

# **Petroleum History of Mexico: How it Got to Where it is Today\***

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## **Abstract**

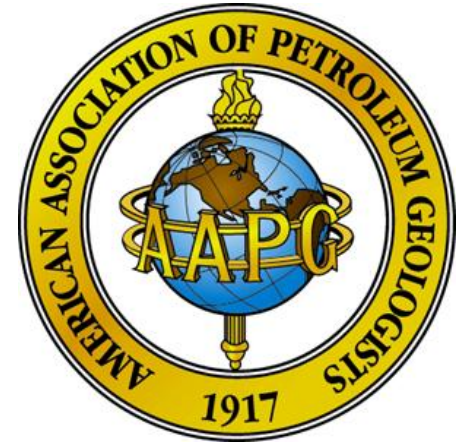
Mexico has five major hydrocarbons-producing provinces: two for oil, the Southeast and the Tampico–Misantla basins; and three for gas, the Sabinas, Burgos, and Veracruz basins. It has seven other provinces with potential: California, Gulf of Cortes, Chihuahua, Sierra Madre Oriental, Sierra de Chiapas, Progreso Shelf, and the Deep Gulf of Mexico. Nevertheless, despite this natural-rich endowment, Mexico is the only country in the world among those considered to be oil-rich that has consistently lost production and reserves in the last ten years.

Many reasons can be attributed for these results, and as this article proves, the least of them is the country's endowment of oil and gas resources. The explanation can be found in the petroleum history of Mexico. Since 1938 the country has had only one oil company responsible for all of its upstream activities. Even though Pemex's performance is comparable with that of most of the majors, it is impossible that all the remnant potential of the whole country can be found and produced through only one company, no matter how large, wealthy, efficient, technologically advanced, and successful it can be.

The understanding of the petroleum history of Mexico helps explain why the country is so unexplored and undeveloped. Significant historical aspects/features/events have been:

- the legal frame, that up to now has precluded third party-participation outside of Pemex's in the exploration activities of Mexico;
- the discovery of the supergiant onshore Mesozoic Chiapas–Tabasco and offshore Gulf of Campeche provinces in the 1970's, that took Pemex to concentrate all its resources in the development of the Southeast basin;
- the historically allocated Capex for E&P, that has been totally insufficient to allow a systematic exploration and development of the country's potential; and
- the exploration activities that have focused mostly in low-risk, extension opportunities with little expenditures allocated to test rank wildcat ones.

The results of these policies are complete basins / provinces / plays with tremendous potential untested for all practical reasons. The history, as it is being written today, allows for optimism as the country is being opened-up for third-party participation in the upstream, which will allow for spectacular results.



# The Petroleum History of México

How it Got to Where it is Today

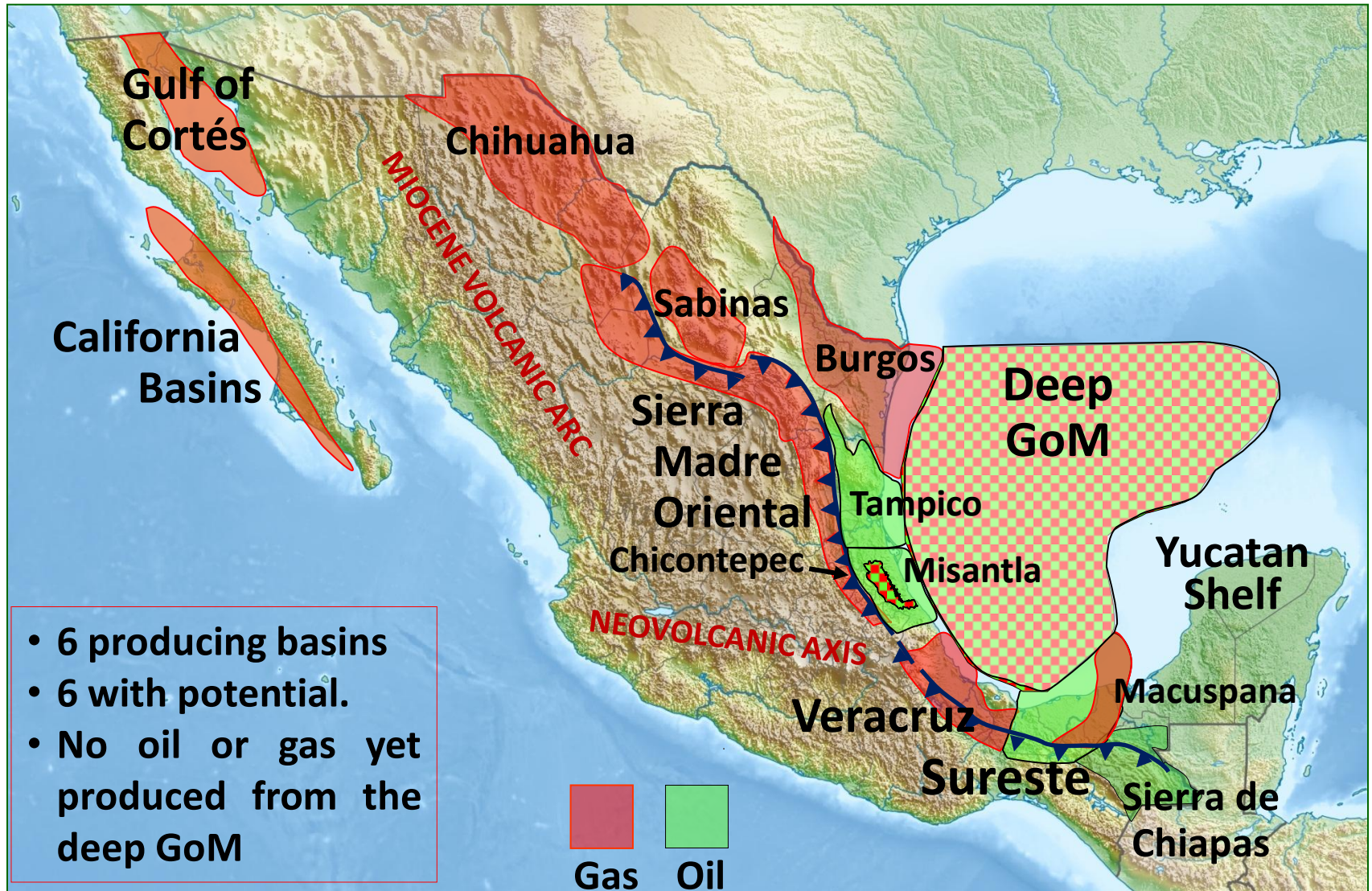


Alfredo E. Guzmán  
Cartagena de Indias, Colombia  
Sept. 2013

# The Petroleum History of México

- Some background
- Evolution of the E&P sector
- Today and the future
- Closing remarks

# Some background: México's oil and gas basins



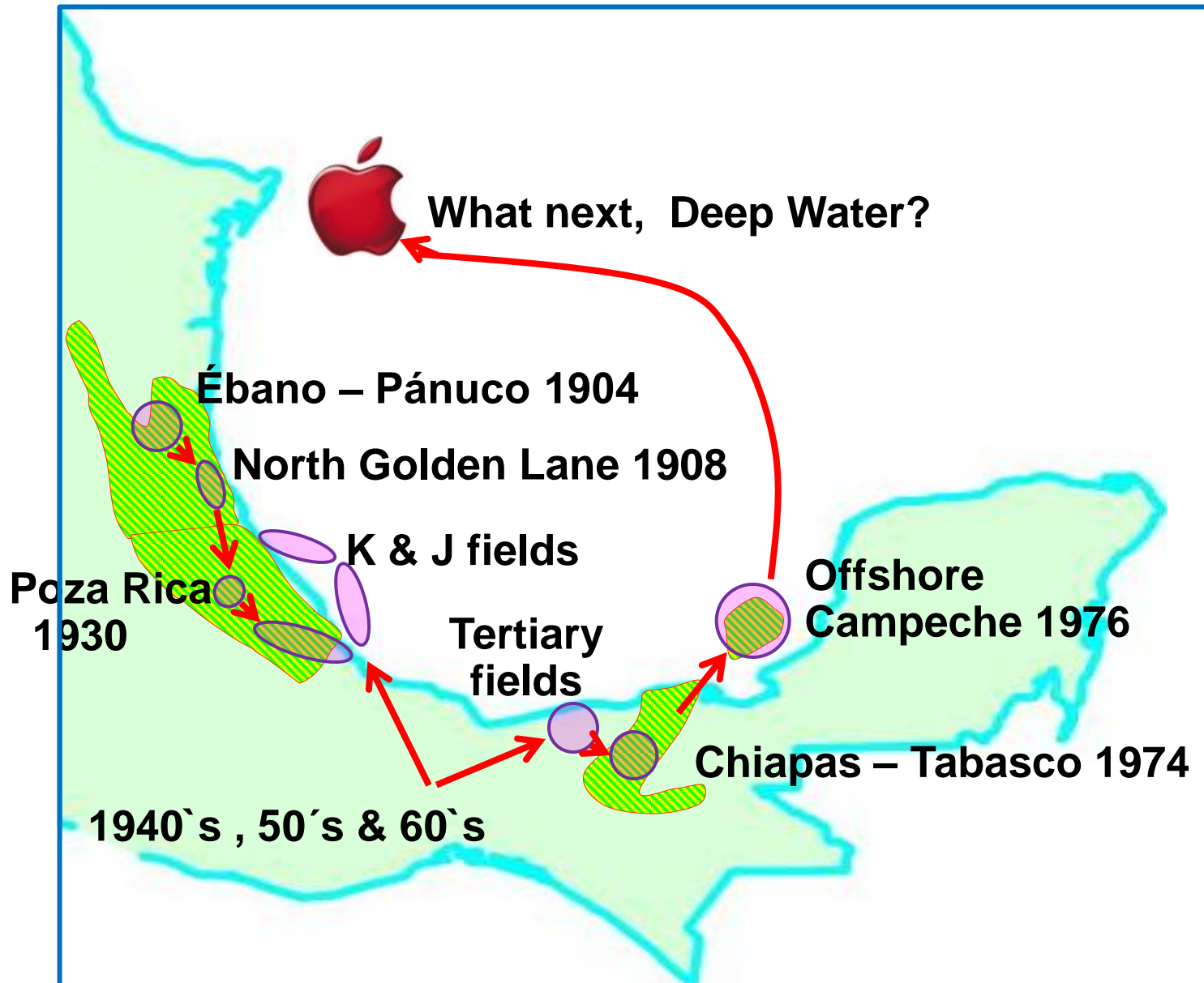


# Oil and Gas historically discovered in México

	OIL (bb)		GAS (tcf)	
<b>Discovered (OIP)</b>	263.32	100%	279.47	100%
<b>Produced</b>	40.62	15.42%	71.59	25.61%
<b>Reserves (3P)</b>	30.82	11.70%	63.23	22.62%
<b>Remnant</b>	191.88	72.87%	144.65	51.77%

# Evolution of the Petroleum Industry in Mexico

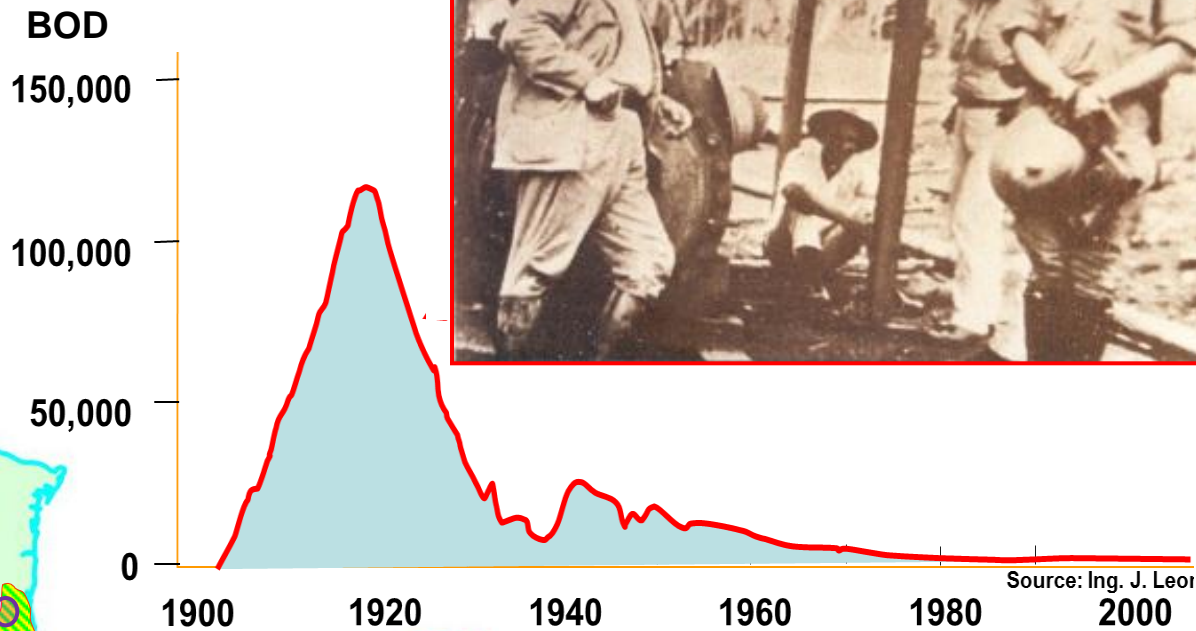
## The Syndrome of the "Bitten Apple" A. Lajous



# First Commercial Oil, April 1904

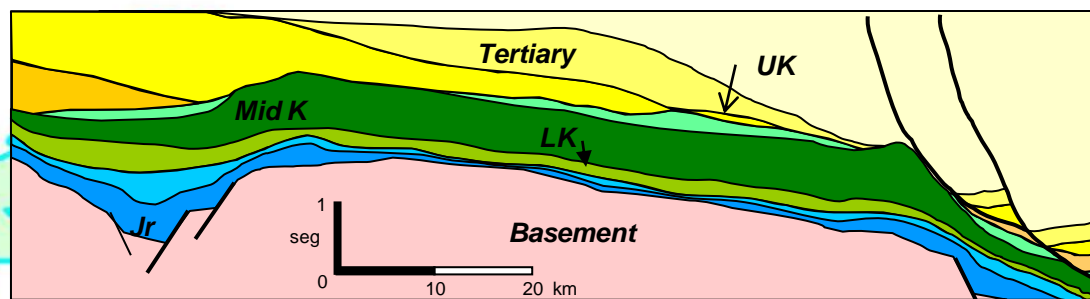
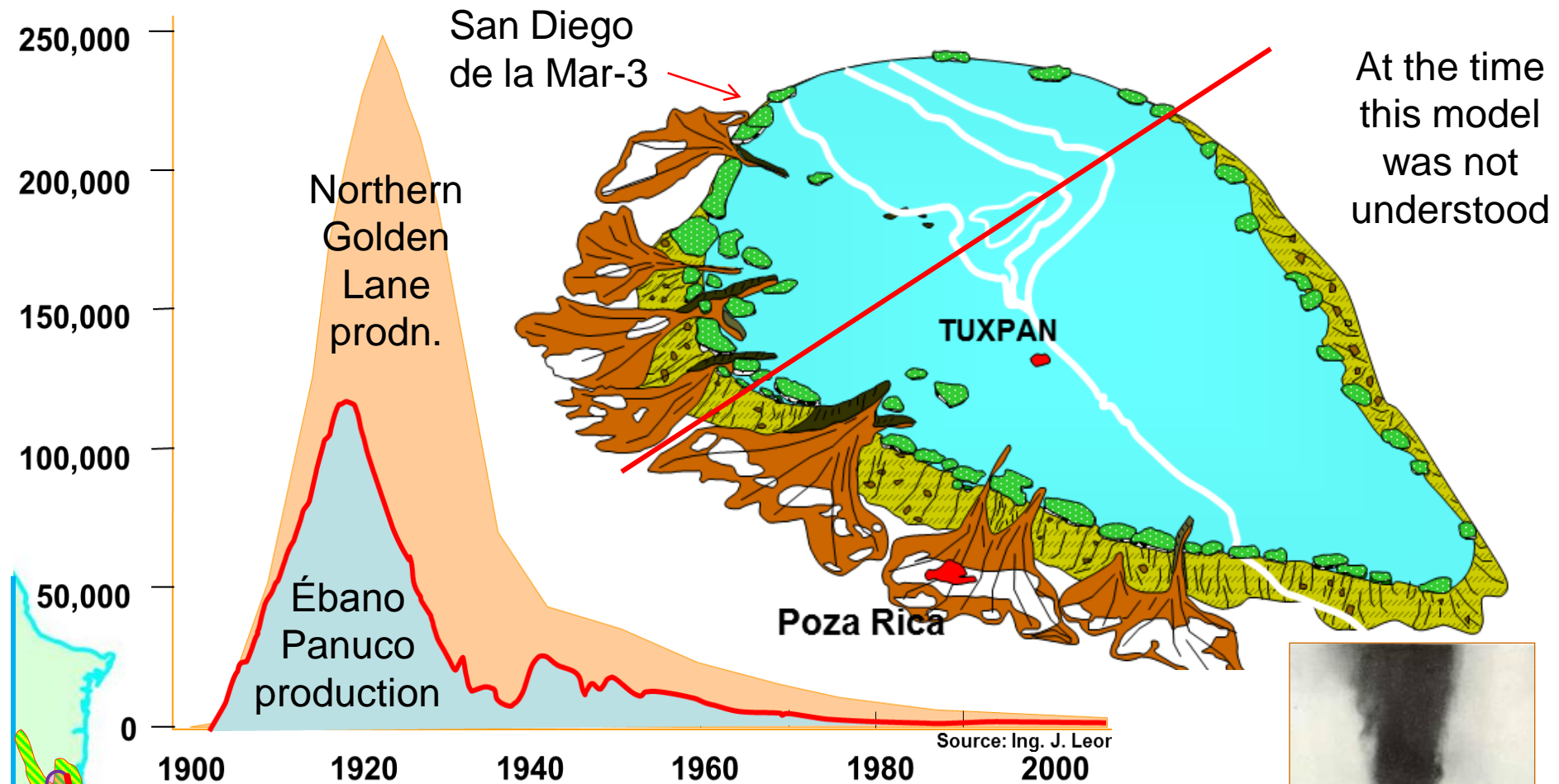
## Ébano – Pánuco Province, Tampico Basin

### Production History





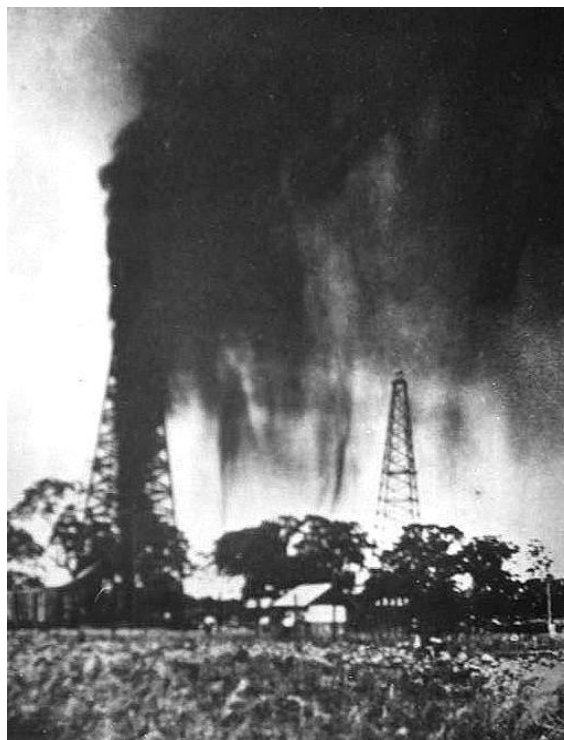
# Northern Golden Lane, 1908



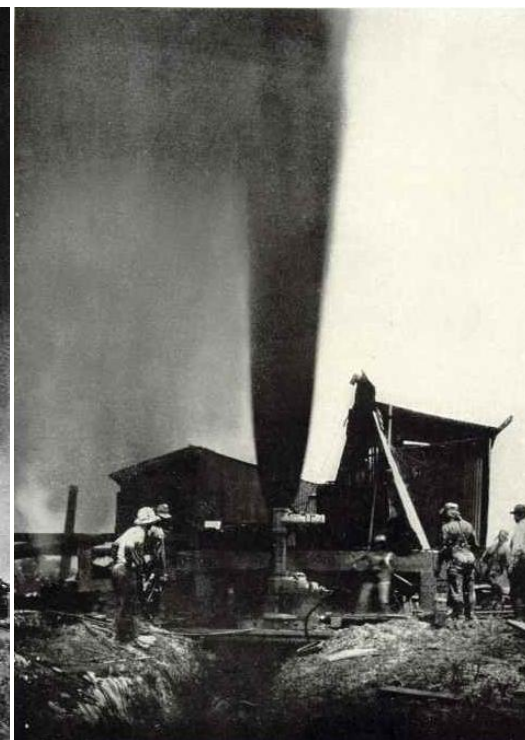
Pozo Cerro Azul – 4  
260 MBOD

# Northern Golden Lane, 1908

Pozo	Año	BOD
Cerro Azul-4	1916	260,000
Potrero del Llano-4	1910	115,000
San Diego de la Mar-3	1908	80,000
Juan Casiano-7	1910	72,000
Álamo-2	1920	45,000



**Juan Casiano - 7**



**Cerro Azul No. 4,**

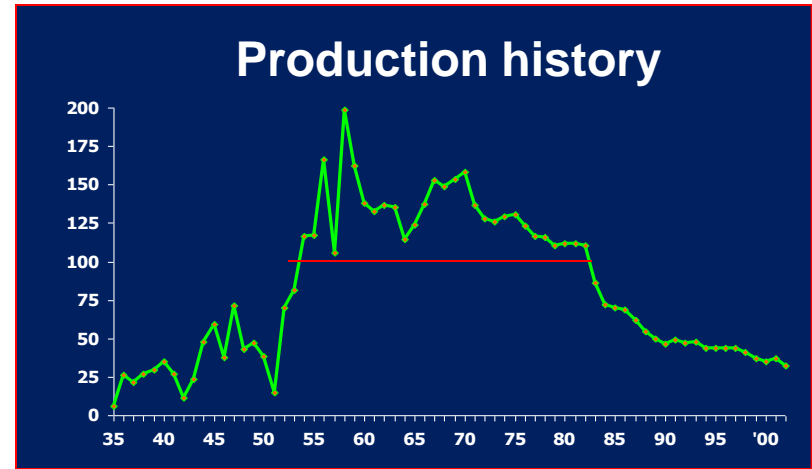
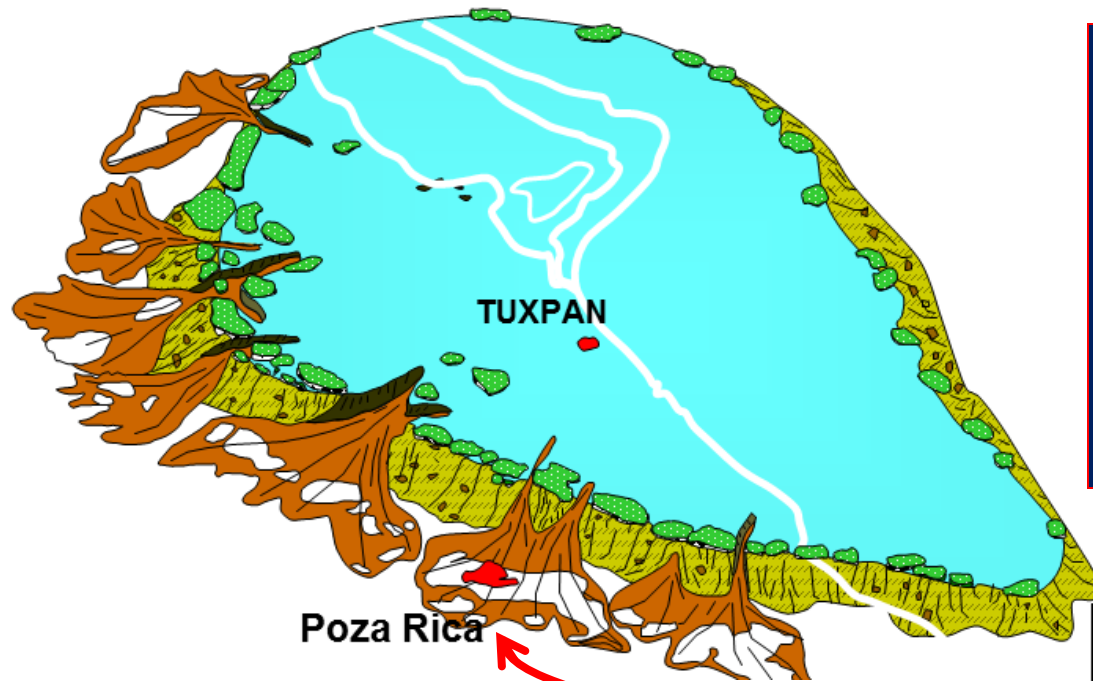


**San Diego de la Mar- 3 (Dos Bocas)**

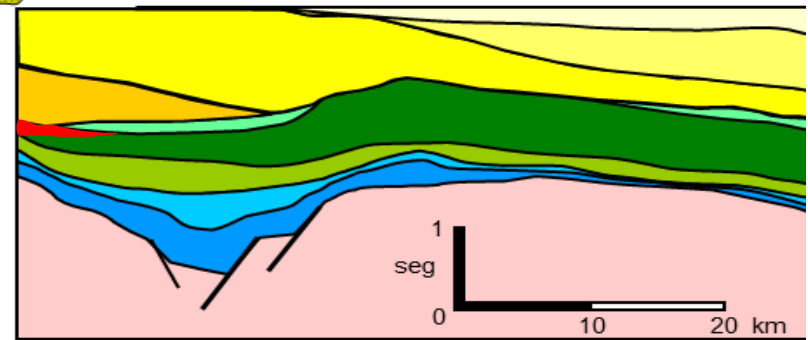
**The San Diego de la Mar N°3 well blew up and flowed through two branches creating a crater half a km in diameter**

# Poza Rica Field, 1930

One of the largest stratigraphic traps in the world in carbonate rocks



Source Pemex



**Poza Rica-2  
discovery  
well**



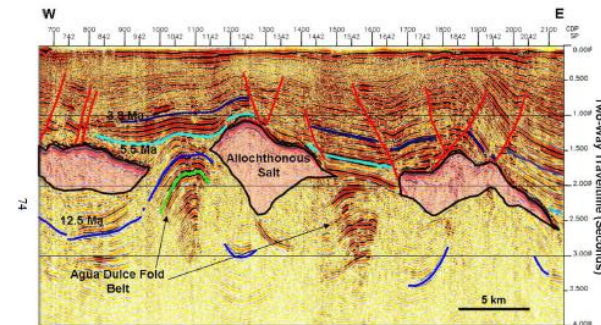
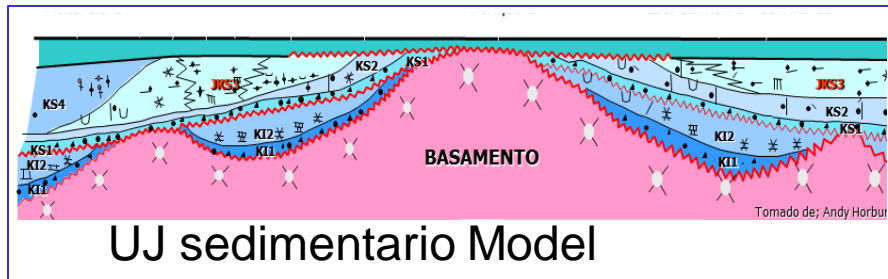
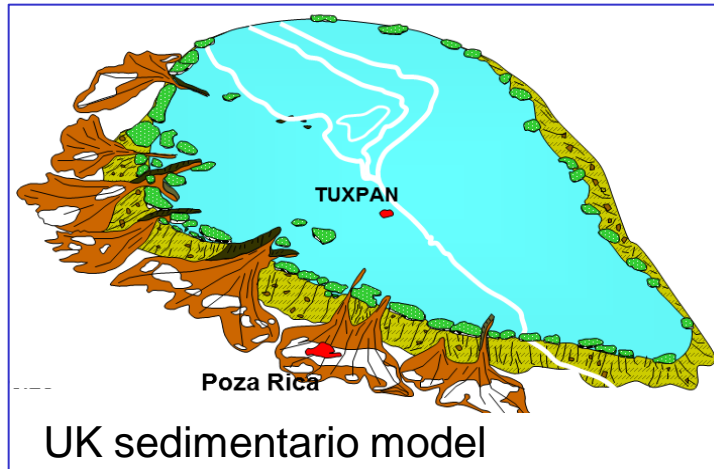
**México's production  
depended on the Poza  
Rica field for 30 years**



# The 1950' through the 1970's

Important fields were discovered in the Upper Jurassic and Middle Cretaceous of the Tampico - Misantla Basin and the Tertiary of the Sureste Basin

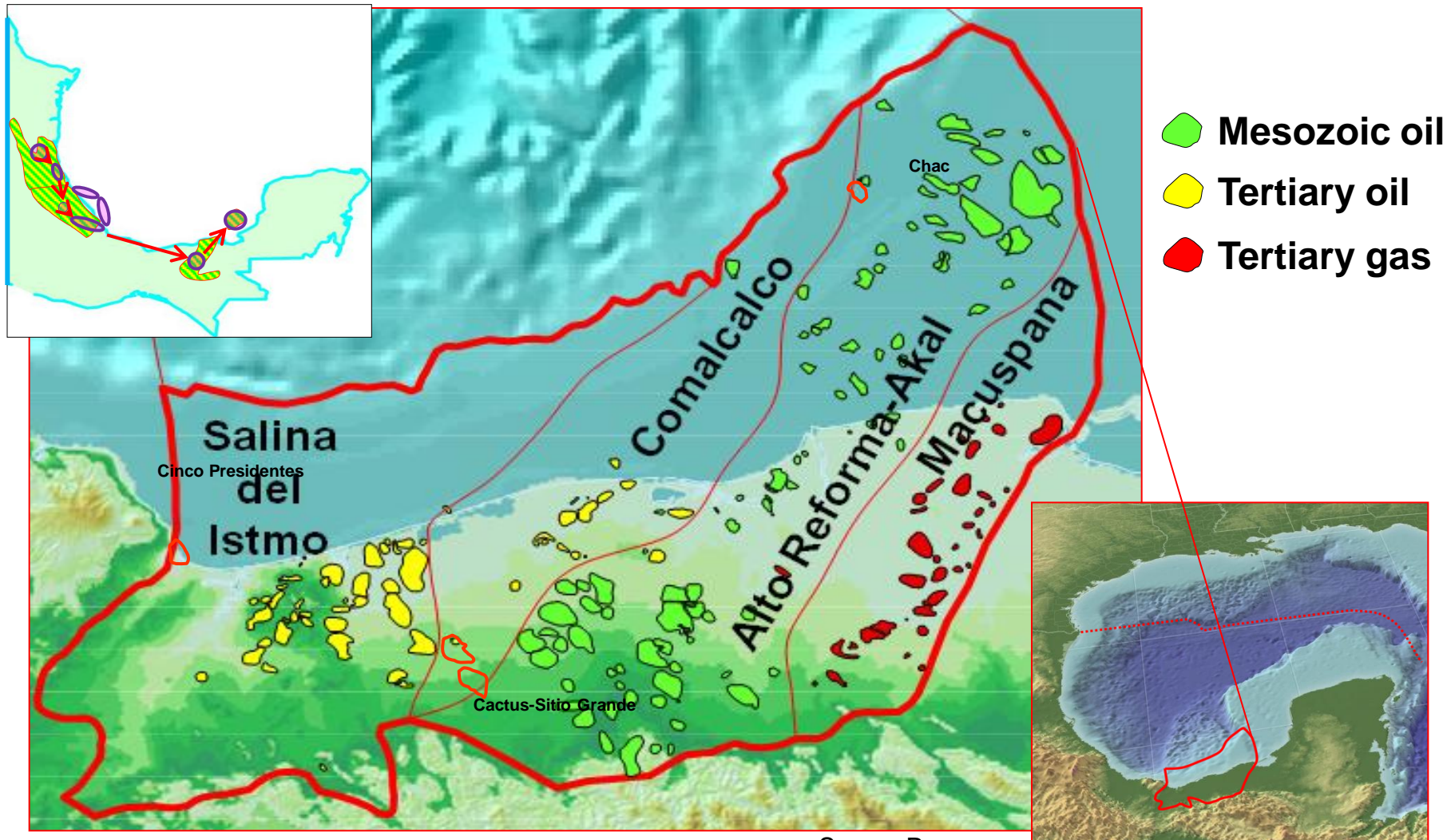
Js. Arenque  
Js. Tamaulipas  
Js. San Andrés  
K. Faja de Oro North  
K. Faja de Oro South



Ogarrio  
Cinco Presidentes  
Sánchez Magallanes

# The Mesozoic in the Sureste Basin, 1970's

In 1972 the Mesozoic carbonates underlying the Tertiary siliciclastics were reached discovering the giant accumulations of the Chiapas -Tabasco province and in 1976 the mega-offshore Campeche province was proven successfully.

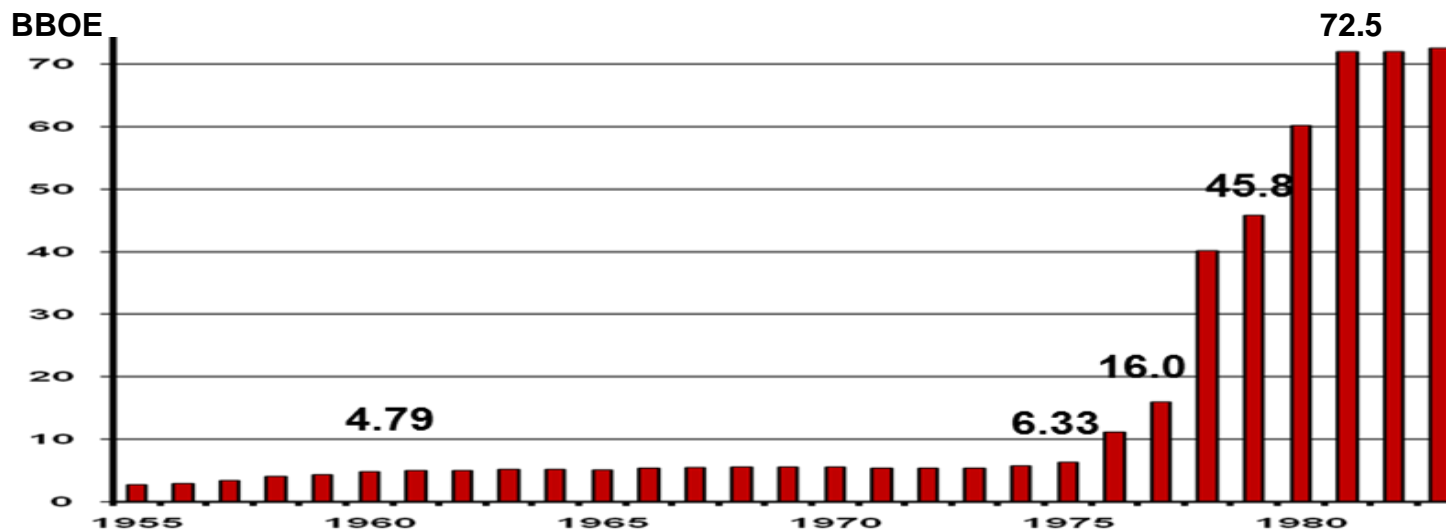
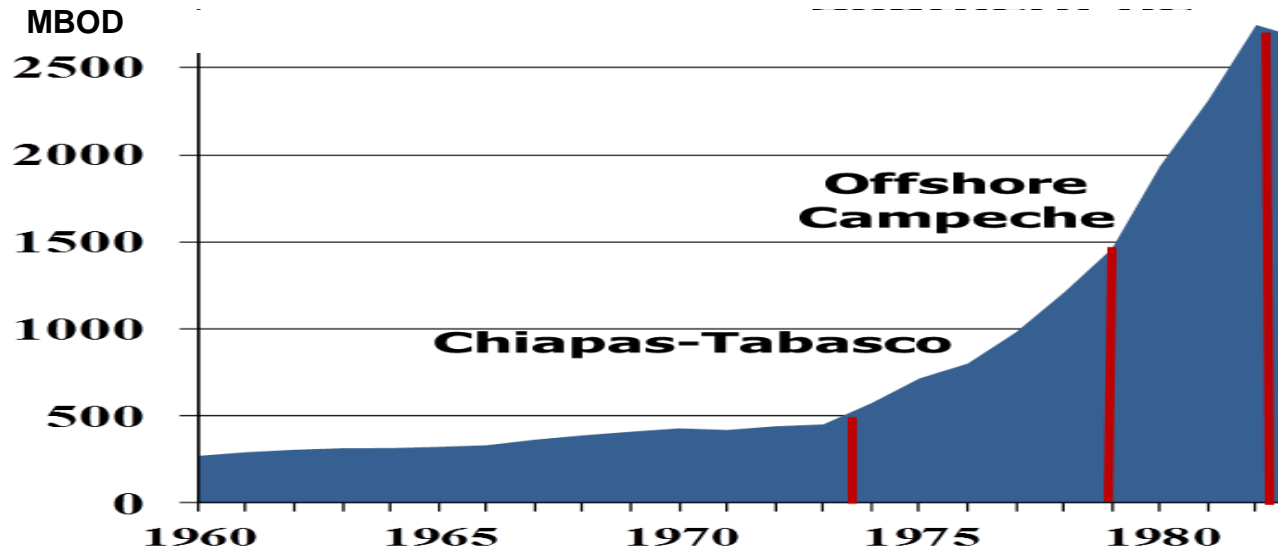


Source Pemex



# What the discoveries in the Mesozoic meant

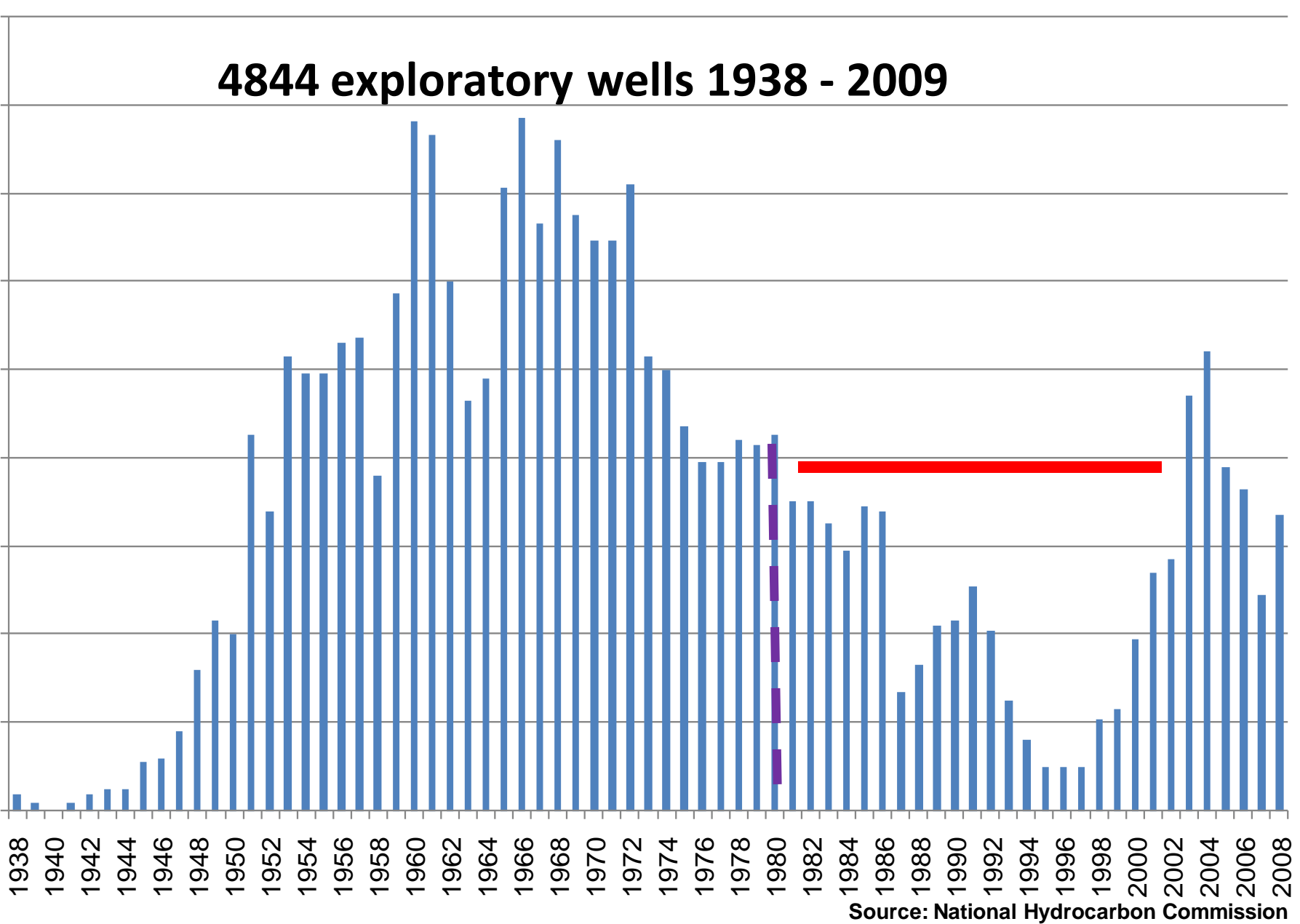
Reserves increased more than 65 BBO and production more than 2 MMBOD in less than 10 years.



Source: National Hydrocarbon Commission

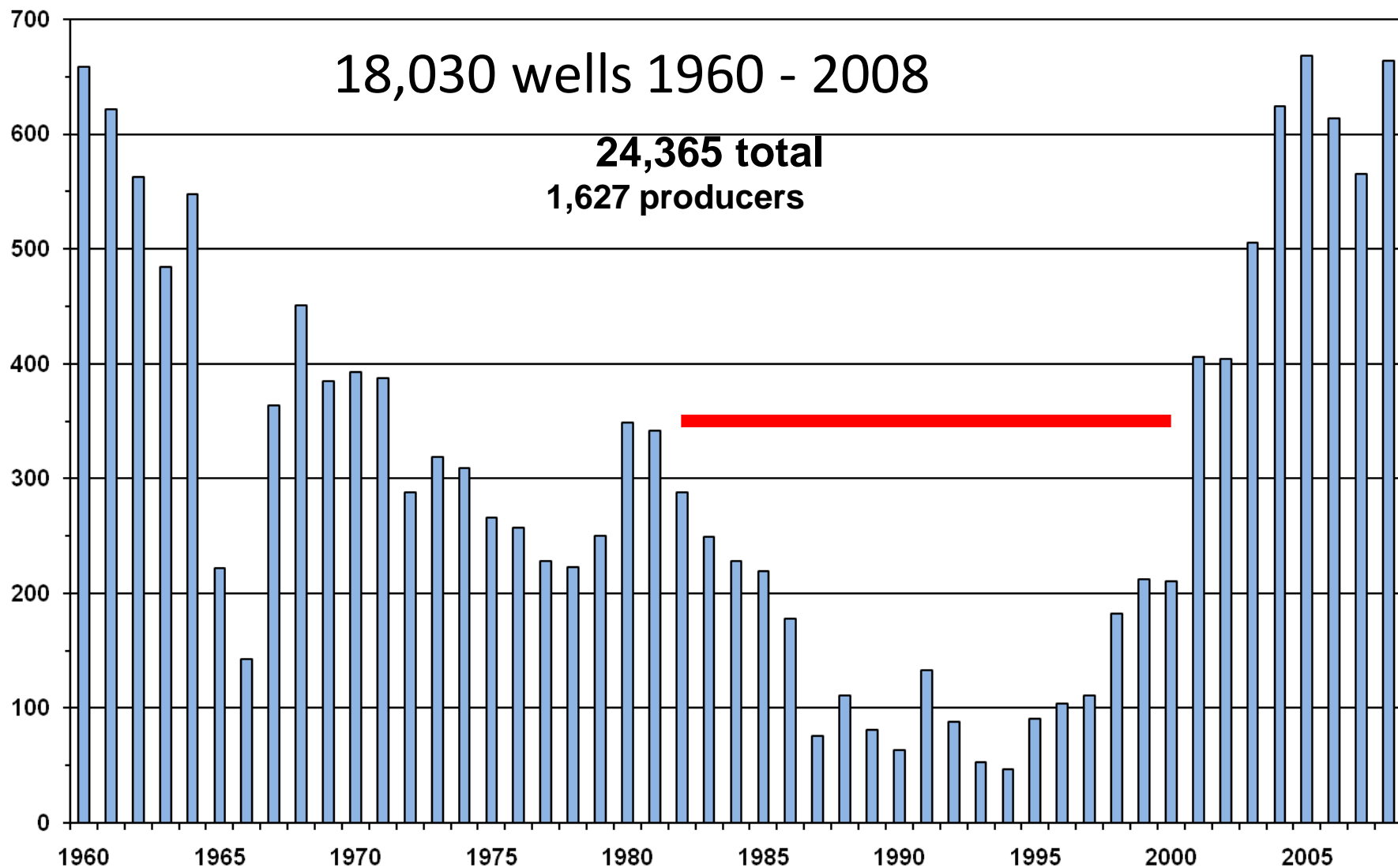
# The exploratory drilling reflects the investment

**4844 exploratory wells 1938 - 2009**

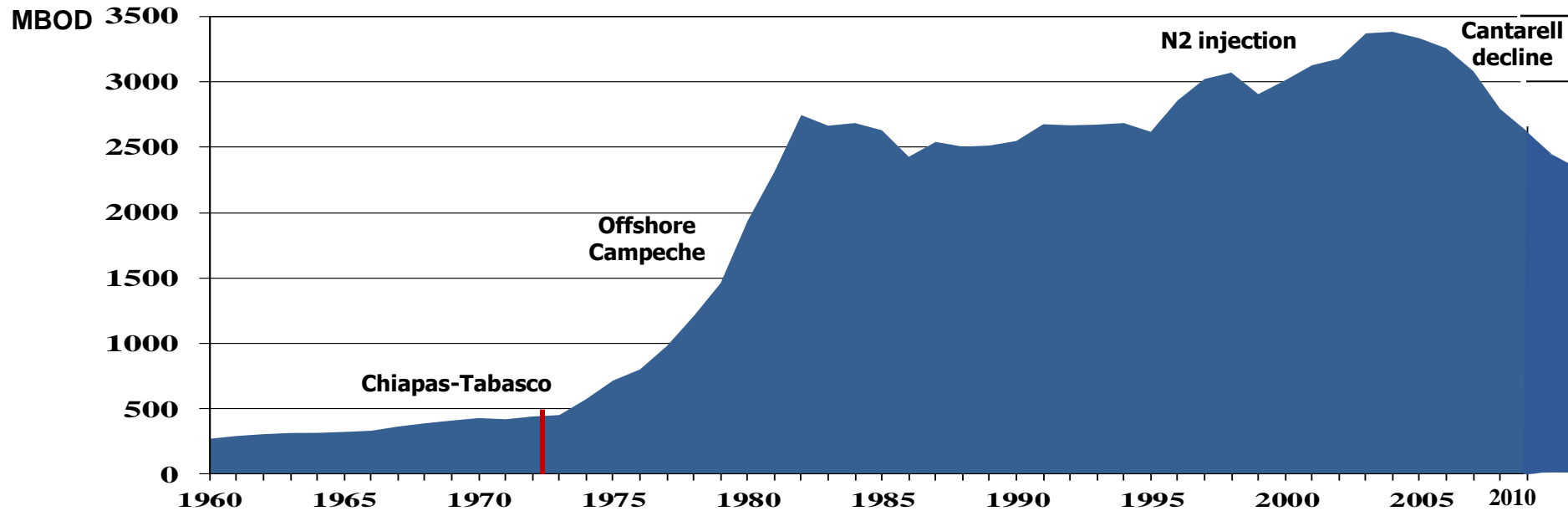


# Development wells drilled 1960 - 2010

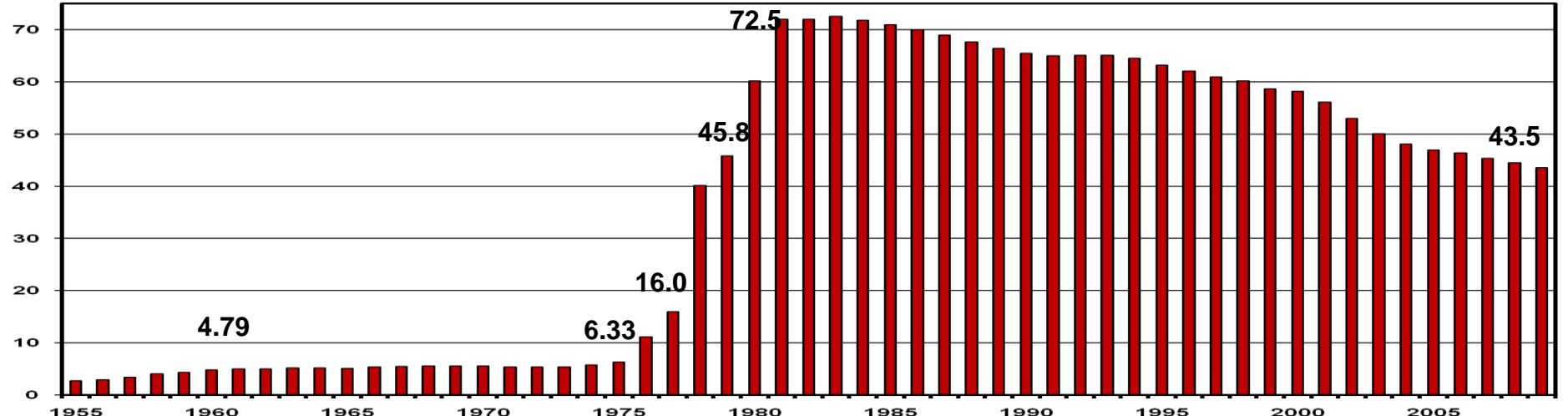
There was also a drop in the activity in part due to the high productivity of the Mesozoic wells



# The History After the Big Discoveries



BBOE



Source: National Hydrocarbon Commission

# **What is next**

**The future is dependent on the approval of a proposed Energy Reform Bill by the Mexican Congress.**

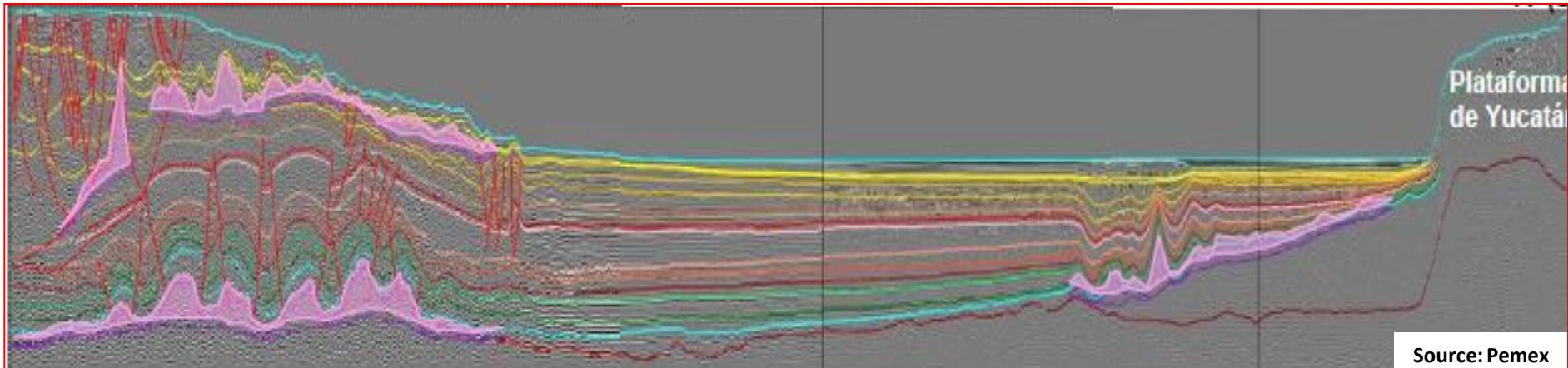
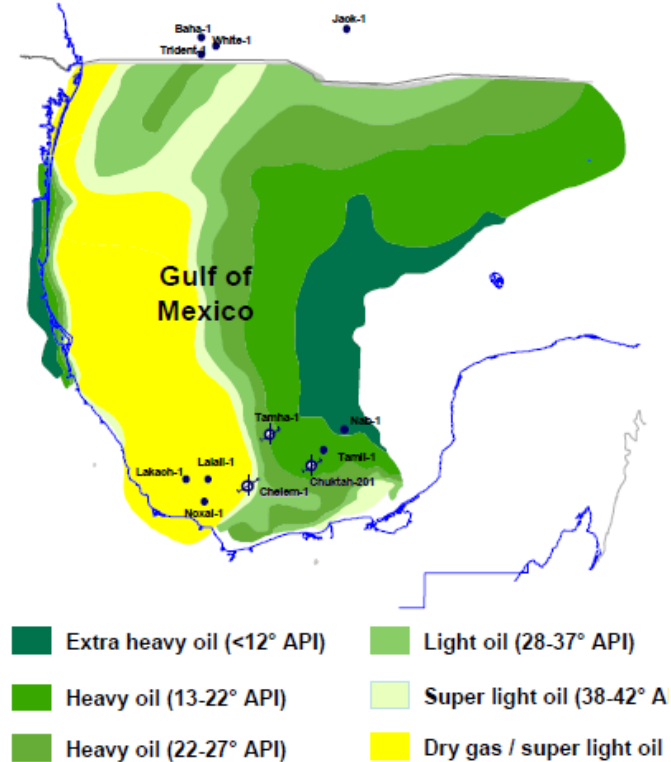
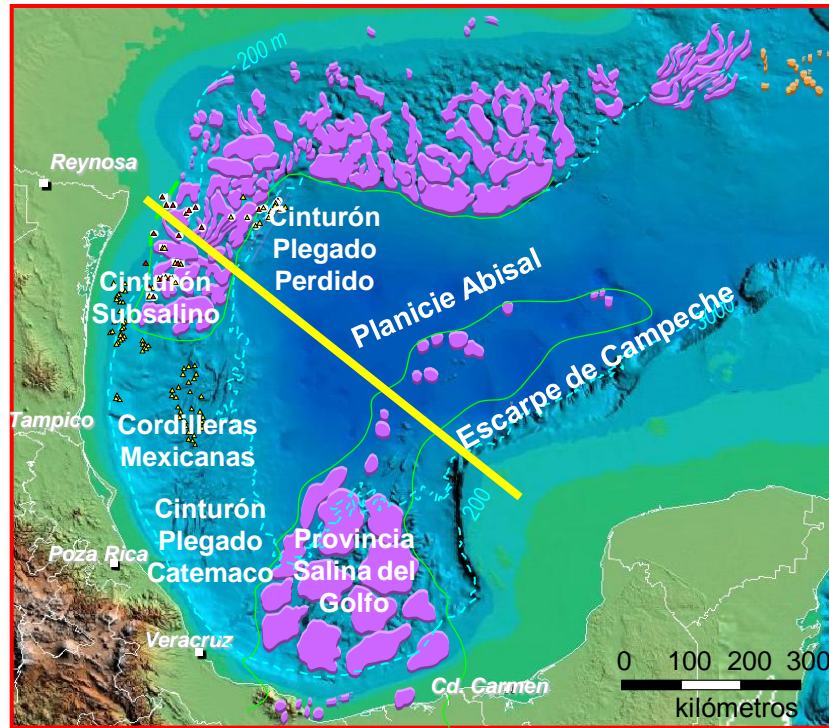
**México's strategy is based on:**

- **Deep water exploration (and development)**
- **Chicontepec development**
- **Unconventionals (Shale gas and (tight) oil)**
- **Optimization of mature fields**
- **Exploration of traditional areas**



# Deep Waters

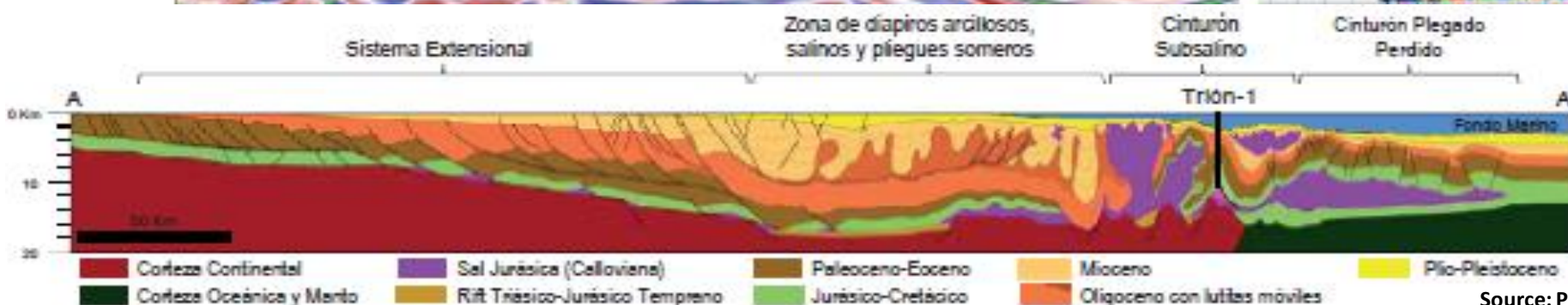
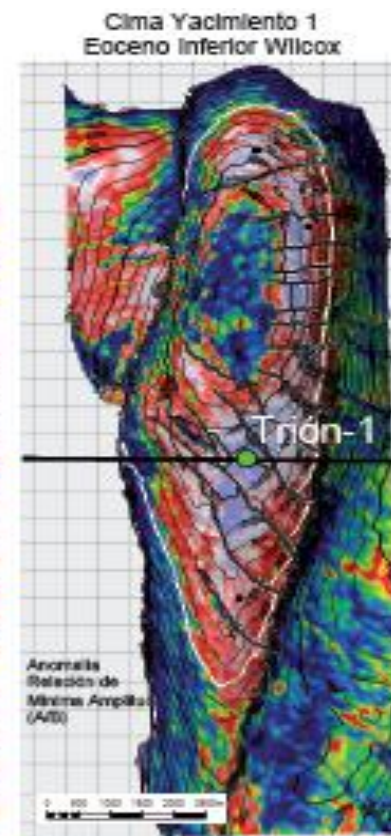
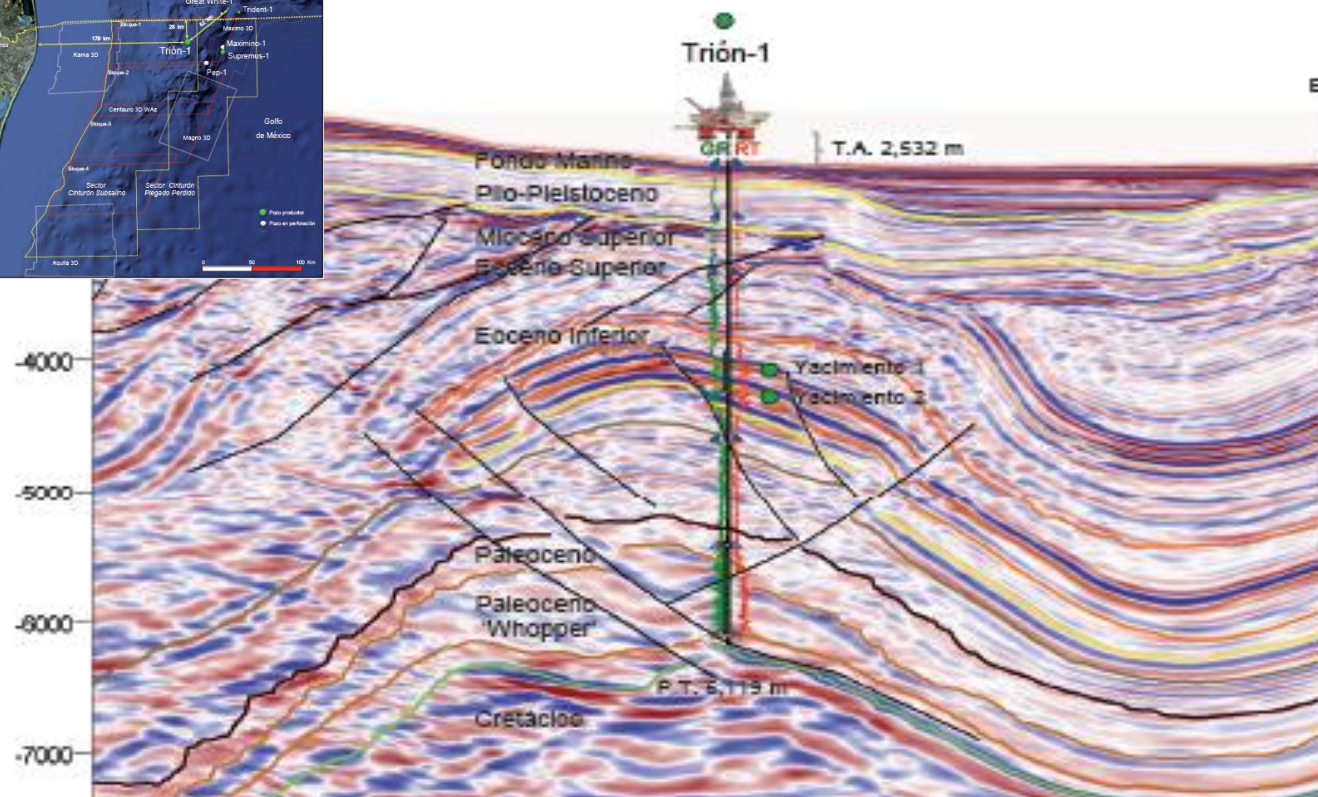
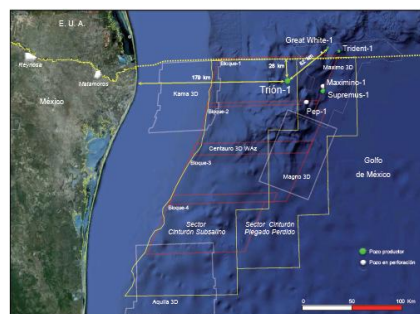
Half a million km<sup>2</sup>, Pemex calculates a potential of 30 BBOE





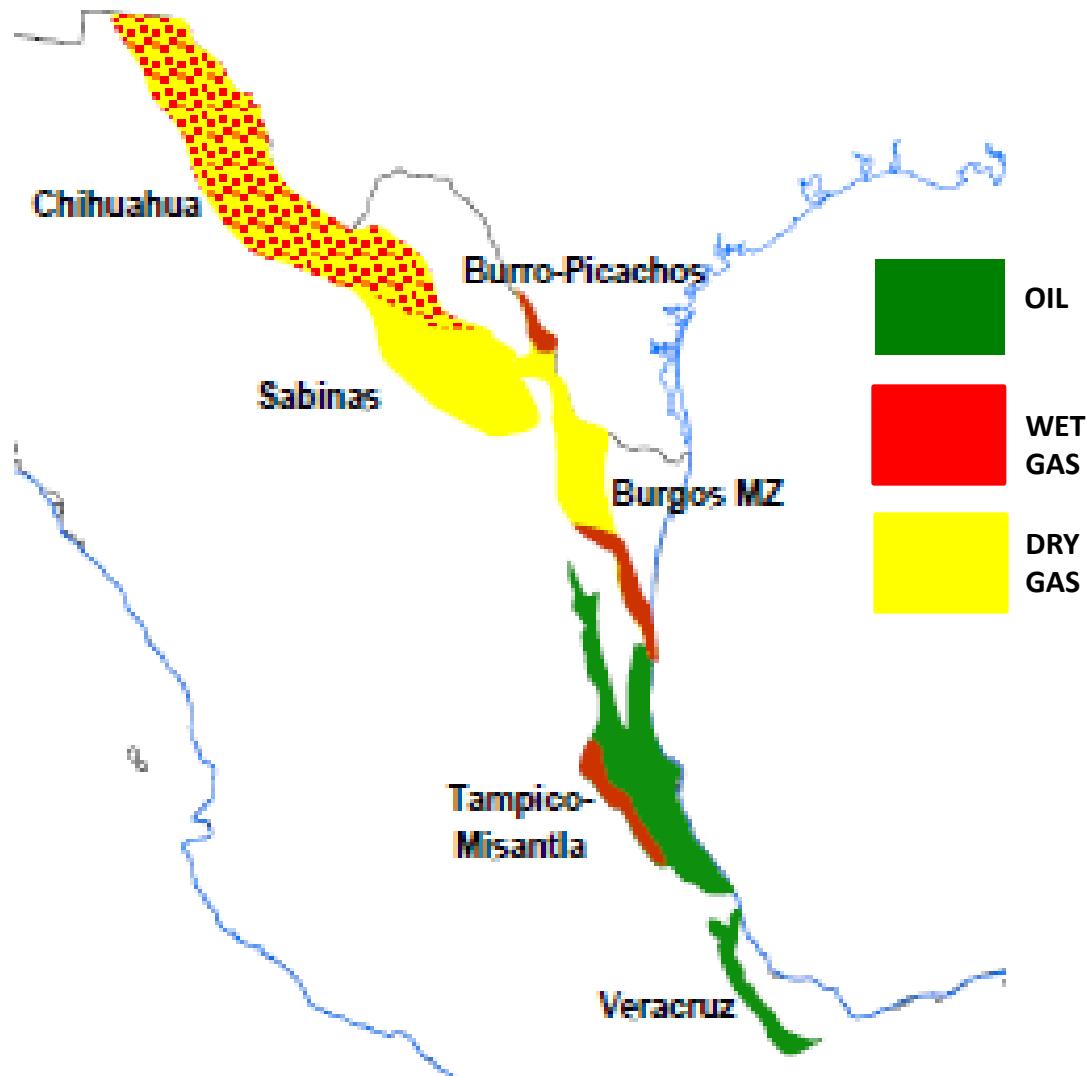
# The Perdido Fold Belt

Trion – 1, best discovery in Mexican side of the the deep GoM



# Unconventionals, Shale gas and oil

The EIA considers the potential for shale gas in México to be 545 TCF and the shale oil to be in the order of 13 BBO



## Main plays:

- The Eagle Ford, continues extensively in México with same characteristics it has in South Texas
- The Paleozoic of Northern México
- The Upper Jurassic of the Gulf Coast

# Chicontepec Paleocanyon

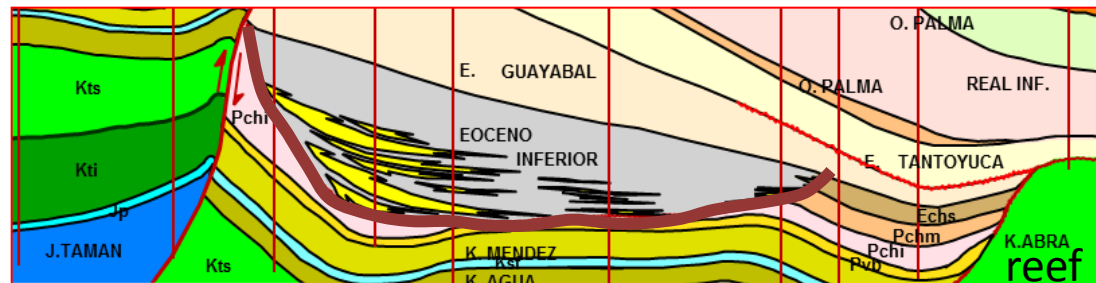
It holds 38% of all the reserves of México. Its development requires unconventional technologies as it is mostly tight oil

OOIP: 81,492 MMB  
OGIP: 39,756 MMMCF

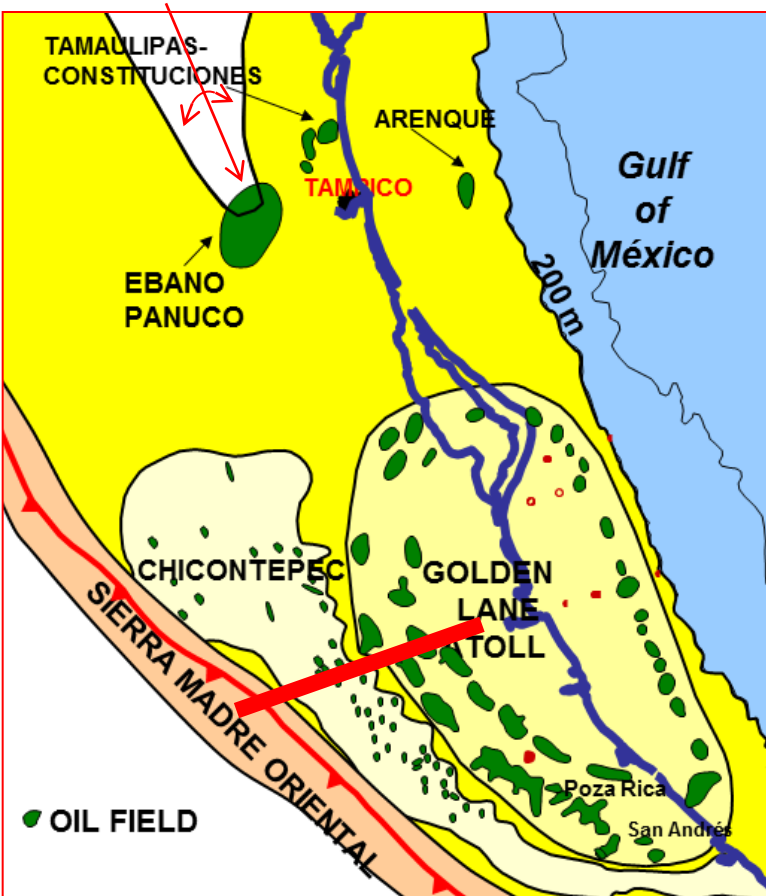
3P Reserves: 10,715 MMB (13%)  
27,636 MMMCF (70%)

Cum production: 230 MMBO (0.2%)  
424 BCF (1.0%)

Thrust belt



Source Pemex

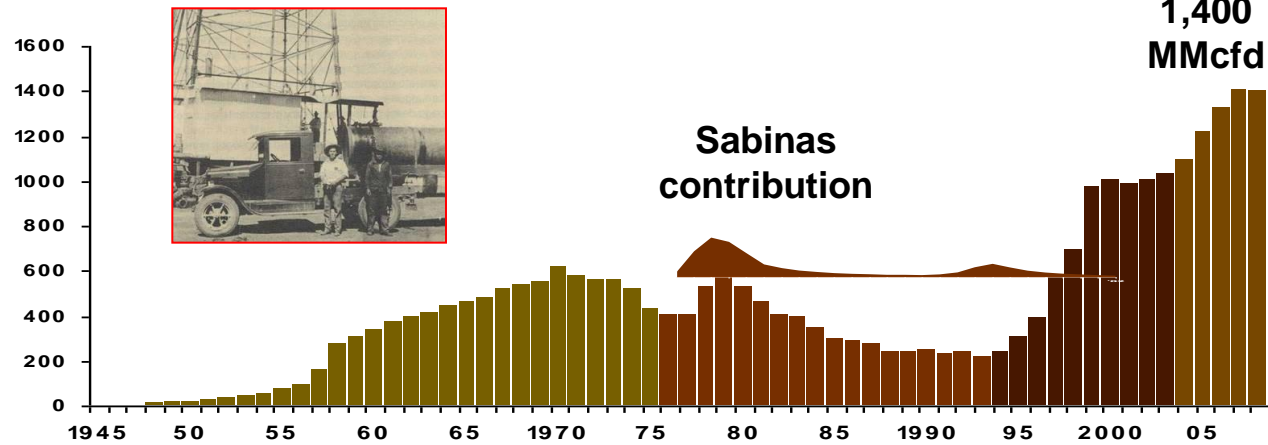




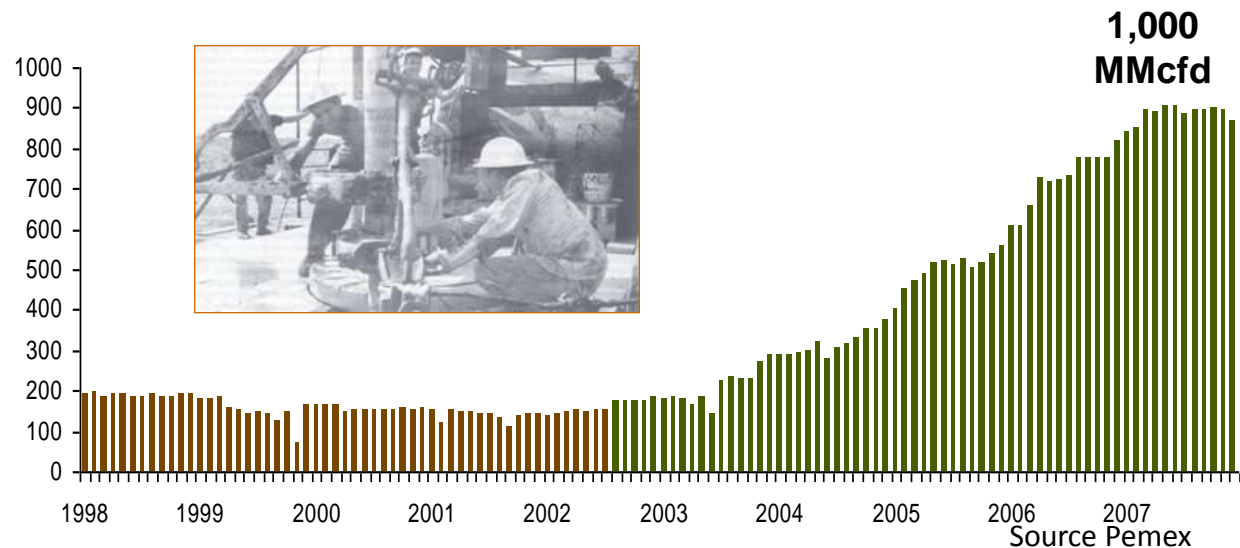
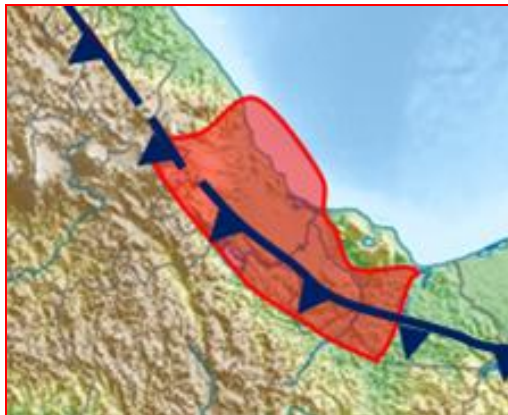
# The History of Dry Gas

The Dry Gas Basins that have been discovered in México are:

Burgos (1945) and Sabinas (1976) basins



Veracruz Basin, 1953

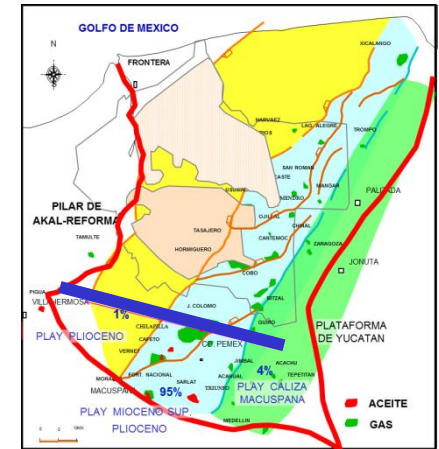
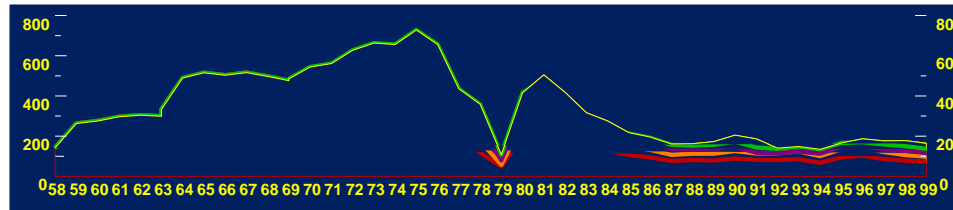
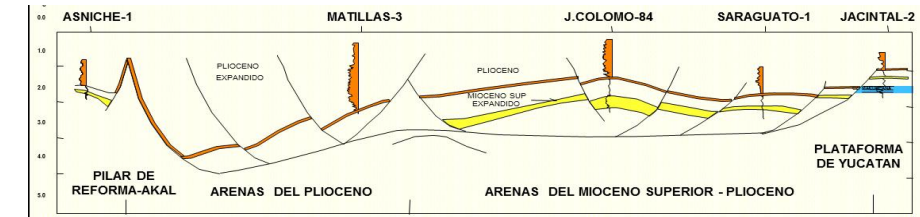




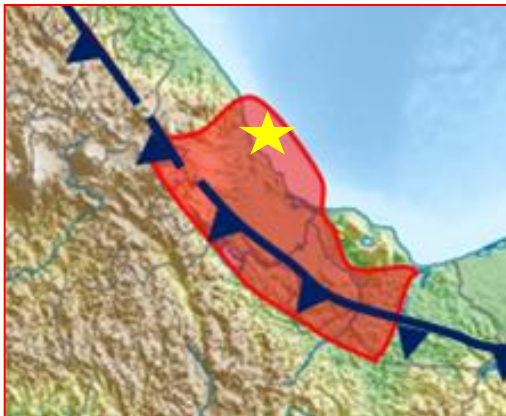
# The History of Dry Gas

The two other Dry Gas Basins are:

Macuspana, Sureste Basin, 1905

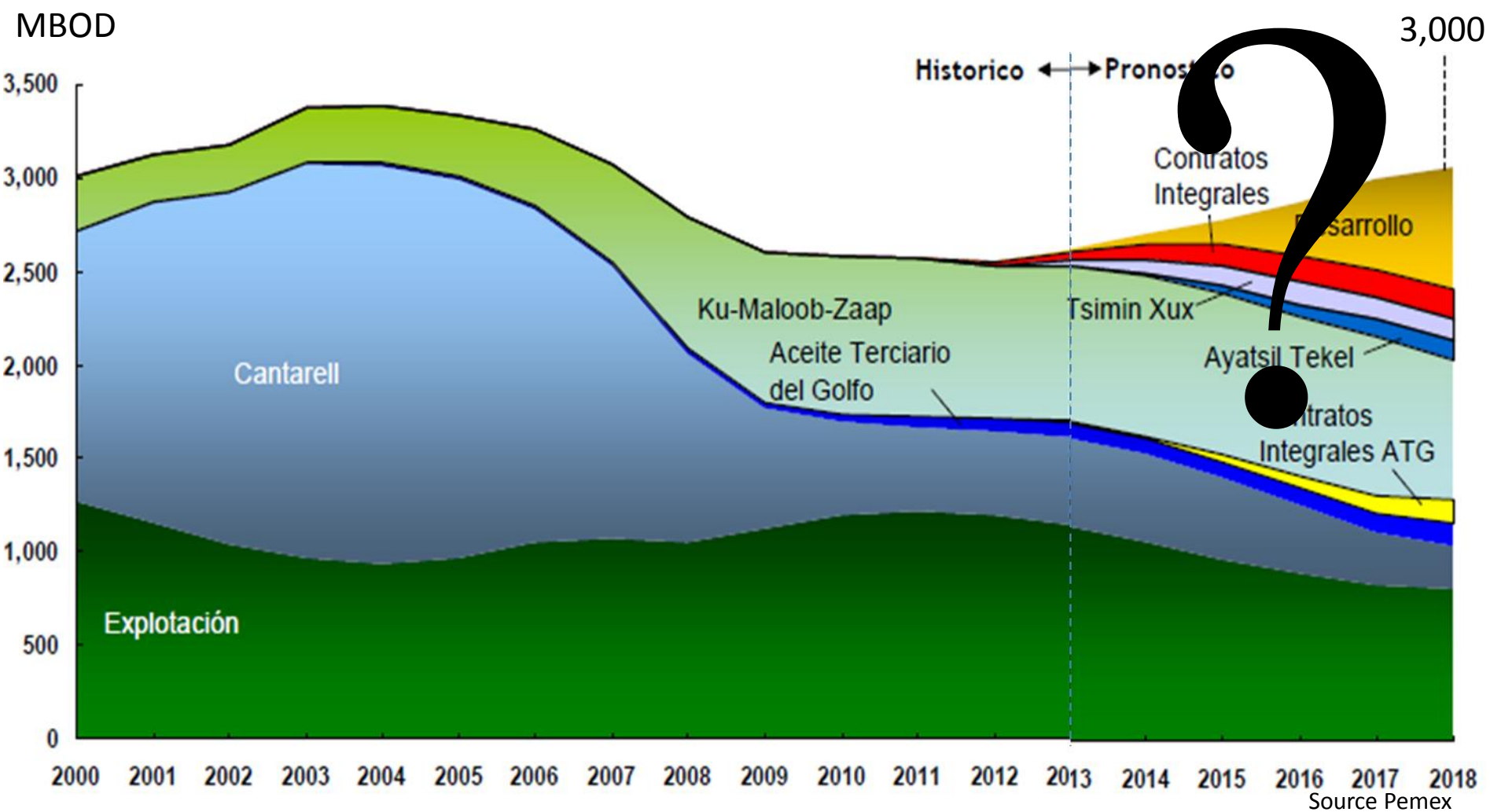


Offshore Veracruz Basin, Lankahuasa field, 2002



# The Future

**Pemex expects to bring production to 3 MMBOD, but the output will depend on the legal reform presented to Congress.**



## Closing Remarks

- Mexico has a very rich history regarding the search and extraction of its oil and gas.
- The volumes produced compared to those found are not what they should be.
- This is in part the result of what has been called the “Bitten Apple” syndrome.
- But also because insufficient participation of third parties which has limited the country’s potential.
- There is a huge number of opportunities for the E&P for oil and gas.
- For these to be made real, a legal reform was presented to the Mexican Congress.
- México has enough oil and gas to write another 100 years of history.



**Thank you!**