

Key elements of the Energy Reform and their implications for the Gas Sector from CFE's perspective

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The Energy Reform establishes a new power industry structure with multiple generators, as well as open access and a more efficient operation of the transmission and distribution networks

Generation

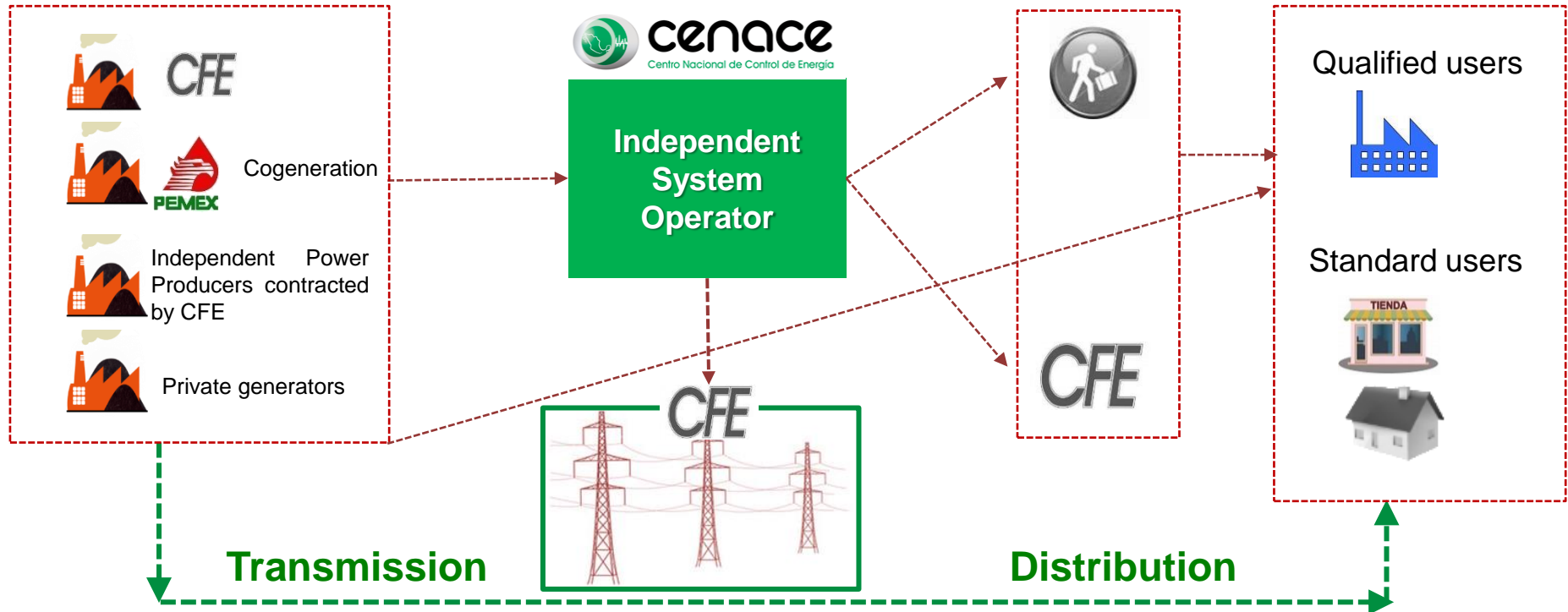
Entry barriers are eliminated and competition is enhanced, among public and private generators.

Power Dispatch and System Control

The National Center of Energy Control (CENACE) is established as an independent system operator, also in charge of managing the electricity spot market.

Commercialization

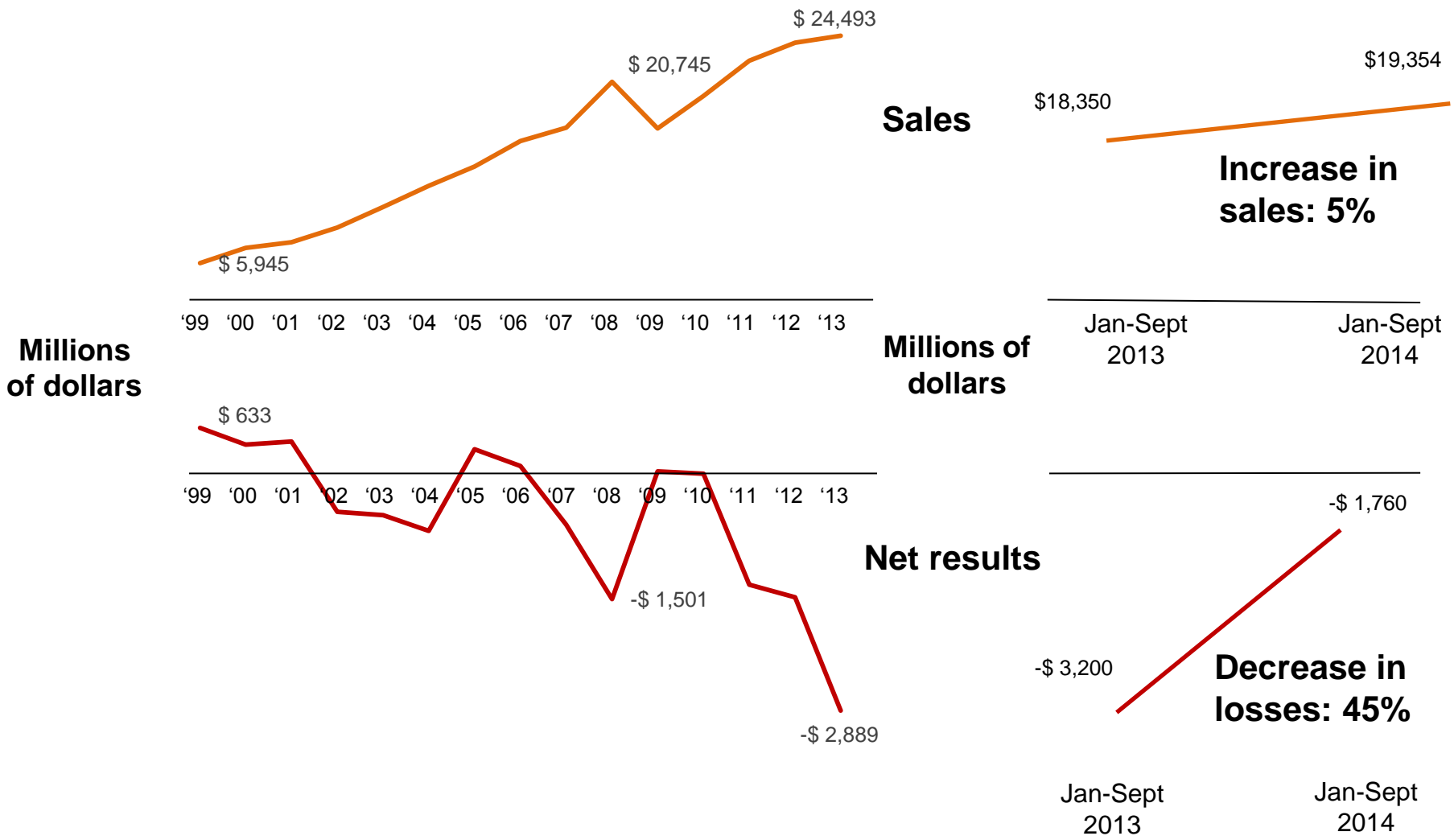
Qualified users will be able to freely agree on prices with generators through bilateral contracts. The Energy Regulatory Commission will set rates for standard users and CFE will provide the service.



CFE will be able to contract private companies to finance, operate, build and maintain the transmission and distribution networks.

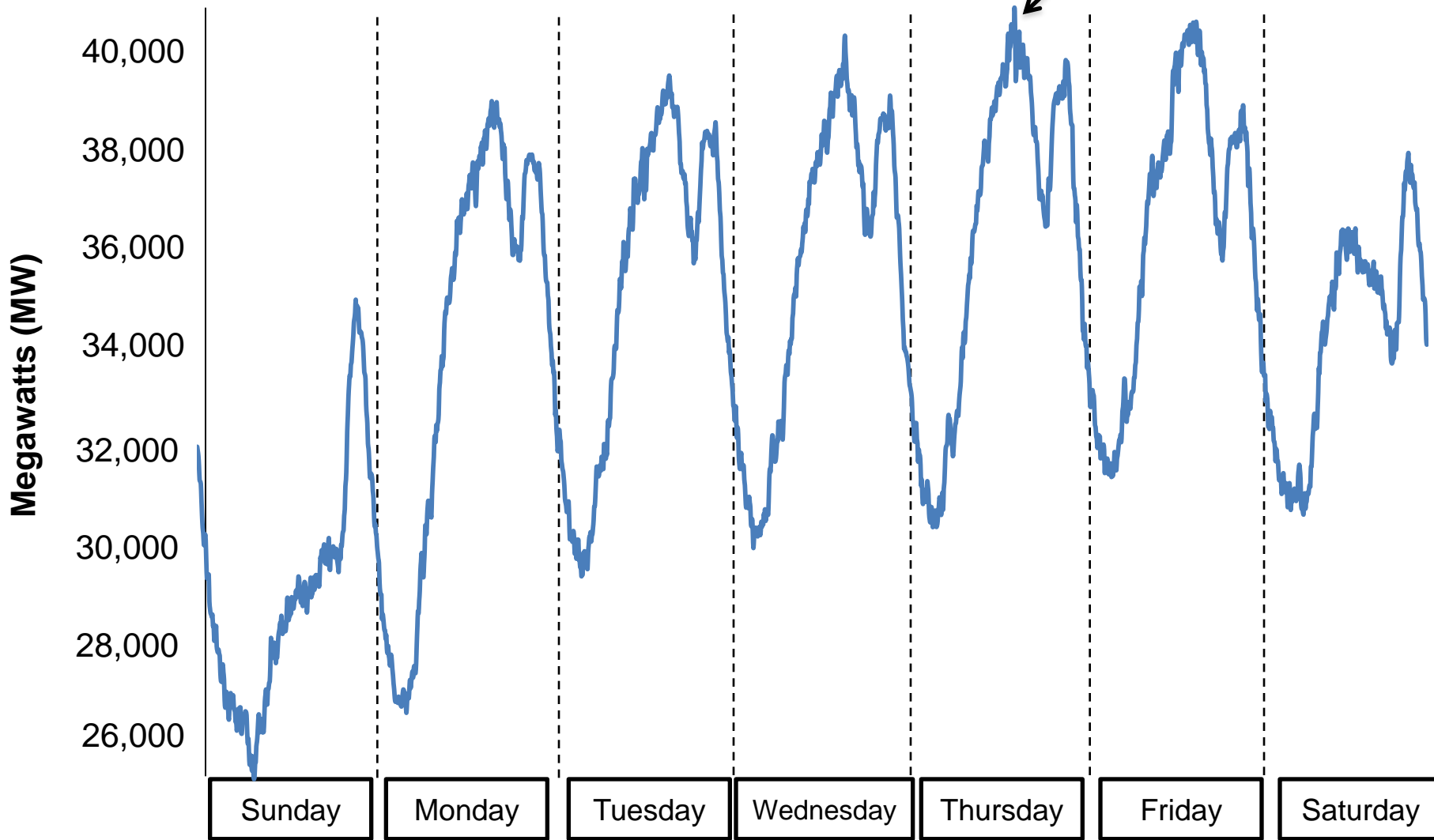


In 2013, CFE had historic sales of 24.5 billion dollars; however, it also reported a record loss of 2.9 billion dollars. As of September 2014, CFE has increased its sales by 5% and reduced its losses by 45%, compared to the same period last year



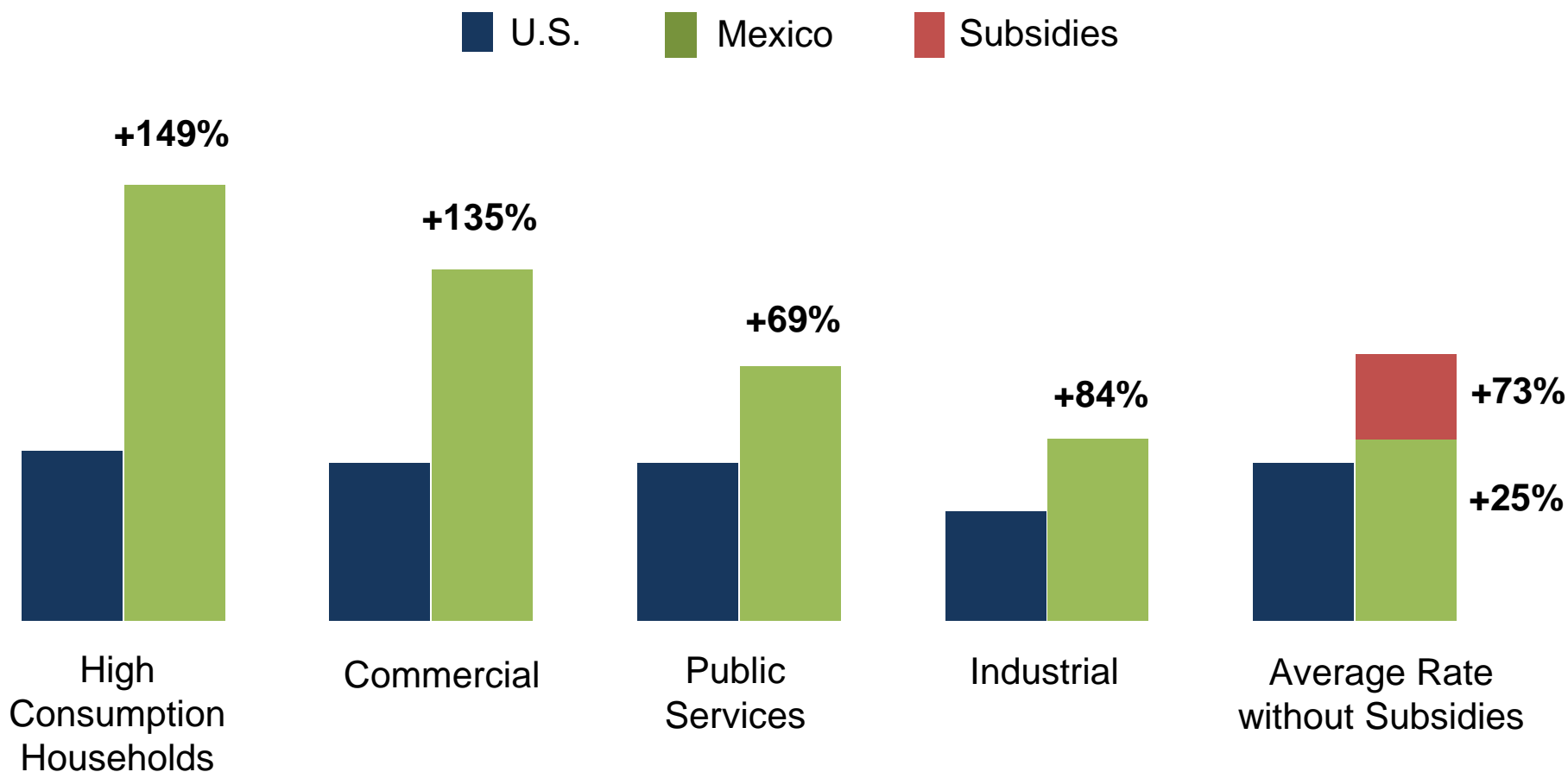
In 2014, electricity demand in Mexico peaked at almost 40,000 megawatts

June 12th, 2014, 03:41 p.m: **39,996 MW**

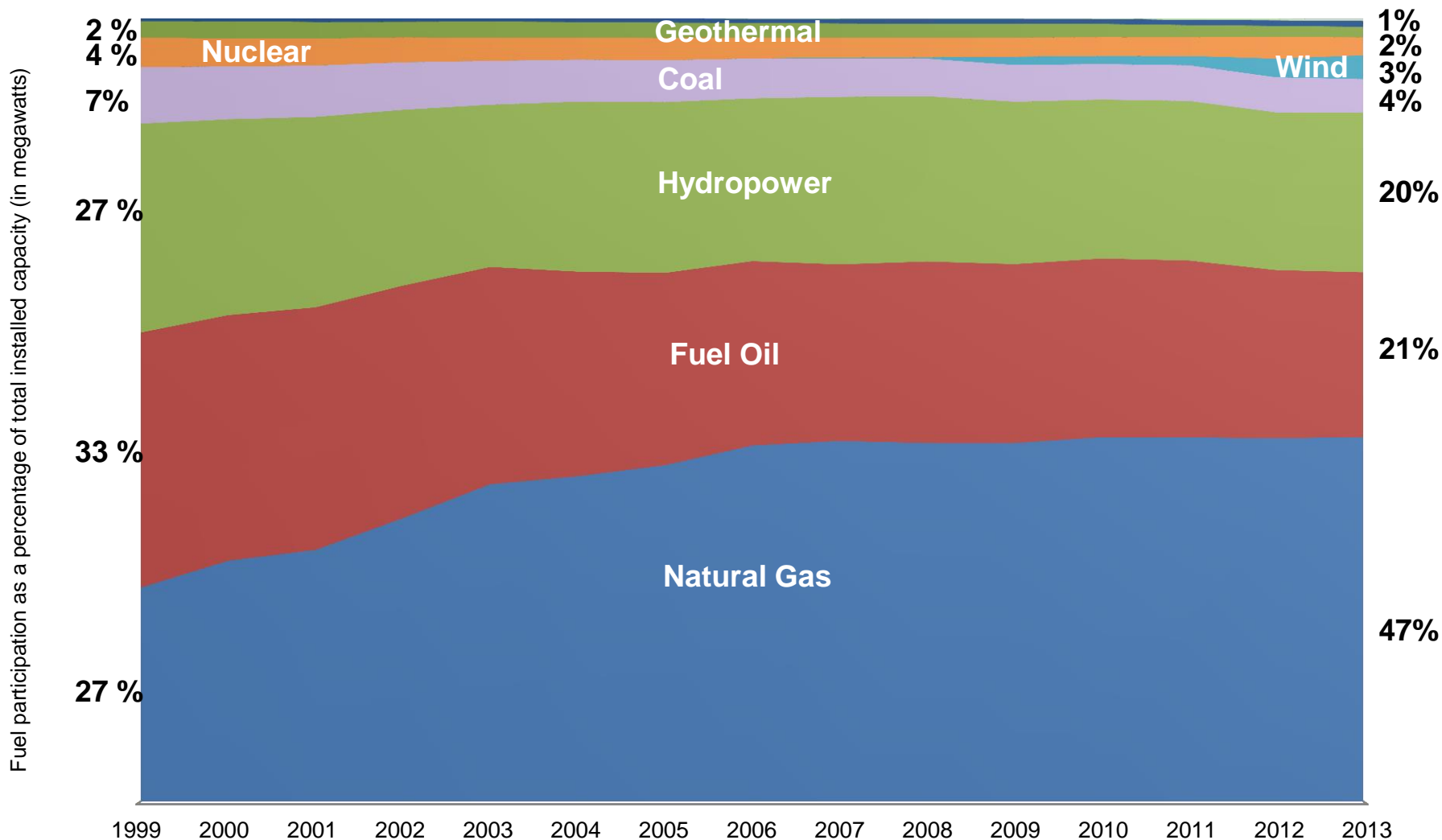


Mexico's average electricity rate is 25% higher than that of the U.S.

- Without taking subsidies into account, Mexico's average electricity rate was 73% higher than that of the U.S. in 2012.



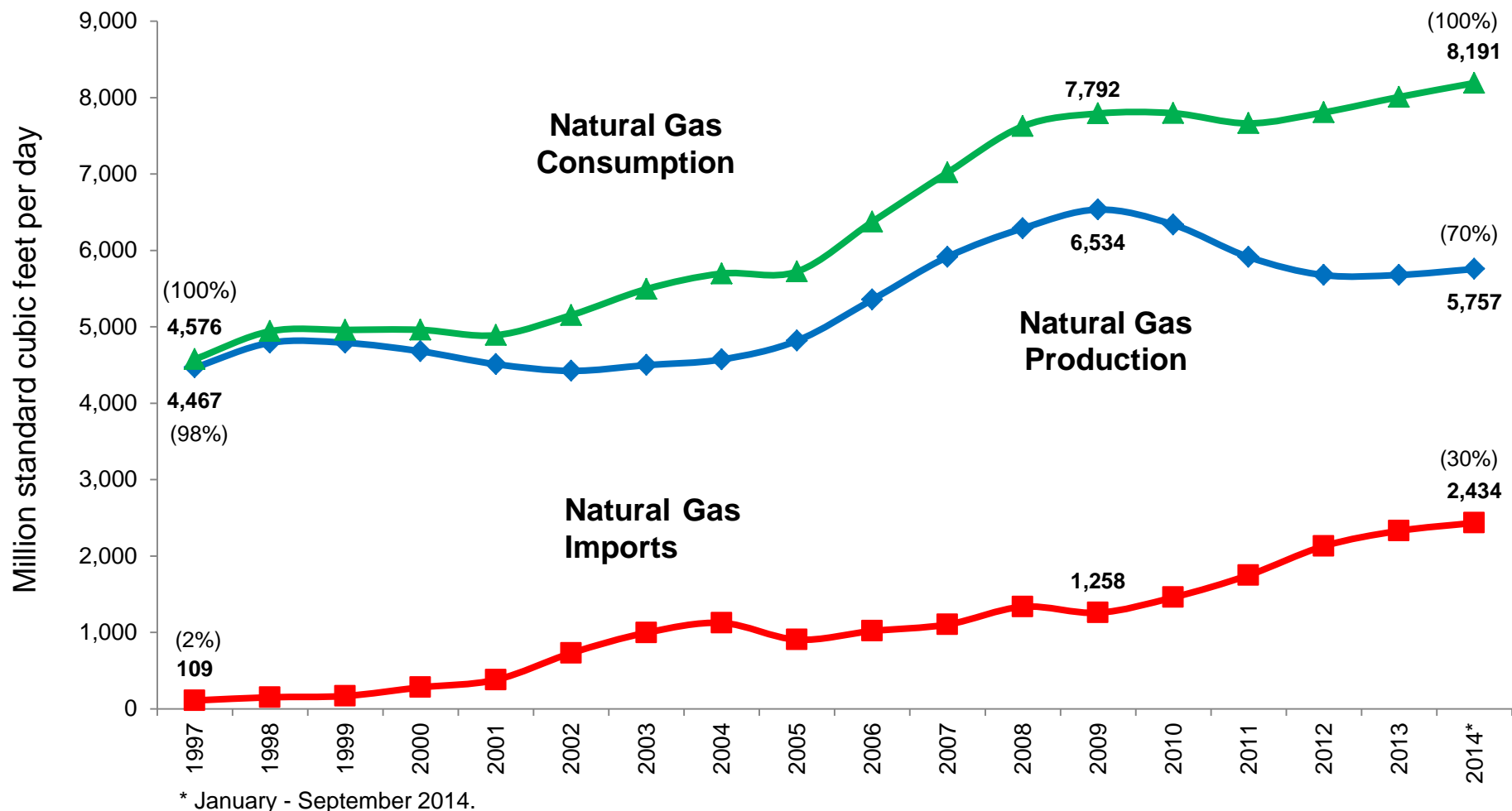
80% of the cost of electricity is determined by the price of the fuels used to generate it



Note: The graph shows the percentage of all fuels used to generate electricity in Mexico by year. This estimate is calculated in Megawatts and is based on the installed capacity of each source.

In 1999 and 2013, other fuels employed in generation processes represented 0.3% and 1% of total installed capacity, respectively.

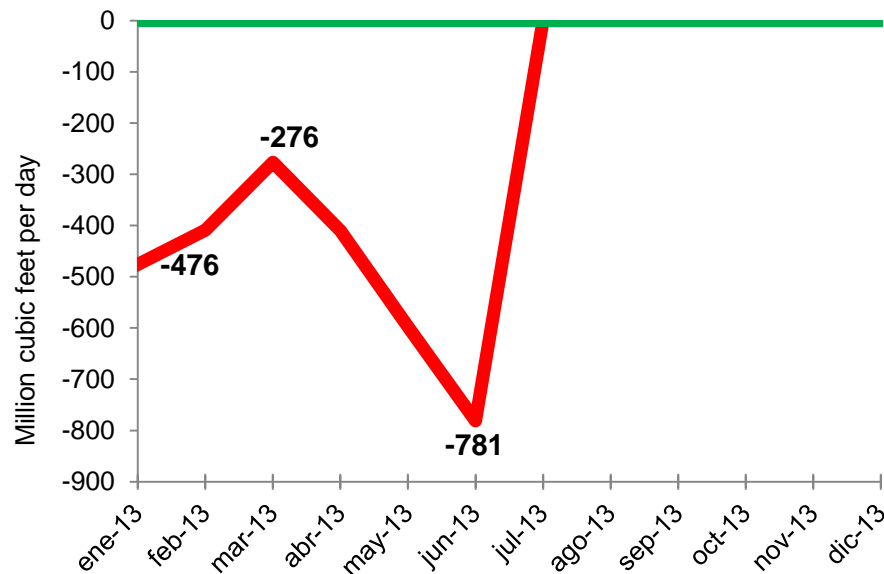
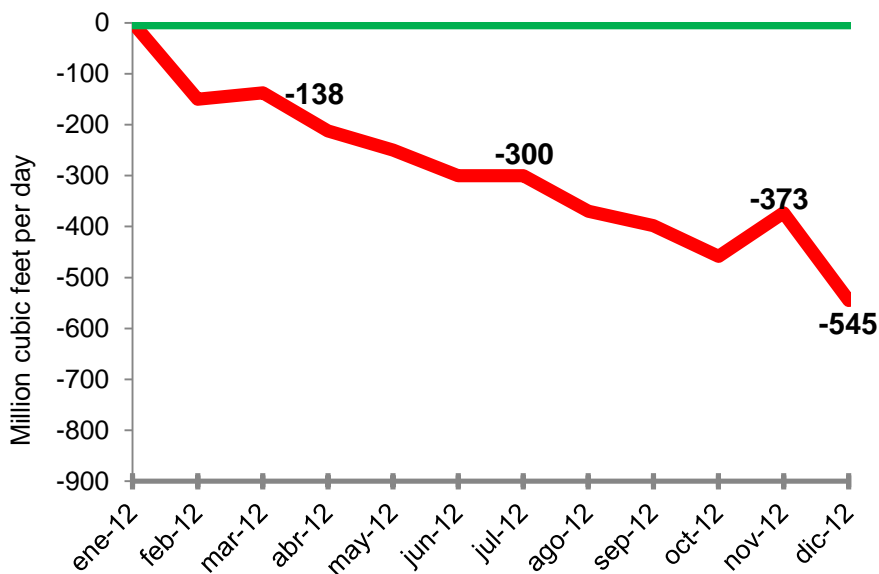
Over the last few years, natural gas production in Mexico declined, while consumption rose. This caused an increase in natural gas imports



The “Natural Gas Consumption” line reflects the addition of Pemex’s gas production and total imports. The “Natural Gas Production” line reflects Pemex’s total natural gas production, including the gas it uses in its industrial processes and the supply to final consumers.

Due to the Mexican State's coordination strategy, 16 months have passed since the last temporary natural gas consumption cap was issued in Mexico

- Between January 2012 and June 2013, 35 temporary natural gas consumption caps were issued in Mexico. **The last consumption cap ended on June 22nd 2013.**



2012: 22 consumption caps, which represented **750 million dollars** of additional generation costs.

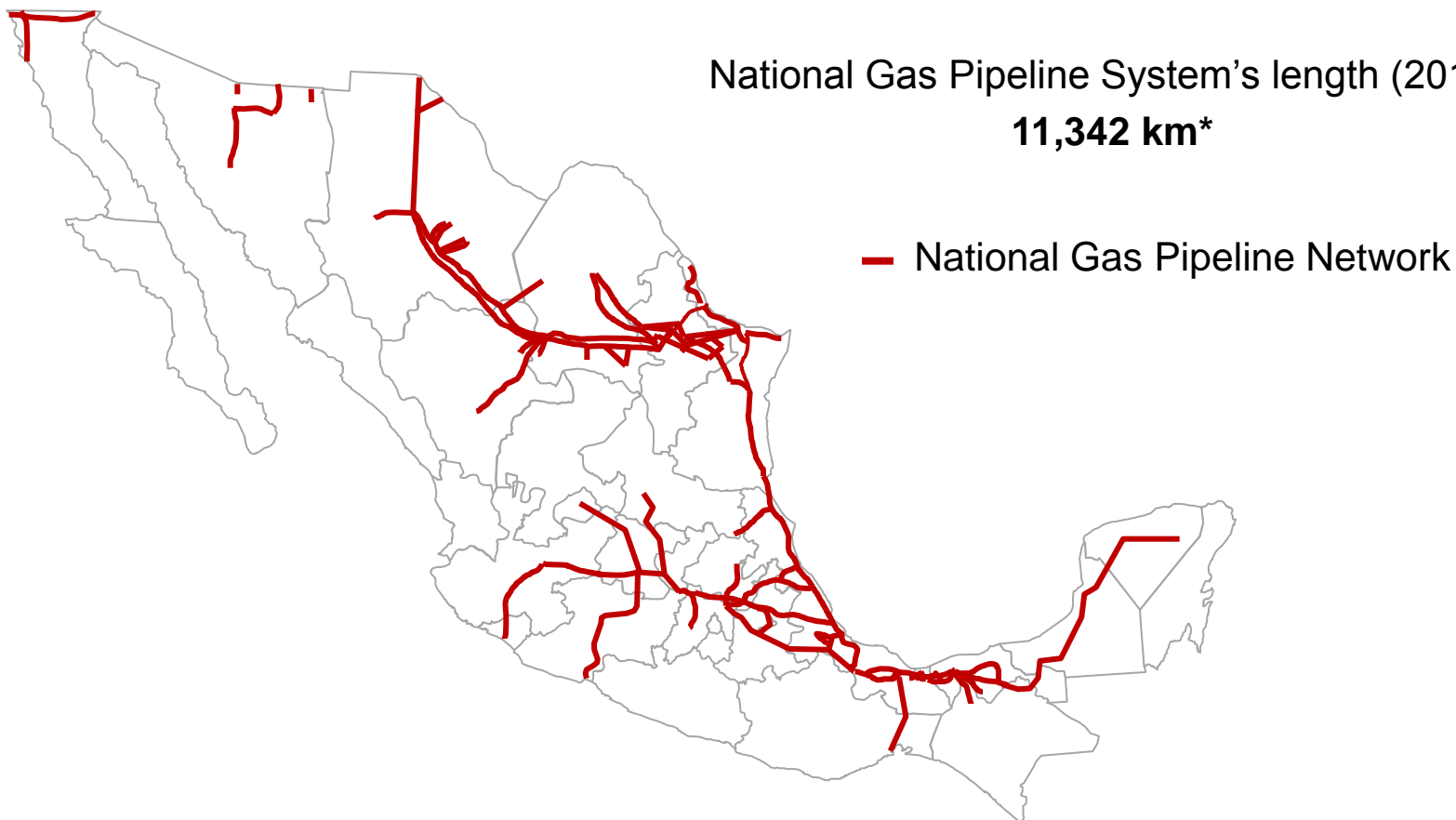
2013: 13 consumption caps, which represented **360 million dollars** of additional generation costs.

Note: Additional generation costs relate to the use of costlier fuels, due to limited availability of natural gas.

Currently, Mexico does not have sufficient infrastructure to satisfy the country's growing demand for natural gas. However, the National Infrastructure Program establishes mechanisms to cover the required infrastructure investments

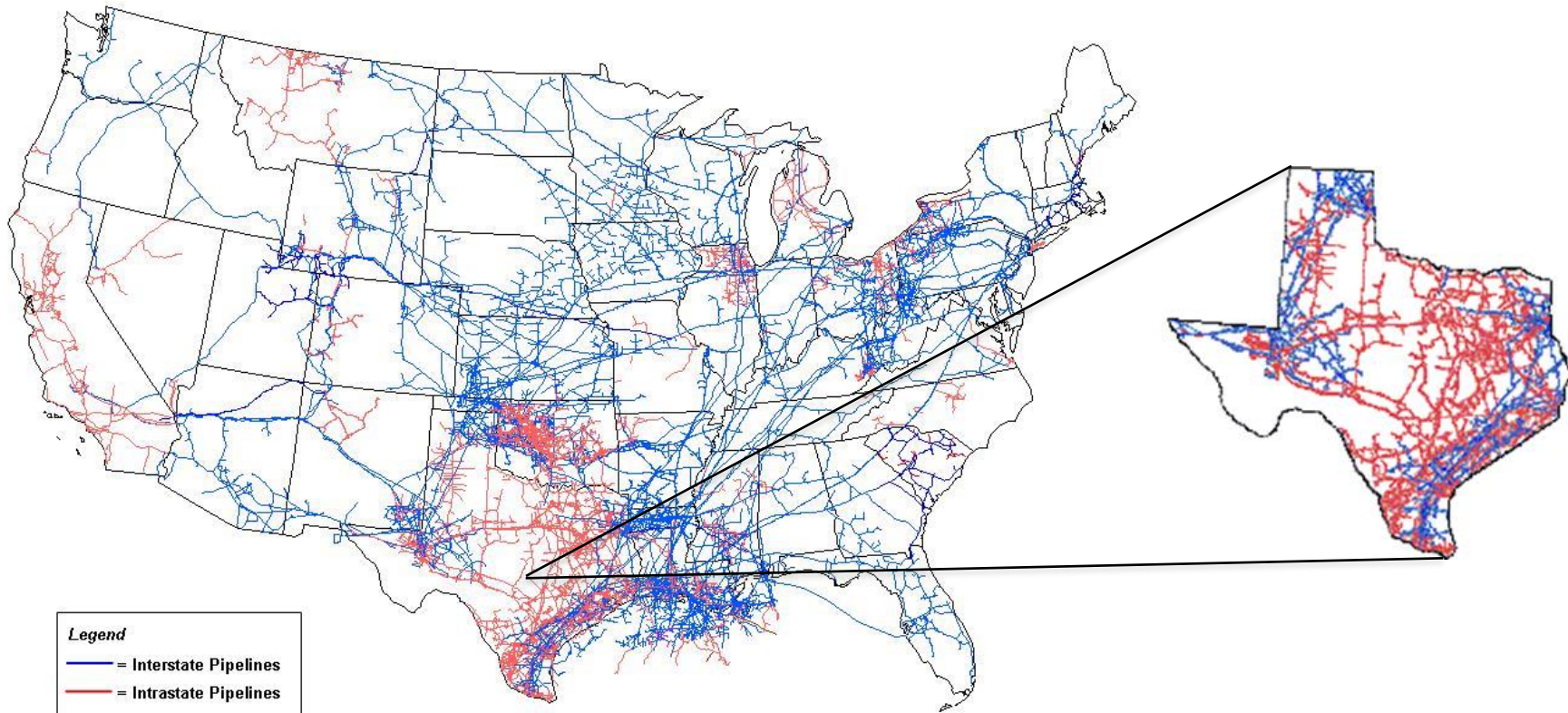
The National Gas Pipeline System faces important challenges:

- Limited transport capacity.
- Limited redundancy.
- It does not reach all States.



*This length includes Petróleos Mexicanos (Pemex) and private pipelines. It includes the 222 km pipeline from Pemex Gas y Petroquímica Básica's Jáltipan – Salina Cruz pipeline (rehabilitated in 2013). This length does not consider 383 km from the Chihuahua Pipeline, because it is part of the 2013 Integral Strategy.

The U.S. Natural Gas Pipeline Network has a length of over 492,000 kilometers, which is 43 times longer than the Mexican National Gas Pipeline System



Legend
— = Interstate Pipelines
— = Intrastate Pipelines

United States of America	
Natural Gas Pipelines	Length (km)
Intrastate	349,720
Interstate	142,665
Total	492,385

Texas	
Natural Gas Pipelines	Length (km)
Intrastate	72,420
Interstate	21,887
Total	94,307

Mexico	
Natural Gas Pipelines	Length (km)
Existing network in 2013	11,342
Integral Strategy 2013*	3,818
Announced pipelines 2014	1,217
Total	16,377

NOTE: Intrastate Pipelines.- are natural gas pipelines that only operate in one state.
 Interstate Pipelines.- are natural gas pipelines that operate in more than one state.

* The 2013 Natural Gas Integral Strategy considers projects promoted by Petróleos Mexicanos and the Comisión Federal de Electricidad. It includes 11 gas pipelines to be built in Mexico (3,818 km) and 2 in the United States (297 km).

Source: Energy Information Administration, Oil and Gas Office, Natural Gas Division, Natural Gas Transportation Information System, 2014.

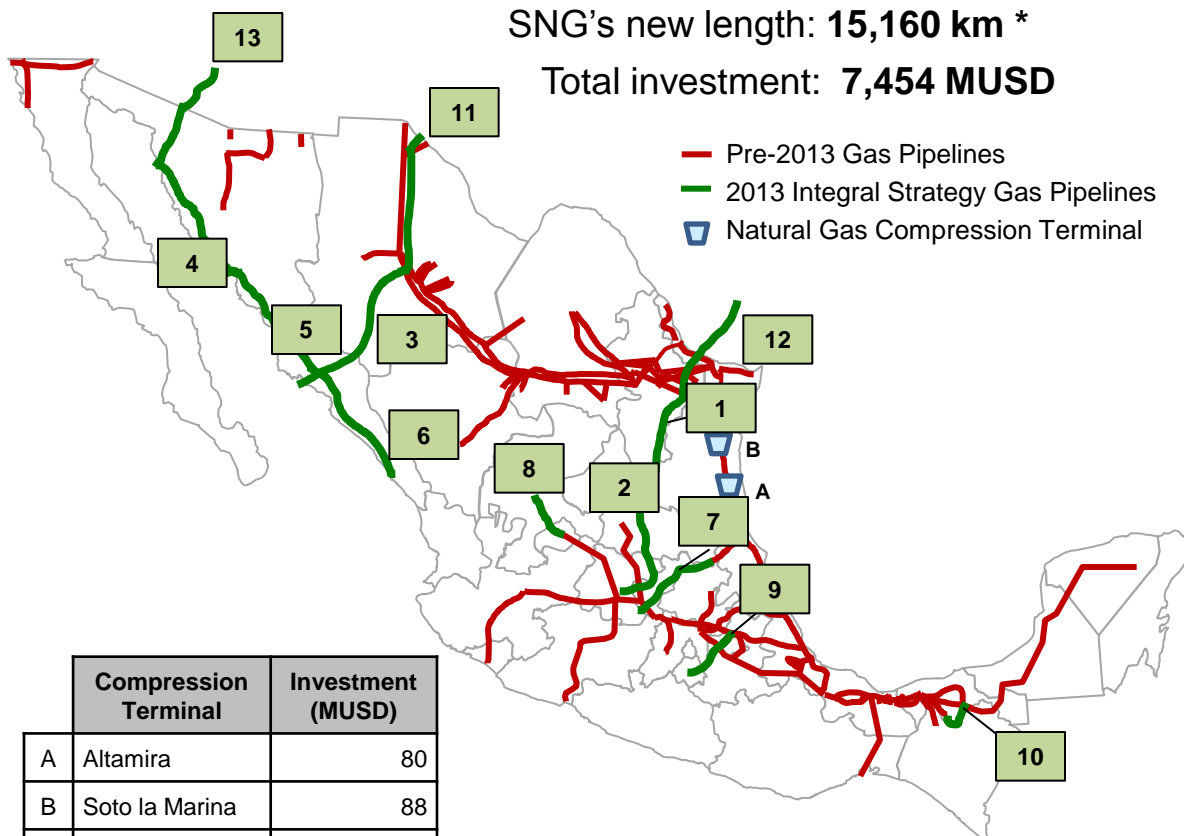
The Mexican State currently promotes the construction of projects equivalent to 34% of the National Gas Pipeline System (SNG)

- The CFE will continue to develop new routes to advance the redundancy and reliability of the natural gas transportation system.

SNG's length (2013): **11,342 km**

SNG's new length: **15,160 km ***

Total investment: **7,454 MUSD**



2013 Integral Strategy

	National gas pipelines	Length (km)	Investment (MUSD)
	Los Ramones	842	2,535
1	Ramones Fase I**	114	688
2	Ramones Fase II***	728	1,847
	North West	1,944	2,411
3	El Encino (Chih.) - Topolobampo (Sin.)	574	1,008
4	Sásabe - Guaymas	544	569
5	Guaymas - El Oro	364	429
6	El Oro - Mazatlán	462	405
	Other pipelines	1,032	1,304
7	Tamazunchale	229	468
8	Zacatecas	172	70
9	Morelos	172	246
10	Mayakán	76	125
11	Chihuahua****	383	395
	Total	3,818	6,250

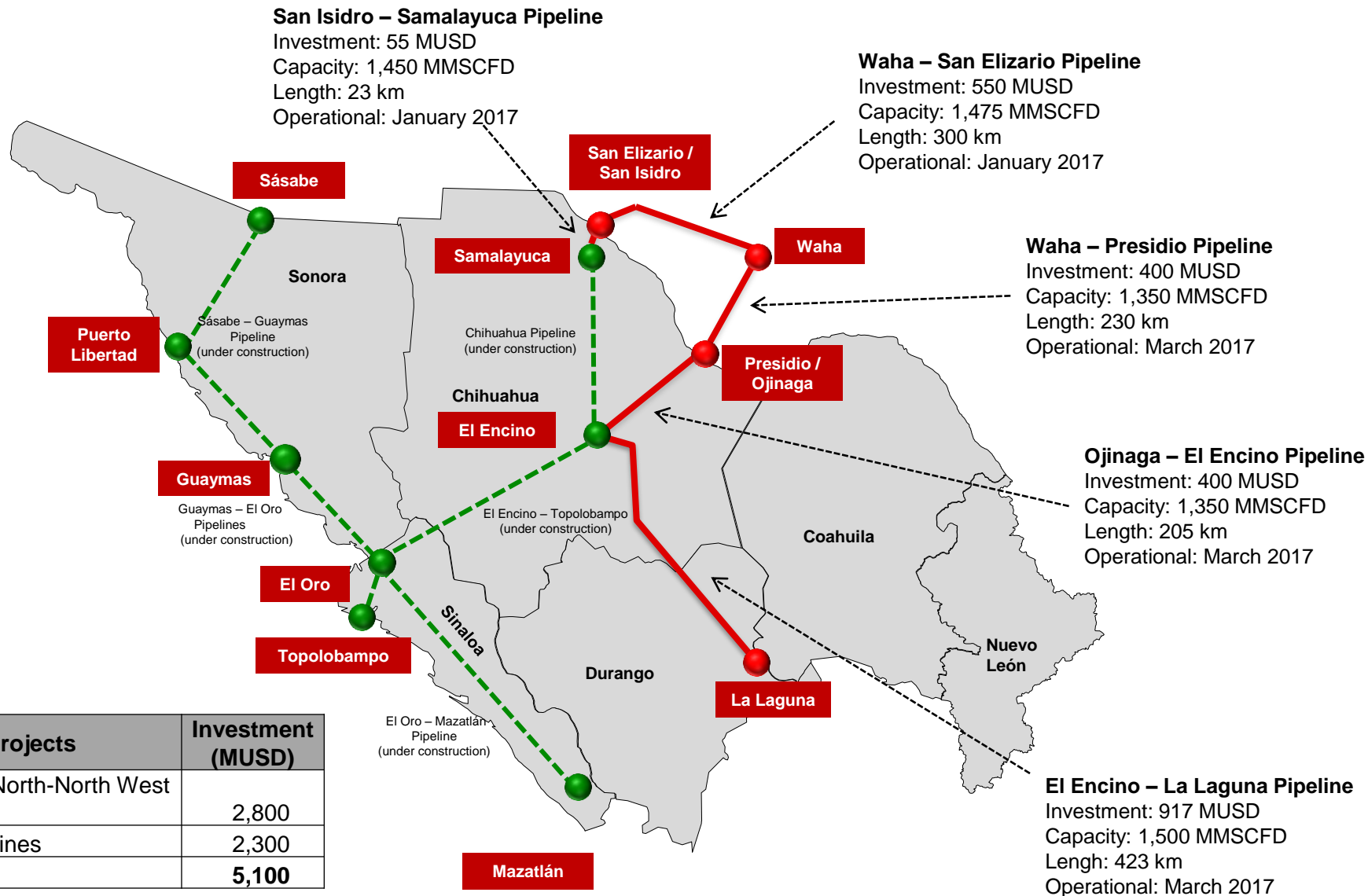
	International Gas Pipelines	Length (km)	Investment (MUSD)
12	Agua Dulce -Frontera	200	828
13	Tucson - Sásabe	97	208
	Total	297	1,036

* It includes the projects from the Integral Strategy, as well as the 222 km from the rehabilitated Jáltipan-Salina Cruz pipeline.

** Los Ramones I project considers Los Ramones Compression Terminal.

*** The Chihuahua Pipeline started to operate in July 2013.

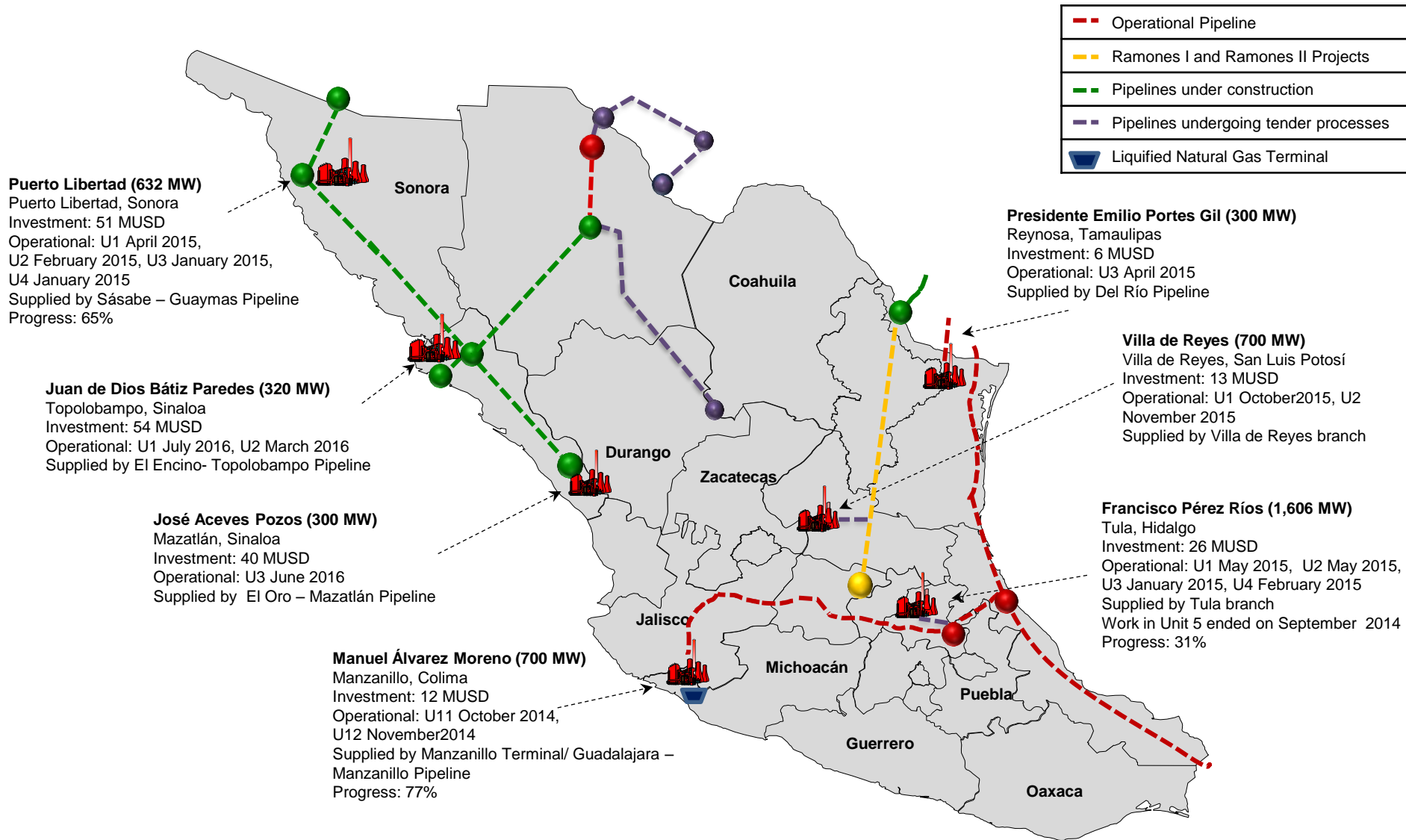
CFE promotes the construction of 5 new gas pipelines to strengthen the Integrated North- North West System and increase redundancy in the region. These projects are worth an estimated 5.1 billion dollars



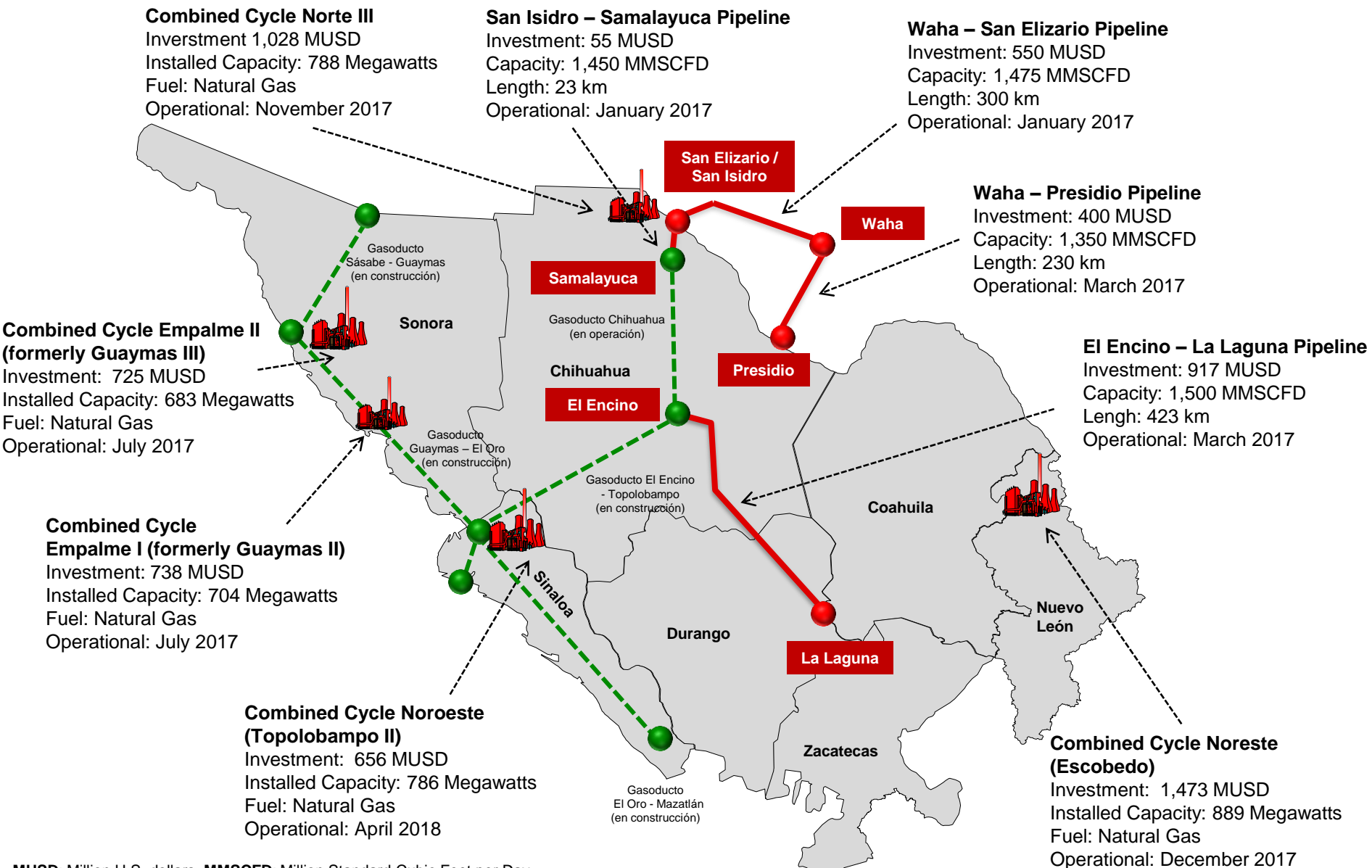
MUSD: Million United States Dollars MMSCFD: Million Stantard Cubic Feet Per Day

Source: Unidad de Promoción de Inversiones, Dirección de Modernización, Dirección de Proyectos de Inversión Financiada, Comisión Federal de Electricidad. September 2014.

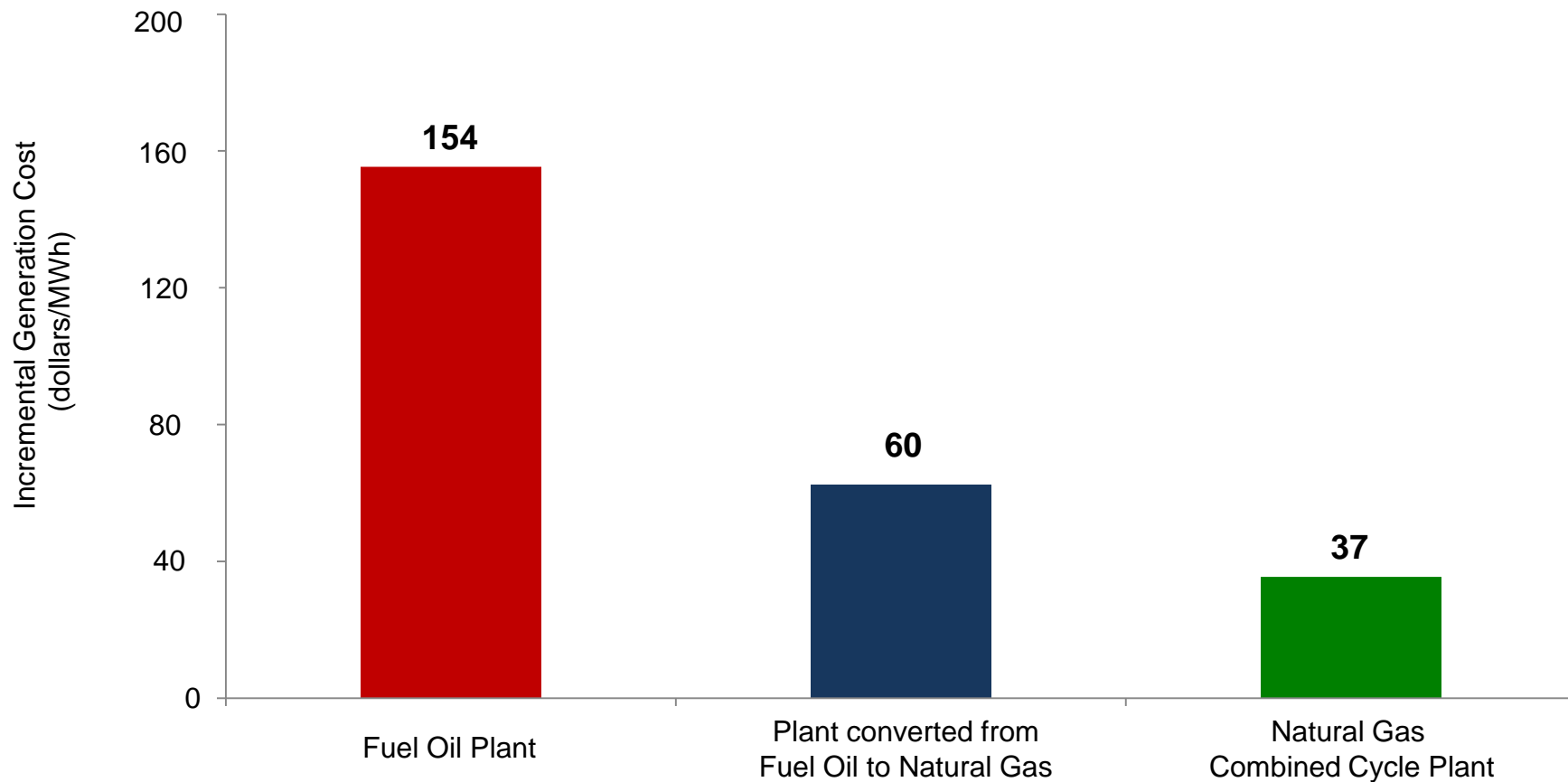
CFE is in the process of converting 7 thermoelectric power plants, that currently use fuel oil, so that they can also consume natural gas. These projects represent a 200 million dollar investment and 4,600 Megawatts of installed capacity



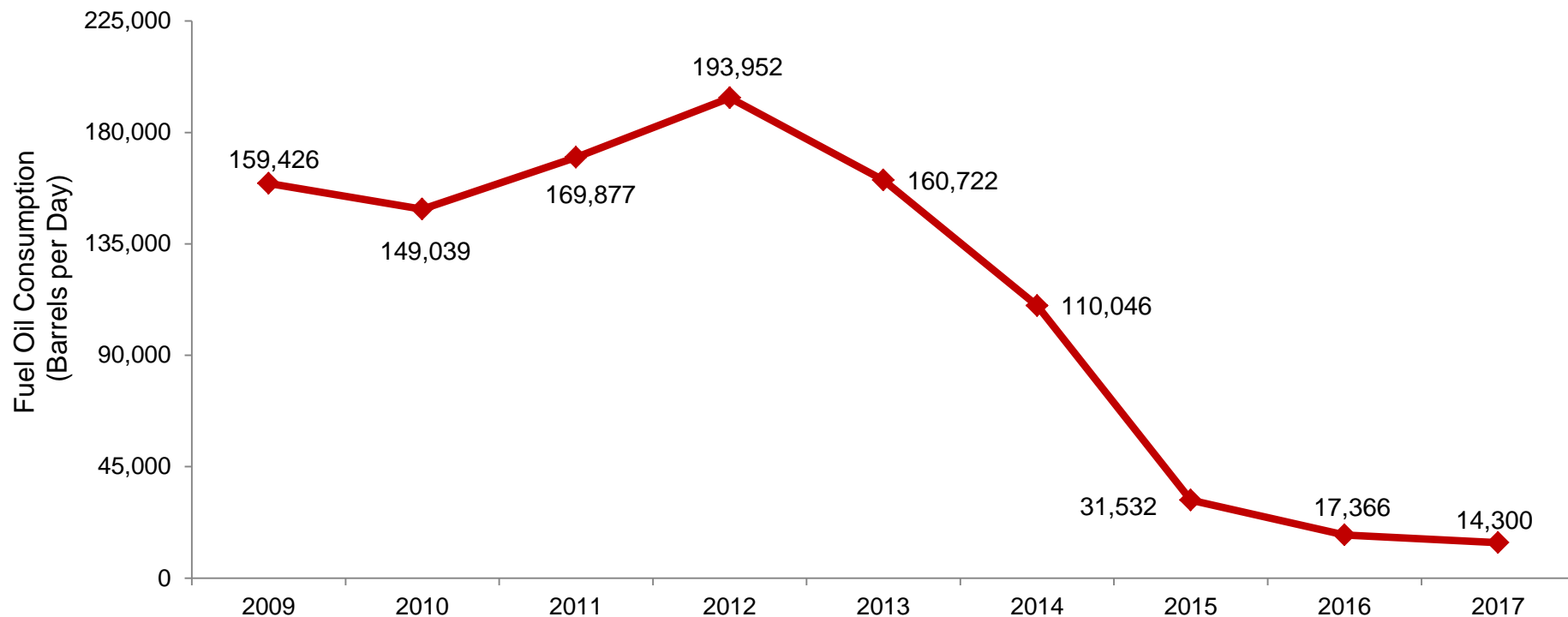
CFE promotes, with the private sector and Transparencia Mexicana, the construction of 4 gas pipelines and 5 thermoelectric power plants, worth an estimated 6.5 billion dollars



Generating electricity in a fuel oil plant is 2.5 times costlier than generating in a plant converted from fuel oil to natural gas, and 4 times costlier than generating in a natural gas combined cycle power plant



In 2012, CFE utilized 194,000 barrels of fuel oil per day to generate electricity. CFE's projections show that fuel oil consumption will decrease by 46% towards the end of 2014 and by 96% in 2017

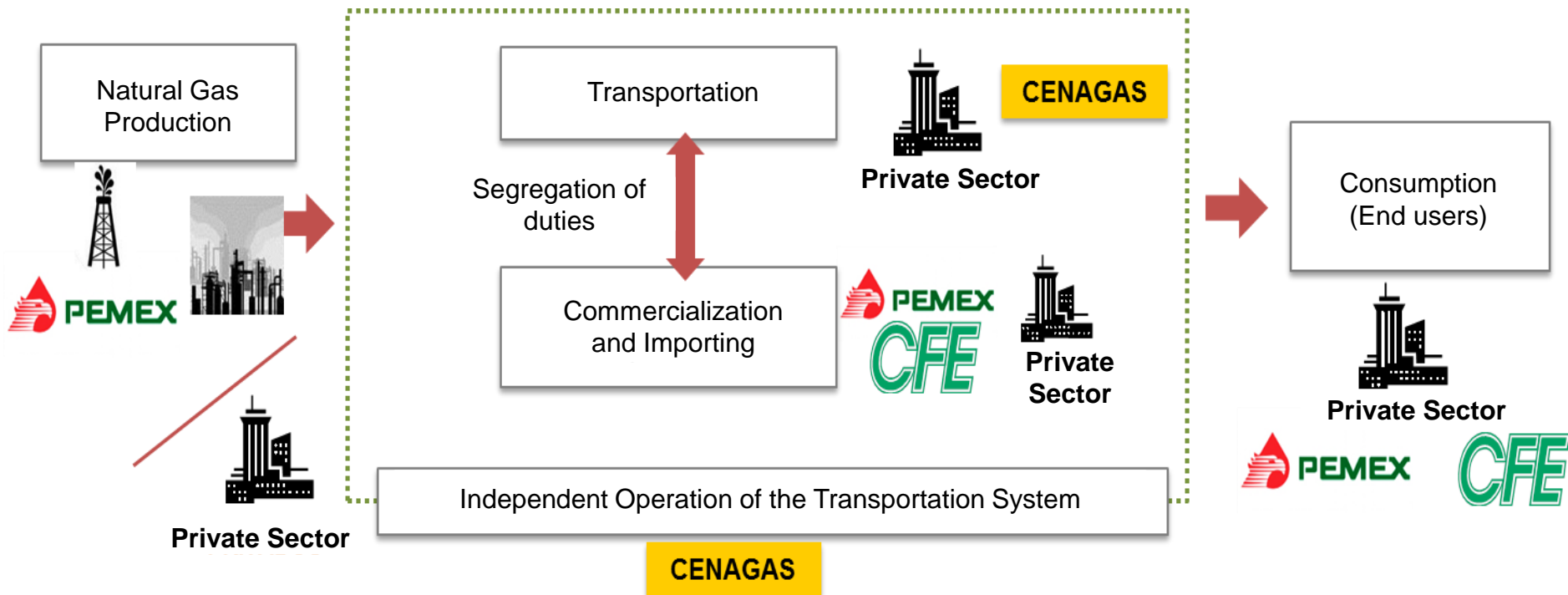


• CFE will phase out the use of fuel oil in electricity generation through 3 major initiatives:

- 1) Converting fuel oil plants so they can use natural gas.
- 2) Developing natural gas combined cycle plants.
- 3) Increasing installed capacity of renewable energy sources.

Note: For the 2009 – 2013 period, the graph shows CFE's real fuel oil consumption; for the 2014 – 2017 period, the graph shows CFE's projected fuel oil consumption.

New organization of the natural gas market: The importance of the CENAGAS



- The creation of the National Natural Gas Control Center (CENAGAS) breaks up the vertical integration of production – transportation – commercialization in the natural gas sector.
- The new industry structure guarantees universal access and effective capacity reserve in the transportation system.
- Planning process:
 - CENAGAS – Elaborates proposals
 - Energy Regulatory Commission (CRE) – Emits technical opinion
 - Energy Ministry – Requires adjustments and grants approval

Open Seasons in the Natural Gas Sector (Open access for transportation system users: Hydrocarbons Law, Chapter IV)

- **Article 69** of the Hydrocarbons Law states that strategic infrastructure projects can be developed through **open season procedures in the terms established by the Energy Regulatory Commission (CRE)**. The Energy Ministry, with technical assistance of the CRE, will verify that these projects are aligned to the national five-year Integrated Natural Gas Transportation and Storage Expansion Plan. If this is not the case, the Energy Ministry will dictate corrective actions.
- **Article 70** establishes that permit holders with idle capacity, will have to make it available through **Electronic Capacity Posting Bulletins**, enabling third parties to reserve such capacity after paying an authorized fee and meeting the technical requirements established by the Energy Regulatory Commission (CRE).
- **Articles 71 through 75** detail the regulatory framework which establishes **open access** for users interested in participating in the natural gas transportation sector.

Electronic Capacity Posting Bulletins for El Paso
Natural Gas (Kinder Morgan):<http://pipeline2.kindermorgan.com/>El Paso Natural Gas
Company, L.L.C.
a Kinder Morgan company

Informational Postings

- Capacity
 - Operationally Available
 - Unsubscribed
 - No-Notice Activity
- Gas Quality
- Index Of Customers
- Notices
 - Posted Imbalances
 - Regulatory
- Standards of Conduct
- Tariff
- Transactional Reporting
- Other
 - Downloads
 - Search
 - Customer Activities
 - Site Map

Operationally Available Capacity

Query

Summary Download

EXCEL

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TSP Name: El Paso Natural Gas Company, L.L.C. (TSP:00-800-1703)

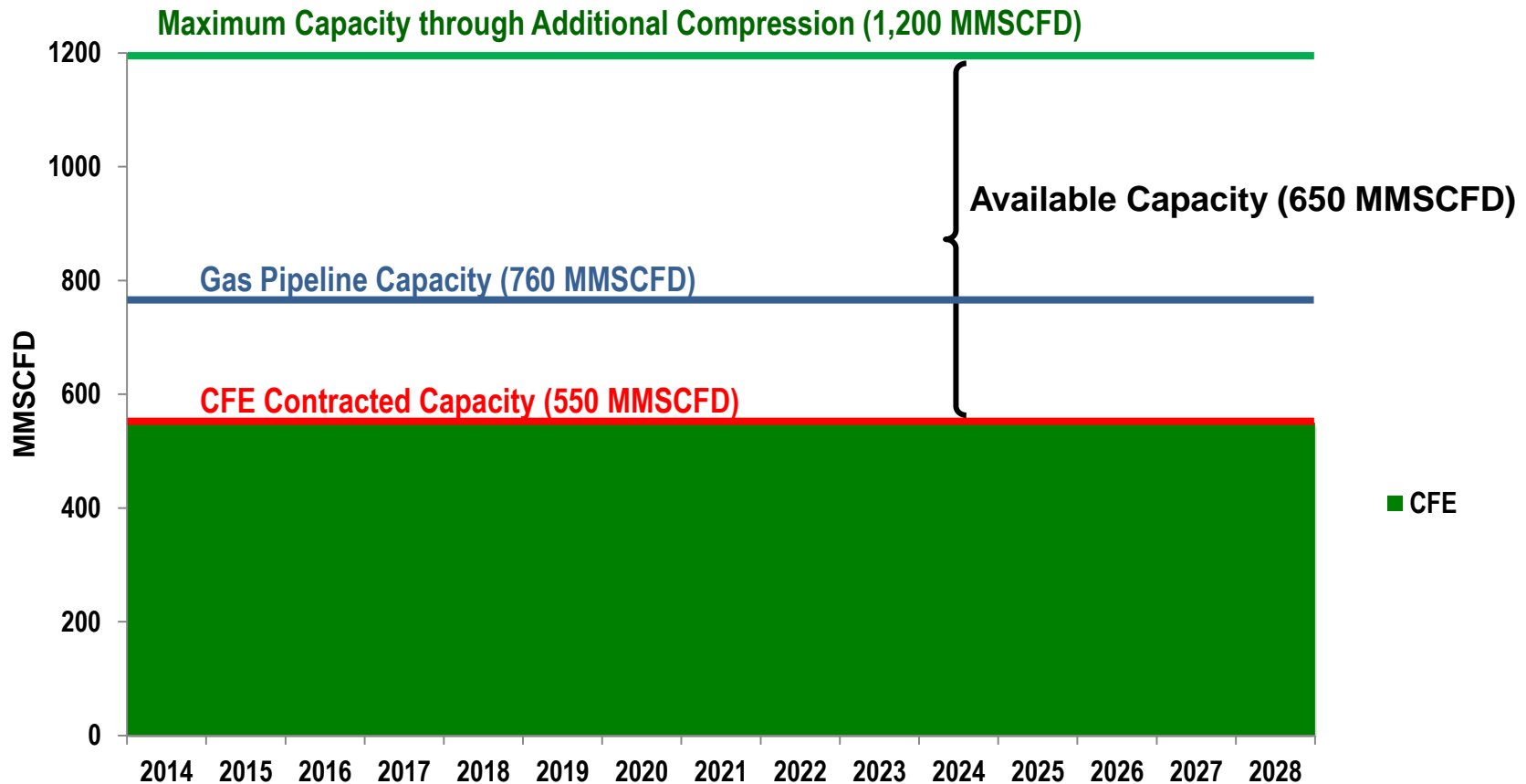
Cap Type Desc: Operationally Available Unscheduled Capacity**Meas Basis Desc: Thousand Cubic Feet****Press Base: 14.73****Press Base Desc: Pounds Per Square Inch Absolute****End Time: 9:00 AM****Meter capacities are subject to change as pressures, temperatures, and contractual commitments vary; thus, posted meter capacity values may be adjusted accordingly**

Avail Cap Eff Time	End Date	Cycle	Run	Loc Prep	Location	Location Name	Loc Zn	Loc Purp Desc	Loc/QTI Desc	Flow Ind	Region	Design Capacity	Total Scheduled Quantity	Qty Avail
09:00:00 AM	10/30/2014	Evening	FINAL	AMAR N	AMAR N	AMAR N	770	Receipt Location	Receipt point(s) Quantity	R	AMAR N	340000	0	340,000
09:00:00 AM	10/30/2014	Timely	PRELIM	AMAR S	AMAR S	AMAR S	740	Receipt Location	Receipt point(s) Quantity	R	AMAR S	340000	84,010	255,990
09:00:00 AM	10/30/2014	Timely	FINAL	AMAR S	AMAR S	AMAR S	740	Receipt Location	Receipt point(s) Quantity	R	AMAR S	340000	83,975	256,025
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09:00:00 AM	10/30/2014	Evening	FINAL	AMAR S	AMAR S	AMAR S	740	Receipt Location	Receipt point(s) Quantity	R	AMAR S	340000	84,448	255,552
09:00:00 AM	10/30/2014	Timely	PRELIM	AMARILLO	AMARILLO	AMARILLO	740	Receipt Location	Receipt point(s) Quantity	R	AMARILLO	345000	0	345,000

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Sierrita Pipeline is a branch line with the exclusive purpose of exporting gas to Mexico (Tucson, Arizona to Sásabe, Sonora). It is 30 inches in diameter and 100 kilometers in length

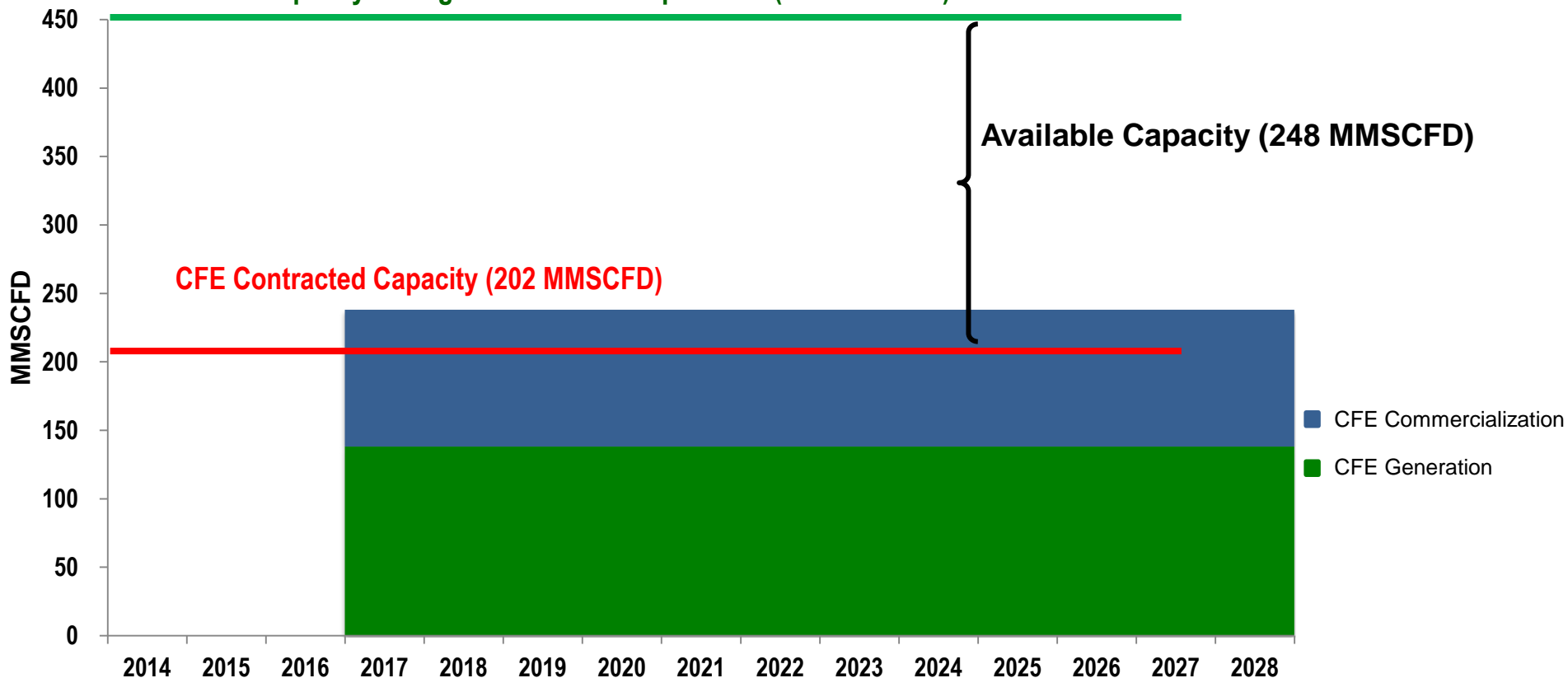


- Through additional compression, the gas pipeline's capacity can increase by 650 MMSCFD. By doing so, this system could transport enough natural gas to supply 16 additional Combined Cycle Plants of 250 Megawatts each (a 250 MW Plant consumes 40 MMSCFD).

MMSCFD: Million Standard Cubic Feet per Day

El Oro – Mazatlán Pipeline (Sinaloa) is 24 inches in diameter and 462 kilometers in length. The pipeline carrier is TransCanada

Maximum Capacity through Additional Compression (450 MMSCFD)



- Through additional compression, the gas pipeline's capacity can increase by 248 MMSCFD. By doing so, this system could transport enough natural gas to supply 6 additional Combined Cycle Plants of 250 Megawatts each (a 250 MW Plant consumes 40 MMSCFD).

MMSCFD: Million Standard Cubic Feet per day

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