Aligning Midstream and Downstream Activities to Take Advantage of the Energy Reform


ALEJANDRO MARTINEZ SIBAJA
General Director, Pemex Industrial Transformation
Content

Pemex Industrial Transformation

Ongoing projects

New Opportunities
Domestic Market Description

- USD 49 billion market in 2015, world 3rd LPG, 6th gasoline, and 12th NG largest consumer markets
- Deficit in high value O&G products, net imports: gasoline (48%), diesel and jet fuel (29%), LPG (35%), NG (27%) and petrochemicals (38%)
- Expected growth in O&G products demand of about 3% per year for the next 5 years.
- Strategically located in North America, large northern border with the USA and a 200 km isthmus in the south that may capture the high price differential between the Pacific and the Atlantic oceans.
- PEMEX has a competitive advantage in Production & Logistics through its existing infrastructure.

Values for 2015 are annualized.
Pemex Downstream

Operating model

Project management

Input

- Non associated gas
- Associated gas
- Condensates
- Natural gas
- Natural gasolines
- Benzene
- Naphtas
- Crude oil

Processing

- Sweetening
- Cryogenics
- Fractionating
- Hydrodesulfurization
- Reforming
- Aromatic fractionation
- Reforming
- Synthesis / reaction
- Distillation
- Reforming
- Coking

Products

- Natural gas
- LPG
- Natural gasolines
- Styrene
- Xylenes
- Benzene
- Methanol
- Petrochemicals
- Gasoline
- Turbosine
- Diesel
- Fuel oil
- Lubricants
- Asphalts
- Coke
- Sulphur
- Propylene

Infrastructure

6 Refineries

9 Gas Processing Centers

2 Petrochemicals Centers

Our clients

Residential

Industrial

Power

Transportation
Pemex Industrial Transformation

Ongoing projects

New Opportunities
Overall Strategy: Maximize Economic Value

Customer/market driven organization (Pull strategy)

Guarantee competitiveness of local supply:
- Cost reduction
- Efficiency
- Safety & Reliability

Short term

Mid term

Increase competitiveness of local and foreign supply:
- De-bottlenecking
- Focus on the core business
- Logistics efficiency

Long term

Expand local supply:
- Capacity expansions on existing and new assets

- Understand market needs and expectations
- Establish target markets
- Develop marketing and association strategies to maintain market share
- Cultural change and HR development
- Define efficient supply strategies

Current market conditions are forcing PEMEX into finding new approaches to deploy its strategy…
Strategy Execution and Business Opportunities

• Mexico’s Energy Reform opens new and attractive business opportunities for all players.
• Current market conditions are limiting PEMEX to capture resources.
• To deploy its strategy and maximize value creation under the new environment, PEMEX will use some of the following schemes, depending on the business case:

  a. Capture the most profitable opportunities through associations with third parties
  b. Improve liquidity through asset monetization, Fibra E, Sale & Lease-back, etc.
  c. Tolling services for non-critical operations
Ongoing Business – Downstream

- Expansion projects with the highest value and capital requirements will be accomplished through associations.
- Logistic projects will be executed through third parties and existing asset monetization.
- Non-critical operations will be divested (monetization), expanded and operated through contract/tolling services.

Value Chain

Processing
- Refineries’ upgrading projects
- Ethylene oxide derivatives
- Ultra Low Sulphur Gasolines
- Ultra Low Sulphur Diesel

Utilities
- Electricity cogeneration projects

Logistics
- Procurement of transport and storage services:
  - Ramones Phase I & II

From state-owned monopoly... → Ongoing Business → ...to a state-owned productive company
Ultra-Low Sulfur Gasolines in the National Refining System

**Specific Projects**
- Ultra Low Sulfur Gasoline (ULSG)
- Gasoline (8 new plants) to be completed by 2015

**Association Goals**
- Cadereyta Refinery: New plant. (In production)
- Madero Refinery: 2 News plants. (In production)
- Minatitlán Refinery: New plant. (In start up)
- Salina Cruz Refinery: 2 News plants. (In precommissioning)
- Salamanca Refinery: New plant. (In commissioning)
- Tula: Refinery: New plant. (In commissioning)

**Objective**
To address changes in specifications for distillate fuels, in accordance with the needs of Mexican regulation, through the development of a set of projects for the six refineries at the National Refining System.

**CAPEX**
USD 2.5 billion
Ultra-Low Sulfur Diesel in the National Refining System

Objective
Integrate the necessary infrastructure to produce Ultra-Low Sulfur Diesel in the National Refining System, and comply with national environmental regulations “Fossil fuel specifications for environmental protection”.

Association Goals
Build 5 Diesel Hydrotreater Units, 5 Sour Water Stripper Units, 4 Sulfur Recovery Units and revamp of 17 Diesel Hydrotreater Units, including the integration to existing installations and needed Auxiliary Services in Cadereyta, Salamanca, Tula, Madero, Minatitlán and Salina Cruz Refineries, to produce ULS Diesel (December 2018).

CAPEX
USD 3.3 billion
**Water Treatment**

**Association Goals**

PEMEX has entered into a JV with Global Water Development Partners to manage, rehabilitate and modernize the entire Water Cycle Assets on all 18 sites of Pemex Industrial Transformation.

**Objective**

- The JV will run a diagnostic of each site and will establish the needs and goals for the rehabilitation and modernization of all the assets.
- All the bidding requests for these projects will be published within the first nine months of 2016; we expect the participation of the top water management companies in the world.

**Investment**

TBD. Currently being estimated via conceptual design by a world class engineering firm.
## Refineries Upgrading Projects

### Specific Projects

<table>
<thead>
<tr>
<th>Specific Project</th>
<th>Salina Cruz Refinery</th>
<th>Tula Refinery</th>
<th>Salamanca Refinery</th>
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<tbody>
<tr>
<td><strong>Objective</strong></td>
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<tr>
<td>- Provide project financing capabilities</td>
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<td>- Contribute with managerial and operating best practices</td>
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<td>- HR development</td>
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<td>- Improve project execution capabilities</td>
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<td>- Reduce project cost overrun and completion risk</td>
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<td><strong>Investment</strong></td>
<td>~ USD 4.1 billion (Class V)</td>
<td>~ USD 4.8 billion (Class III)</td>
<td>~ USD 3.4 billion (Class IV)</td>
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<td><strong>Association Goals</strong></td>
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### Objective

1. Increase distillate production by 125 tbd (>70%)
2. Recover crude processing capacity by 45 tbd (>15%)
3. Increase market share in the Pacific Coast
4. Capture coking margins (>6 USD/bbl)
5. Value creation (NPV ~ USD 1.7 billion)

### Investment

- **Salina Cruz Refinery**: ~ USD 4.1 billion (Class V)
- **Tula Refinery**: ~ USD 4.8 billion (Class III)
- **Salamanca Refinery**: ~ USD 3.4 billion (Class IV)

### Investment

- **Salina Cruz Refinery**: ~ USD 4.1 billion (Class V)
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- **Salamanca Refinery**: ~ USD 3.4 billion (Class IV)
**Objective**

- PEMEX is the only producer of ethylene oxide in Mexico, raw material for specialty petrochemicals (Ethoxylates).
- Domestic demand exceeds production of Ethoxylates.
- Business opportunities to increase production of ETO and MEG in the SE Region. Estimate CAPEX of USD 200 MM

**Investment**

TBD

**Association Goals**

JV with a major player in the market, PEMEX maintains participation proportional to its current assets/business.
Content

- Pemex Industrial Transformation
- Ongoing projects
- New Opportunities
New Business – Downstream

• Expansion projects with the highest value and capital requirements will be accomplished through associations.
• Logistic projects will be executed through third parties and existing asset monetization.
• Non-critical operations will be divested (monetization), expanded and operated through contract/tolling services.

Value Chain

Processing
Raw material conditioning

Utilities
• Hydrogen supply
• Nitrogen removal
• Dehydration and desalting of crude oil

Logistics
Logistics infrastructure network was divided in 15 subnets, main projects:
• US Border - Cempoala
• Transoceanic Corridor
• Gulf-Center System
• North System
• Peninsular System

Sales
Partnership/Tolling services for non-core operations: maintenance, suppliers, retailers, etc.

New Opportunities

From state-owned monopoly…

Ongoing Business

New business

...to a state-owned productive company
Logistics Infrastructure

Association Goals
These are the first to be developed using long term port, transport and storage contracts, thus creating the need for new infrastructure as well as new pipelines.

Objective
1. **Transoceanic Corridor**: USD 1.7 billion, 2 new pipelines (natural gas & LPG), new storage capacity for LPG, new world class port in Salina Cruz. All these in addition to current Pemex’s infrastructure: 4 pipelines, Coatzacoalcos port, storage capacity for crude, gasoline, diesel and naptha.
2. **Gulf-Center System**: USD 770 million, 199 mile (318 km) pipeline, 1,045 mb of storage capacity, port expansion in Tuxpan, all these in order to supply the biggest demand markets (Mexico City, Guadalajara and Bajio).

Annual Fee
TBD. Tolling services needs to be developed for transporting and storage services.
Logistics Infrastructure

PEMEX is looking for partners to execute and operate these projects, while PEMEX anchors them through transportation contracts.

**Objective**

3. **North System**: USD 300 million, 80 km of pipelines, 105 mb of storage capacity, to efficiently supply the third largest market and Northern Region. Approval of the Board of Directors: September 24th 2015. TSA Draft 75%.

4. **Peninsular System**: USD 350 million, 329 km of pipelines, 350 mb of storage capacity, port expansion, to efficiently supply Yucatán Peninsula and Cancún Area (2nd busiest airport in Mexico). Approval of the Board of Directors: September 24th 2015. TSA Draft 75%.

**Annual Fee**

TBD. Tolling services need to be developed for transporting and storage services.
Increase Natural Gas Transportation Capacity

Specific Projects
- US Border – Cempoala Pipeline

Association Goals
- PEMEX will continue developing new pipelines through third parties and JVs.
- Private companies will invest in the infrastructure and PEMEX will pay for transportation services.

Objective
- Increase by 2,000 MMcf/d in the transportation capacity, specifically to the central region of Mexico.
- Provide a new import route to replace the decrease of production in the country.
- Increase flexibility to the transportation system.

Est. Investment
- ~ USD 3,000 MM
Hydrogen Supply and Nitrogen Removal

Specific Projects
- H₂ Supply for Tula, Salamanca, Madero, Minatitlán and Salina Cruz

Association Goals
- Long term service contract
- Focus on core operations
- Reduce CAPEX requirements

Objective
- To develop a contract for H₂ supply for the clean fuels and refineries upgrading projects:
  - Tula: 86; Salamanca: 100; Madero: 45; Minatitlán: 25; Salina Cruz: 22

Investment
- > USD 400 million

N₂ Removal from Natural Gas
- The project will be developed using tolling services
- Risk sharing
- Improve project execution (time & cost)

- Additional income for gas usage which is currently re-injected into platforms (200 - 300 MMcf/d)
- Improve gas quality for pneumatic pumping
- Meet natural gas specs

- ~ USD 200 million
Partnership for Reliability Improvement and Strategic Sourcing

Specific Projects

Partnership with suppliers, technology leaders, equipment manufacturers and EPC contractors for reliability improvement and strategic sourcing

Association Goals

- Comprehensive procurement and supply strategy
- Cost reduction through economies of scale in procurement
- Joint Ventures or SPV Mechanisms
- Financing of major maintenance and rehabilitation projects
- On-time supply, by process simplification and time reduction
- Selection and development of more reliable suppliers
- Technology updates with direct and positive impact on reliability

Objective

- Increase utilization capacity of facilities
- Improve asset reliability
- Decrease unscheduled shutdowns
- Eliminate frequent failures due to obsolescence or lack of spare parts
- Reduce high energy consumption

Investment

> USD 1.0 billion
PEMEX’s Power Cogeneration Potential

Specific Projects
- Cogeneration for refineries and gas plants
  - PEMEX has developed four cogeneration projects to supply electric power to three refineries and one gas processing plant and sell it to third parties.
  - PEMEX enters as a minority partner in these projects.
  - Tula: Generating capacity of 586 megawatts and 1,150 tons/hour of steam.
  - Cadereyta: Generation capacity of 580 MW and 1,050 tons/steam
  - Salina Cruz: Generation capacity of 517 MW and 850 tons/steam
  - Cactus: Generation capacity of 633 MW and 480 tons/steam

Association Goals
- Cogeneration for natural gas system
  - PEMEX signed an MOU to form a company that shall take electricity to various control stations and natural gas measurement.
  - The system will have a capacity of approximately 72 MW, with an efficiency close to 95%.
  - The project will trigger an estimated USD 172 million and will contribute to the reduction of emission of greenhouse gases into the atmosphere, approximately 600,000 tons of carbon dioxide equivalent per year.

Objective

Investment
- ~ USD 1,400 million
- ~ USD 170 million
The conceptual part of the Mexican Energy Reform has already happened, and there are great investment opportunities.

Despite the low prices of crude oil and natural gas, demand in Mexico continues to grow so there are still great opportunities for attractive businesses.

We continue to develop and seek for new commercial and financial schemes to carry out the different business cases.

New infrastructure is needed, which represents an attractive area to do business.

PEMEX is a reliable and attractive partner for doing business in Mexico.