan for the implementation of the gas market
- First and second power auctions
- Wholesale power market
- Indicative power sector plan (PRODESEN)
- Operating entities CENAGAS and CENACE
- Constitutional reform
- Transference of resources from CFE to CENACE
- Transference of resources from PEMEX to CENAGAS
- Administrative regulations
- Secondary legislation

- Power tariff regulations
- Clean energy certificates market
- Effective open access to gas pipelines
- Contract release program from PEMEX
- Gas price liberalization
- Financial transmission rights
- Power capacity market
- Sistrangas open season
Mexico’s gas and power market fundamentals
Pipeline imports have outpaced the share of domestic production

Historical monthly gas supply in Mexico by source

- **Domestic production has declined 30% since January 2011**
- **LR I/Net Mexico pipelines online**
- **Incremental spot LNG purchases**
- **Pipeline imports surpass domestic production; peak 4.2 Bcf/d Aug**

Source: IHS Energy, EIA, Ministry of Energy (SENER)
Increasing gas demand from power sector and uncertain recovery of domestic production pave the way for additional pipeline imports from the United States.
The majority of new pipeline capacity has been driven by CFE. Over the past few years, it has awarded 16 projects with total investment of nearly $10 billion.*

* See annex for additional details on pipelines.
The Northwest, West, and Central regions will become the fastest growing consumers of gas

### Regional demand outlook

<table>
<thead>
<tr>
<th>Year</th>
<th>East &amp; Peninsular</th>
<th>Northeast</th>
<th>Central</th>
<th>West</th>
<th>Northwest</th>
<th>North</th>
<th>BC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>8,000</td>
<td>4,000</td>
<td>6,000</td>
<td>4,000</td>
<td>1,000</td>
<td>2,000</td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td>10,000</td>
<td>6,000</td>
<td>8,000</td>
<td>6,000</td>
<td>2,000</td>
<td>3,000</td>
<td></td>
</tr>
</tbody>
</table>

Source: IHS Energy

### Compound annual growth rate by region

<table>
<thead>
<tr>
<th>Region</th>
<th>2015–20</th>
<th>2020–30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baja California</td>
<td>3.3%</td>
<td>4.4%</td>
</tr>
<tr>
<td>Northwest</td>
<td>18.6%</td>
<td>2.1%</td>
</tr>
<tr>
<td>North</td>
<td>4.8%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Northeast</td>
<td>1.1%</td>
<td>2.2%</td>
</tr>
<tr>
<td>East and Peninsular</td>
<td>1.1%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Central</td>
<td>4.5%</td>
<td>2.3%</td>
</tr>
<tr>
<td>West</td>
<td>5.5%</td>
<td>3.1%</td>
</tr>
</tbody>
</table>

Source: IHS
Natural gas pipeline flow directions 2020

Natural gas pipeline flow directions in 2020

Interregional flows
LNG imports
Domestic gas-to-market

Natural gas flows (MMcfd)

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Source: IHS

* Values for 2015.
Natural gas pipeline flow directions in 2026

Natural gas flows (MMcf/d)
- Interregional flows
- LNG imports
- Domestic gas-to-market

Source: IHS
Gas fired units dominate future power generation despite clean energy targets: 2018—25%, 2021—30%, 2024—35%
Most of Mexico’s new gas-fired power plants should come online in the northern states and central-west

Regional new gas fired capacity outlook (2016–30)
From concept to reality (?)
Gas and power sector reforms leading the change in the energy industry

- 2016
  - Transference of resources from PEMEX to CENAGAS
  - Administrative regulations

- 2017
  - 5-year pipeline development plan
  - Indicative power sector plan (PRODESEN)
  - Operating entities CENAGAS and CENACE
  - Secondary legislation
  - Constitutional reform
  - First and second power auctions
  - Plan for the implementation of the gas market

- 2018
  - Power capacity market
  - Gas price liberalization
  - Financial transmission rights
  - Power tariff regulations
  - Sistrangas open season
  - Effective open access to pipelines
  - Contract release program from PEMEX
  - Clean energy certificates market
  - Effective open access to pipelines

Source: IHS
CFE’s separation is key to enable private participation

CFE’s restructuring as mandated by SENER

These activities will be performed on an independent and strict legal separation basis.

- Generation
- Transmission
- Distribution
- Final consumer supply
- Fuel trading

Separation: CFE has created the following number of subsidiaries, affiliates, or entities

- Six subsidiaries
  - Gen. I–VI

- One business unit
  - CFE Nuclear

- One subsidiary
  - CFE Transmission

- One subsidiary
  - CFE Distribution

- One subsidiary
  - CFE Basic supply

- Affiliate
  - CFE Qualified supply
  - CFE Energía
  - CFE International

- One affiliate
  - CFE Legacy interconnection contracts

Source: IHS

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Further split of CFE generation is expected to reduce market power

CFE’s installed capacity accounts for 80% while its generation share is nearly 85% on Mexico’s total

<table>
<thead>
<tr>
<th>Generation</th>
<th>Total Capacity (GW)</th>
<th>Generation Share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gen I</td>
<td>7.1</td>
<td>9%</td>
</tr>
<tr>
<td>Gen II</td>
<td>9.2</td>
<td>12%</td>
</tr>
<tr>
<td>Gen III</td>
<td>6.5</td>
<td>8%</td>
</tr>
<tr>
<td>Gen IV</td>
<td>8.9</td>
<td>11%</td>
</tr>
<tr>
<td>Gen V</td>
<td>12.9</td>
<td>29%</td>
</tr>
<tr>
<td>Gen VI</td>
<td>6.5</td>
<td>8%</td>
</tr>
</tbody>
</table>

Note: LIE = Power Industry Law; Legacy permits include self-supply, cogeneration, small power producers; CFE Nuclear has 1.5 GW and has a 4% generation share. Source: IHS

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The first open season should be a first indication of the new market configuration

<table>
<thead>
<tr>
<th>Round 1</th>
<th>Round 2</th>
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<tbody>
<tr>
<td><strong>CFE and PEMEX capacity booking</strong></td>
<td><strong>Acquired rights for existing shippers</strong></td>
</tr>
<tr>
<td>Pemex and CFE will reserve the capacity required for operational needs</td>
<td>Group 1—First priority group</td>
</tr>
<tr>
<td>CRE has established the maximum amount of capacity that CENAGAS may allocate in this round as follows:</td>
<td>Gas consumers whose capacity rights will be based on the 2010 and 2011 data collection by Pemex.</td>
</tr>
<tr>
<td>- PEMEX = 1,392 MMcf/d</td>
<td>Consumer will have the right to bid capacity by injection point</td>
</tr>
<tr>
<td>- CFE = 1,121 MMcf/d</td>
<td>Total capacity will be the residual of Round 1</td>
</tr>
<tr>
<td>Capacity allocation will be based on the unit cost bid by the shippers</td>
<td><strong>Round 1</strong></td>
</tr>
<tr>
<td>Firm reserved capacity will have a contract length of one year—March 2017 to February 2018</td>
<td><strong>Round 2</strong></td>
</tr>
<tr>
<td>Contracts might be renewed for up to three years more only of the capacity effectively used</td>
<td></td>
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</table>
Despite the operation challenges, CENAGAS is expected to start operating under the capacity reserve regime shortly.

Main processes and milestones of the SISTRANGAS open season:

- **CFE and PEMEX capacity booking**
- **Acquired rights for existing shippers**
- **Capacity available for new shippers**

**Timeline:**
- **2016**
  - 27 Oct: CENAGAS to publish available capacity
  - 28 Nov: Potential shippers can submit requests for service
  - 26 Dec: Period to solve any difficulties
  - **2017**
    - 2 Jan: Evaluation of requests
    - 25 Jan: Sign of natural gas transportation agreements
    - 30 Jan: Open season results
    - 1 Mar: SISTRANGAS will start operating under the capacity reserve regime
    - 15 Mar: CRE will present a progress report

Source: IHS Energy
The new regulatory framework is moving rapidly to the “details” phase, but uncertainties remain

<table>
<thead>
<tr>
<th>Indicators of progress toward an open/competitive system</th>
<th></th>
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<tbody>
<tr>
<td>Regulatory persistence</td>
<td>• Clear goals and the willingness to learn from international experience</td>
</tr>
<tr>
<td>Rapid timeliness</td>
<td>• Aggressive, defined markers and a track record of meeting them</td>
</tr>
<tr>
<td>Industry adaptiveness</td>
<td>• Consumers, marketers, and producers are taking steps to operate effectively in the new environment; not generally obstructing this process</td>
</tr>
<tr>
<td>Technological advances</td>
<td>• A key enabler, providing for a likely much more rapid transition than in the United States and Europe</td>
</tr>
<tr>
<td>Excess pipeline capacity</td>
<td>• Especially import capability, allows system flexibility (linepack storage), enables market growth</td>
</tr>
</tbody>
</table>

Source: IHS
Remaining questions: Signposts to watch

- **Roles of CFE and Pemex**—Potentially dominant organizations in many parts of Mexico, despite capacity release

- **Operational details and unintended consequences**—Imbalance management, gas allocation, lack of storage

- **Market acceptance of firm transport capacity charges and rate uncertainty**—While much of Mexico is and will be “overpiped” for some time

- **Marketer interest longer term**—Very high for now, but…?
  - Potentially attractive margins in a developing marketplace
  - New and growing customer base
  - Sophisticated, concentrated customer base and excess pipes may quickly erode margins?
  - The greater the success in this opening, the quicker the margin erosion

- **Who will underwrite future pipeline capacity?**—Uncertain in a flush market with competitive power system

- **The real size of the pie**—Longer-term demand growth with renewables penetration, economic uncertainty, potential political change

- **Mexico will remain a demand-pull market for a long time**—Producers will not be able to “push” supply into Mexico. Discoverable, tradeable basis and market liquidity will take time to develop – if all goes “right.”
Thank You

*If you have questions about today’s presentation, please contact us!*

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