

**NATURAL GAS CROSS-BORDER
INFRASTRUCTURES:
NEW RISKS AND REGULATORY REQUIREMENTS
IN THE MEXICO-U.S. ENERGY INTEGRATION**

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1 - Rising energy flows in North America

2 - Growing infrastructure for Mexican natural gas imports

- Interconnexions & internal pipeline network

3 - Risks and regulations of cross-border gas pipelines

- Regulation and regulators in Mexico

1 - RISING ENERGY FLOWS IN NORTH AMERICA

- Higher exchanges Canada - US than between Mexico and US.
- However, the **US-Mexico energy relationship** plays an important role in North American energy integration.
- **65% of total Mexican consumption of natural is imported mainly from US.** “Shale revolution”; low prices; risks of supply security.
- Mexico natural gas imports do not require SENER (Secretary of Energy) permissions, do not pay taxes and anyone can import.
- In US, natural gas exports must receive permission from the DOE as they are considered of national interest.
- Permits are granted almost automatically when the exports go to a country with which the United States has a free trade agreement, such as NAFTA (UMSCA not yet approved).

Natural gas represents in Mexico:

- 1/2 of energy consumption;
- 2/3 of electricity generation;
- more than 60% of electric capacity additions are projected to come from natural gas-fired power plants

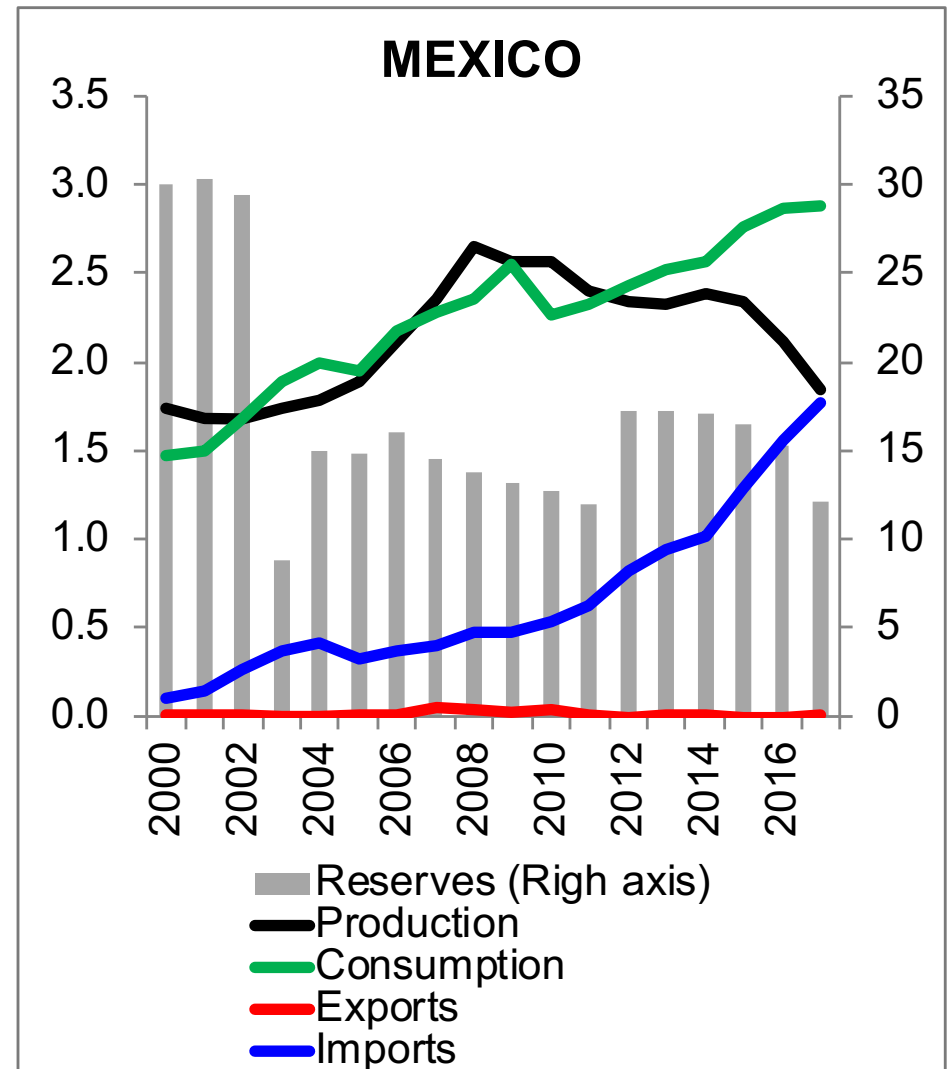
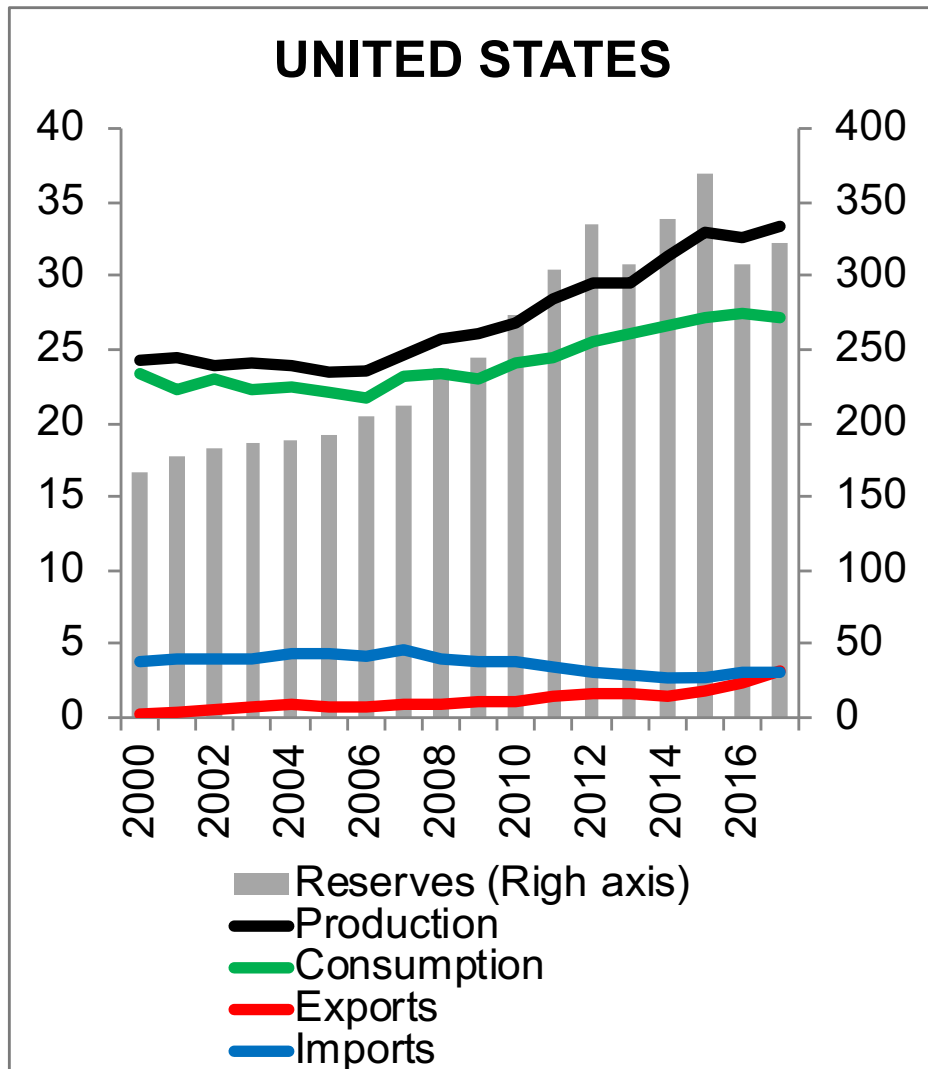
Is gas a key option for cleaner energy mix?

Conditions:

- to have more affordable prices than other substitutable sources;
- it's value must be recognized by electricity market designs that remunerate its flexibility;
 - Infrastructure (pipeline transportation, interconnexions, storage capacity) & regulation.

CONTRASTING ENERGY DYNAMICS BETWEEN THE U.S. AND MEXICO

2000-2017 (trillions of cubic feet / year)



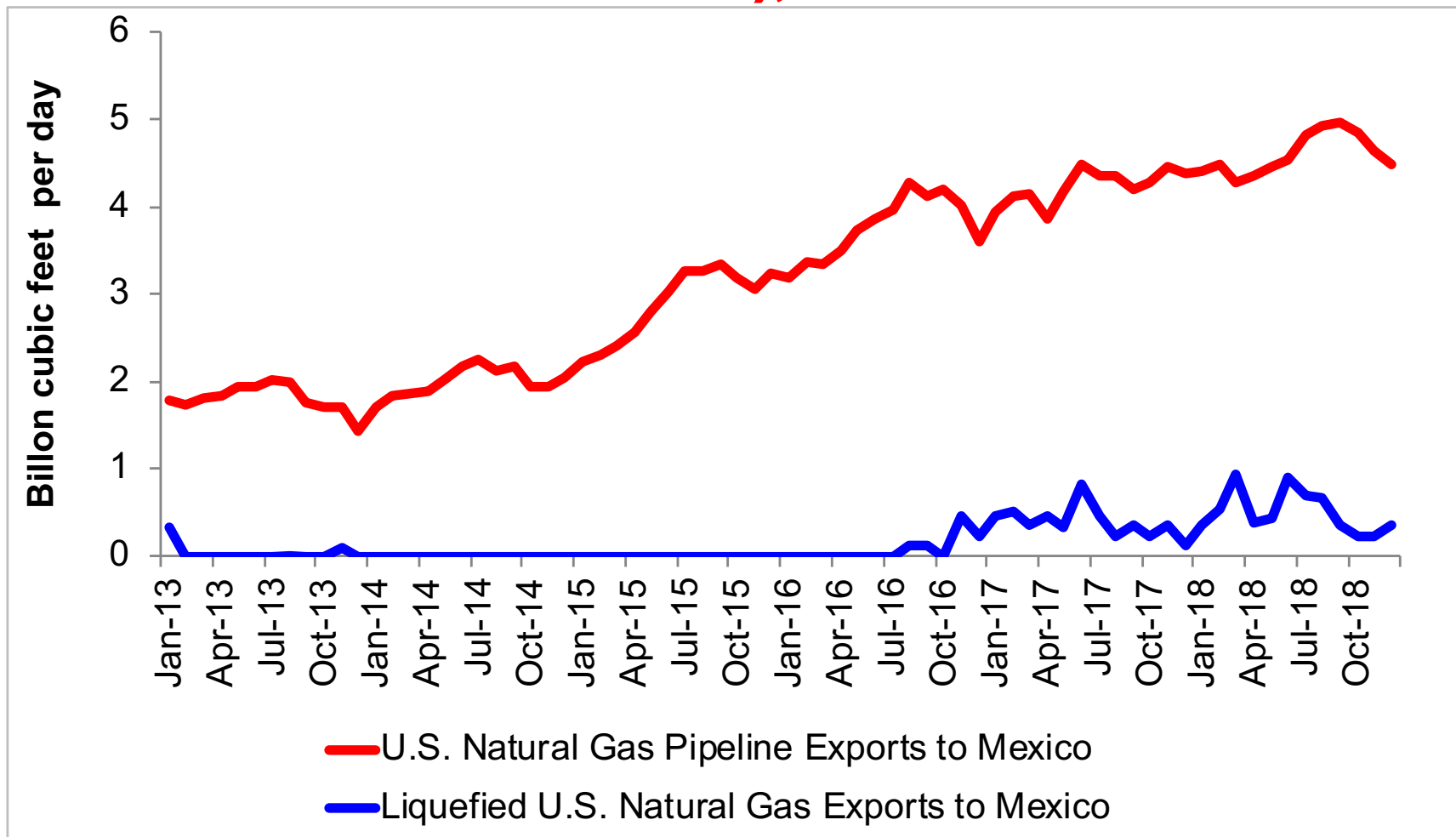
Based on data of the U.S. Energy Information Administration (EIA).

2 - Growing infrastructure for Mexican natural gas imports

- **Cross-border pipelines followed by a very important expansion of the Mexican internal network..**
- 50 operating cross-border natural gas pipelines in North America (2018): 29 U.S.-Can; 21 U.S.-Mex (H.R. 3301)
- **U.S. gas exports to Mexico via pipeline reached 5 bcfd** for the first time in August 2018 (EIA data).
- There is also the possibility of **importing gas as LNG... but higher prices.**
- **So, more pipeline imports mean cheaper gas than LNG imports.**

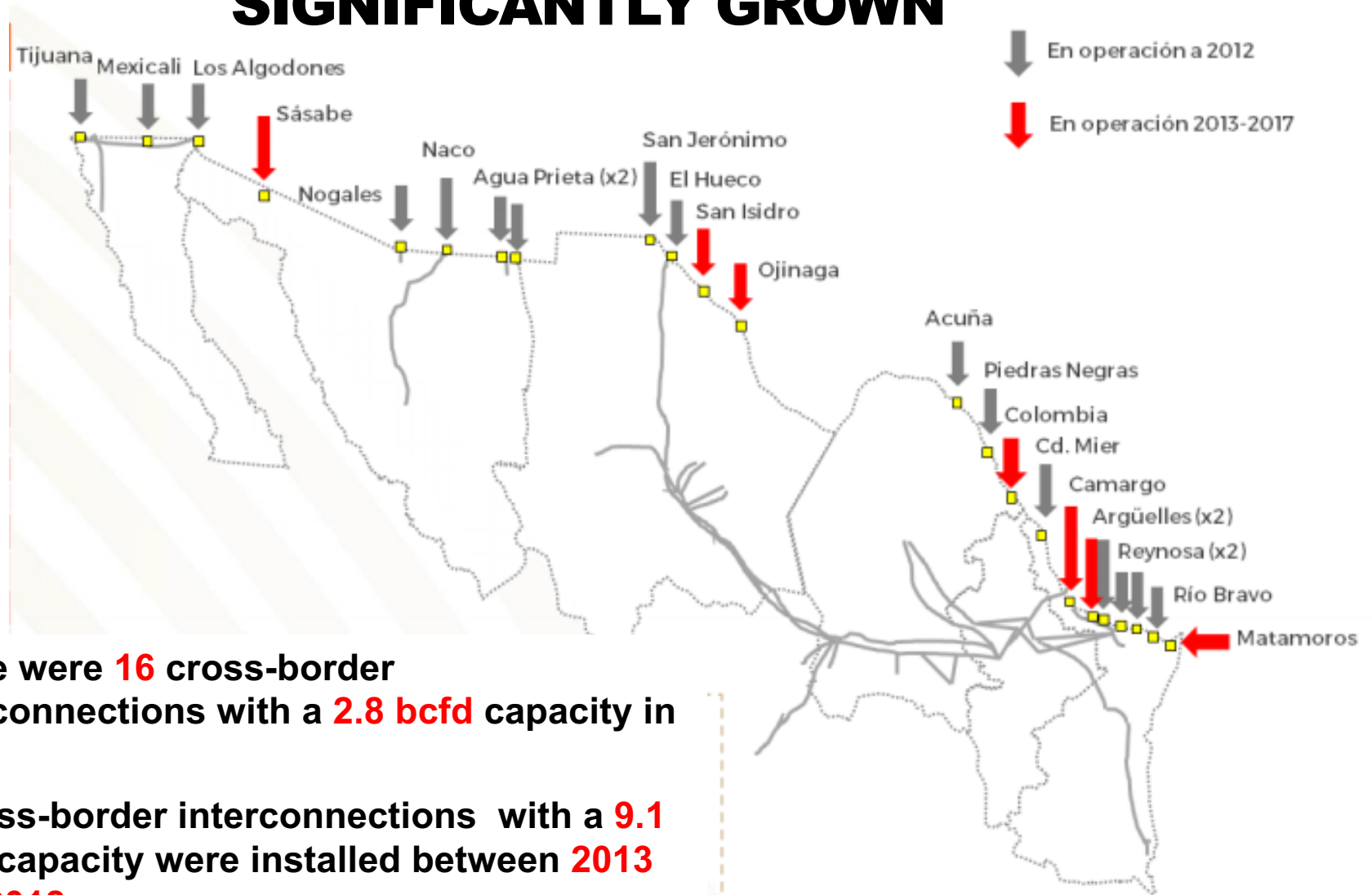
(“**Pipeline Politics**” (Ali Dastan, 2018): participation of governments and other actors; huge investments; issues of conflict and power).

NATURAL GAS PIPELINE EXPORTS AND LNG EXPORTS (FROM THE U.S. TO MEXICO), 2013-2018



Based on data of the U.S. Energy Information Administration.

THE CAPACITY OF GAS PIPELINES BETWEEN THE UNITED STATES AND MEXICO HAS SIGNIFICANTLY GROWN



There were **16** cross-border interconnections with a **2.8 bcf/d** capacity in **2012**.

8 cross-border interconnections with a **9.1 bcf/d** capacity were installed between **2013** and **2018**.

Capacity 2019: more than 11 bcf/d.

Source: SENER, 2019

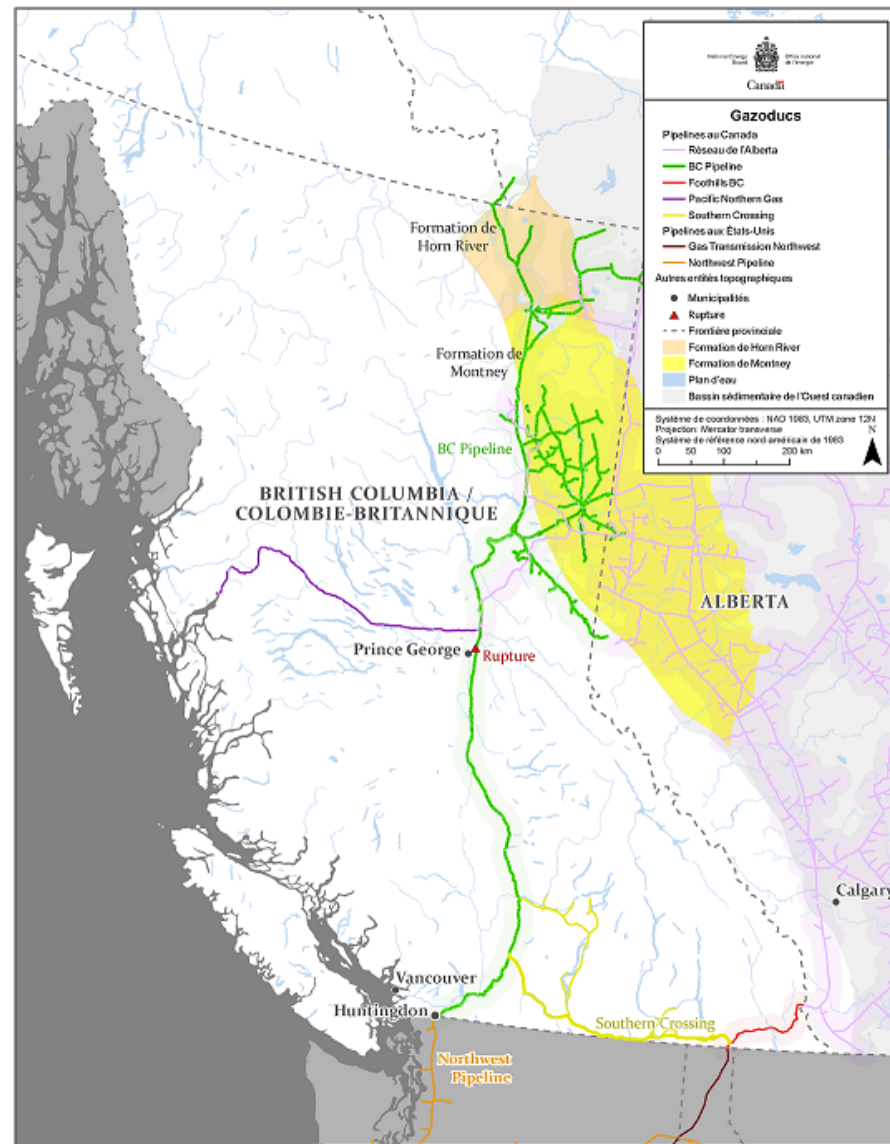
IMPLICATIONS OF THE GROWING INFRASTRUCTURE

- **Questions:**
 - Abundance of gas north of the border?
 - Continuity in low gas prices?
 - Mexico as a priority option for US exports?
- **Risks of lock-in of the gigantic infrastructure.**
- **Risks of the billionaire stranded assets that have an effect on the development of renewable energies.**
- **Over-construction of gas pipelines?**
 - Investments & costs
 - Security
 - Environment

3 - RISKS AND REGULATIONS OF CROSS-BORDER GAS PIPELINES

- **Concerns about environmental and safety regulations.**
 - What happens if two or more legal and regulatory regimes are involved?
 - Each pipeline is different; each accident is different: varying causes; varying consequences.
 - Are the causes foreseeable? → Preventive regulations
 - If an accident happens, are weak or strong regulations → fulfillment of compensation for damages.
 - Regulations to minimize risks increase costs for companies. An example (Nigeria):
 - **“many oil pipeline spills in Nigeria were the result of low-quality safety standards and poor maintenance by MNCs [Multi-National Companies]”** (MEHDI P. D. & Michael Faure, 2014).
 - **“there is a considerable tendency for polluters to externalize their costs to local communities** when the costs of compensating the victims are lower than the costs of complying with safety regulations” (Ibidem)

An accident in any section of a pipeline can disturb the entire chain. A supply break can be very expensive for producers and consumers. Canada: October 9, 2018, ruptures of a section of the Enbridge T-South Pipeline



Risks and regulations of cross-border gas pipelines (Contin.)

- **Each cross-border pipeline has its specific legal framework.**
- **Agreements may result from contracts between companies, including state ones, or commanded via government with investors or operators.**
- **Two models:**
 - **Interconnector model.** Each section of the cross-border gas pipeline falls under the jurisdiction of the State whose territory it crosses and is regulated based on the national laws of that State. The ownership of the gas pipeline and the gas transported is transferred to another State at the border.
 - **Unified model.** A legal framework for the entire extension of the pipeline and uniform regulations are implemented by a consortium of multinational firms, which acts as an operator along the entire length of the pipeline. Possible conflicts with national and local regulations of the receiving State that will seek to apply its own legislation to protect its interests depending its bargaining power.
- **Complementary options:**
 - “Framework agreements of general applicability” that take into account the specificity of the pipelines.
 - International or regional agreements.

Risks and regulations of cross-border gas pipelines (Contin.)

- **Traditionally, no clear framework for regulating the U.S-Mexico cross-border energy relations:**
 - “...there is no such a thing as an energy agenda for the border region: no true market for electricity across the border, no bi-national plan for electricity generation or transmission, and no program to develop new technologies or energy reserves” (COMEXI and Pacific Council on International Policy, 2009).
- **In spite of the Mexican energy reform and NAFTA, the security of the U.S-Mexico cross-border gas pipelines have not been addressed enough.**
 - “The expansion of cross-border energy transportation infrastructure —pipelines for oil and natural gas and transmission lines for electricity— is necessary to enable increased energy trade. A number of new projects are currently under construction or proposed to further expand cross-border capacity, but they face considerable Federal regulatory uncertainty” (WALDEN, 2017).
- **Local levels are often ignored (not only in U.S-Mex, even in U.S.-Can):**
 - “FERC has disregarded the perspective of state and local governments, ratepayers, and other stakeholders, and approved new gas pipelines without a full evaluation of regional needs and advances in energy policy” (McKenna, 2018).

REGULATORS OF GAS PIPELINES IN MEXICO



CRE regulates and supervises **“open access”** permissions.



ASEA regulates and supervises “open access” permissions from an **environmental and security perspective**.



CENAGAS organizes **“open seasons”** to auction capacity rights of the pipeline network in the country and cross-border interconnections.



SEMARNAT issues **environmental impact authorization** to any actor interested on developing oil and gas activities.

ASEA: Agency for Safety, Energy and Environment

DIFFICULT REGULATION IN THE NEW CONTEXT

ASEA is in charge of the entire oil and gas chain, from exploration and production activities to service stations.



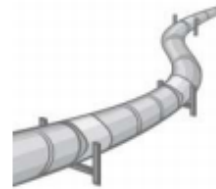
+9,300 Wells



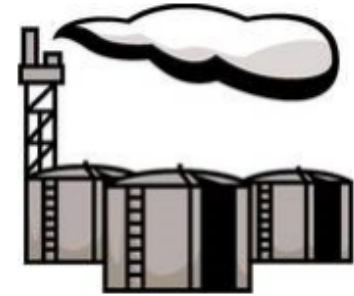
+250 Offshore
Platforms



+12,000
Gas
Stations



65,000 Km of
Pipelines



6 Refineries



70 ASEA
Inspectors



9 Gas Processing
Facilities



+3,300 LP Gas
Distribution and
Carburation
Centers

In contrast, US - BSEE are **focused almost exclusively on wells in deep water and has twice as many staff as the ASEA.** See also NEB (Canada pipelines regulator)

ASEA'S ROLE

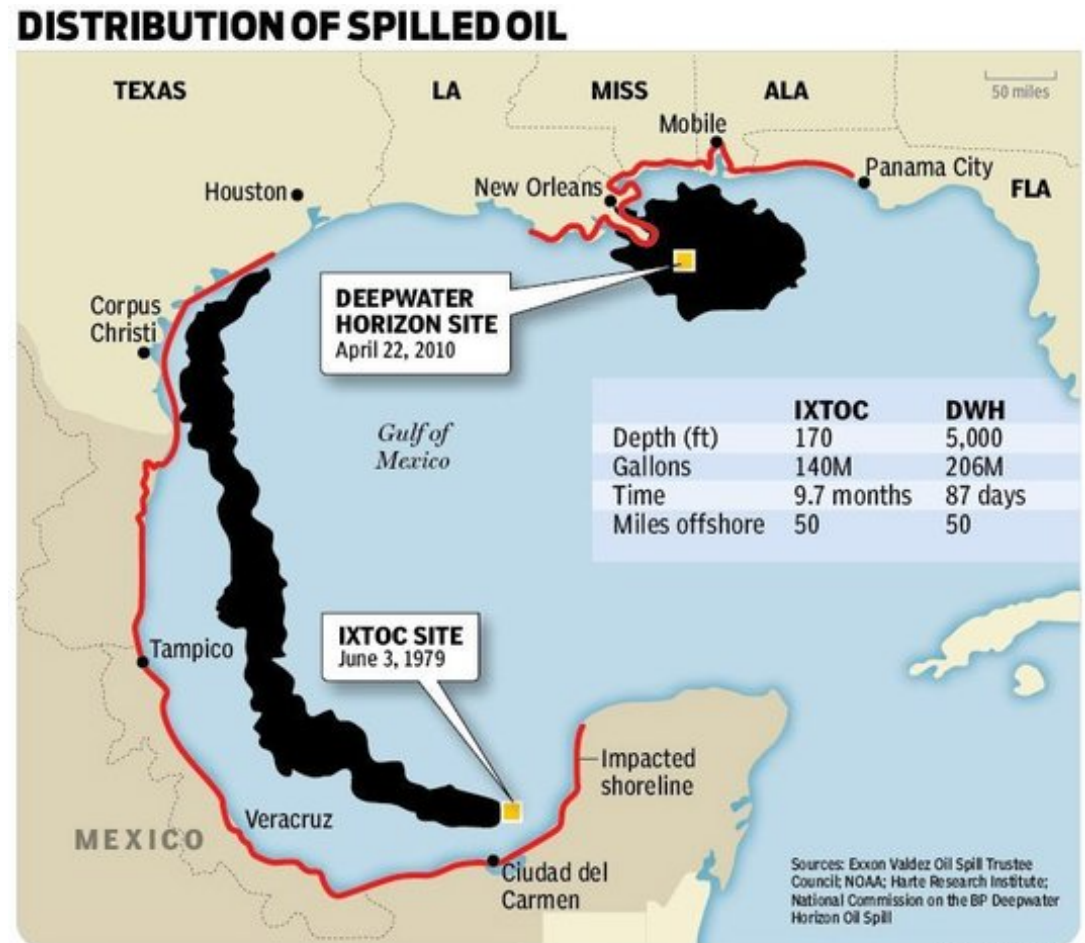
- Strategic initiatives of ASEA have been focused on establishing regulation to implement the **Mexican energy reform** (2013-2014)
- ASEA has demanded Pemex and other energy firms to make '**root cause analysis**' (RCA) of the accidents, as well as to take actions to avoid new.
- A **risk-based strategy** to identify the key points and attend them. It makes **inspection programs** of the offshore installations in the Gulf of Mexico, identifying measures to eradicate the most recurrent risks.
- ASEA has defined objectives in its guidelines based on **international information and experiences**.
- **Insurance** influences the way in which the regulated actors manage risks and their impacts, but it is not a replacement of preventive efforts. Insurers or reinsurers do not only mitigate the risk, but they provide resources (when insurance compensation applies) in case of environmental catastrophe.
- **Social aspects** need to be considered → **social impact assessment**

COORDINATION OF ASEA WITH OTHER AGENCIES

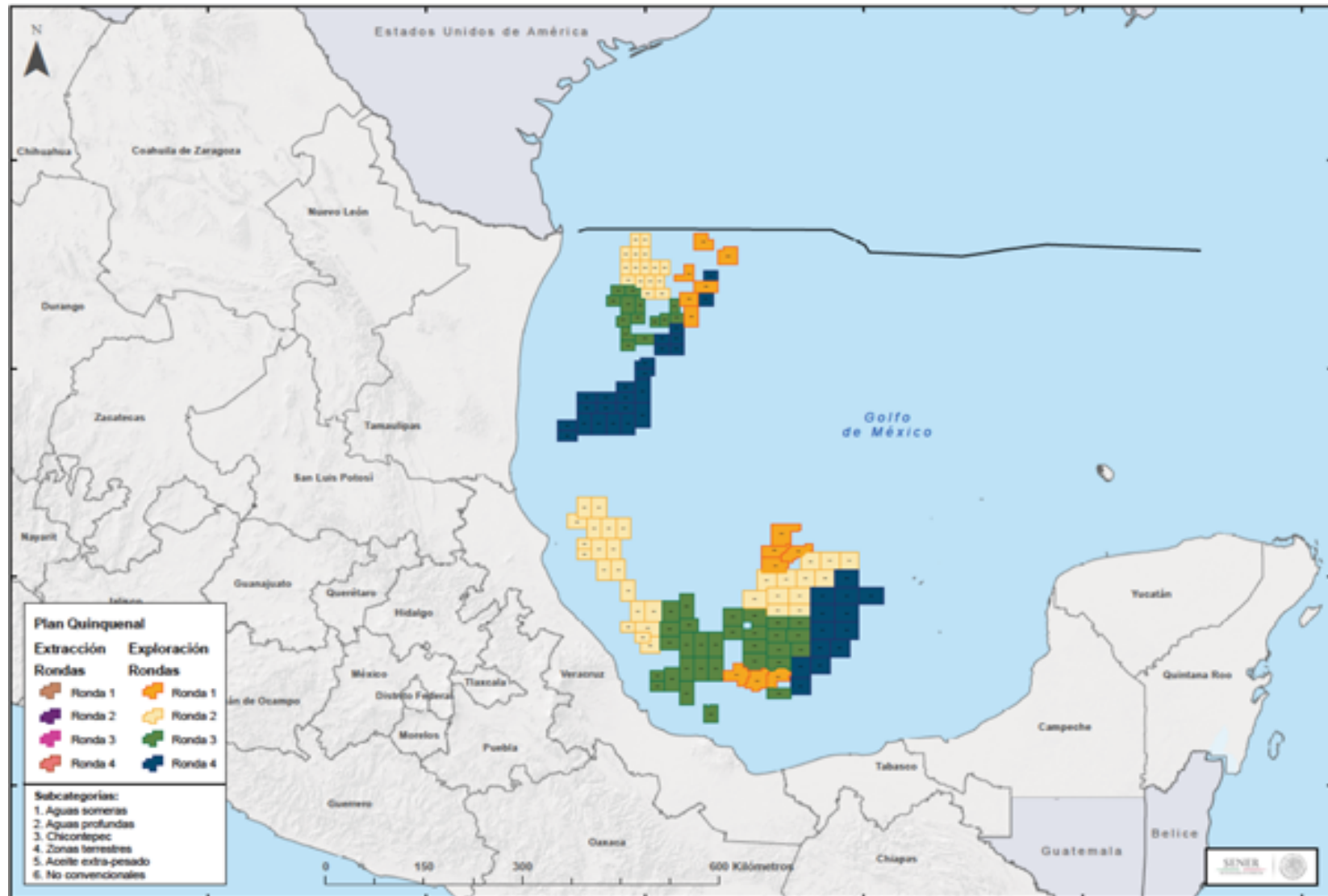
- In case of accidents, protocols to deal with them are coordinated between the ASEA and different ministries and dependencies: Navy, Government, Health, among others.
- Coordination at the international level implies more and more complicated challenges.
- “Harmonization” → from simply sharing information to the coordination of existing bilateral or trilateral institutions and the alignment of processes and regulations.
- There is much to be done among North American partners. Canada and the United States have advanced more, even so there are shortcomings and inadequacies.

PREVIOUS ACCIDENTS: OIL SPILLS IN THE GULF OF MEXICO

- Prior to the Mexican energy reform, Pemex operated as a self-regulated monopoly → environmental and safety problems; limited capacity to respond to catastrophes.
- There is not enough knowledge about how the accidents happened, neither systematized nor safeguarded information.
- Until now and despite having spent several decades, we do not exactly know what happened in Ixtoc I in 1979. And in Kab 101 in 2007



Mexico opened its deep waters to the exploration and future production of hydrocarbons. new risks and regulatory requirements



FINAL CONSIDERATIONS

- A modern **infrastructure is fundamental for the integration of energy markets.**
- Energy activities and their infrastructure need **regulation to minimize risk and face impacts.**
- It is necessary to make a more **systematic articulation among economic, environmental and safety regulations.**
- Necessary to **strengthen ASEA**, whose role does not stop at borders.
 - As the energy relationship with US increases, new situations can affect human lives, economic activities and environment.
 - Regulatory coordination, convergence, and harmonization.
 - International experiences on risks, legislations and regulations of cross-border infrastructures to have references
- Some subjects that require **more research** are: **instruments of economic valuation to face accidents & its damage; insurances.**

Place the study of infrastructures in a broader framework: natural gas + renewable strategy?

- allow a gradual incorporation of diversified low-carbon options
- **natural gas** emits less **CO₂** per kWh than other fossil energies
- an adequate backup to intermittent renewables
- Not only “conventional or unconventional”: natural gas from renewable sources

Thank you!

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