

**Testimony of Jolanda Prozzi**  
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**Before the**  
**Senate Natural Resources Committee**  
**Subcommittee Studying Impacts of Mexico's Energy Reforms on Texas Infrastructure**  
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## **Introduction**

The recent energy reforms signed by Mexico's president, Enrique Peña Nieto, are expected to attract a substantial amount of private foreign investment for exploration and extraction of oil, condensate, and natural gas.<sup>i</sup> Exploration of Mexico's shale reserves that are located south of the Rio Grande River, mainly in the Burgos Basin (an extension of the Eagle Ford Shale Play), is thus expected to increase. The potential extraction of oil, condensate, and natural gas from the Burgos Basin is expected to have a significant impact on Texas' transportation system, because of a lack of infrastructure in Mexico.

## **Mexico's Energy Reform**

Mexico's energy reform, signed in December 2013, is intended to end the monopoly of the oil company Petróleos Mexicanos (Pemex) and encourage foreign investment in Mexico's energy sector. The energy reform's key details (secondary laws) have recently been negotiated in the Mexican congress.<sup>ii</sup> These negotiations centered around the Mexican regulations pertaining to the transition, the tax burden on Pemex, and Mexico's petroleum fund.

The reform to the Mexican constitution releases the government's control over Pemex and attracts private investment in the energy industry. The government will hand over the *"regulatory authority over the oil and gas sectors to the Energy Regulatory Commission, the Secretary of Energy, and the National Hydrocarbon Commission, and create a new national agency of industrial safety and environmental protections."*<sup>iii</sup> This action by the government will maintain Pemex as a state-owned entity, but with more *"administrative and budgetary autonomy, and allow the company to compete for bids with other firms on new projects."*<sup>iv</sup> These reforms are necessary for Mexico's energy industry to successfully develop, particularly along the Burgos Basin. Javier Treviño, of the energy commission, explains that Mexico has to develop its energy resources to keep pace with Canada and the United States.<sup>v</sup> Finally, Mexico's energy reform also *"provides for private companies to invest in the areas of refining, petrochemicals, and the storage and transportation of hydrocarbons and their derivatives"*<sup>vi</sup>.

## **Mexico's Commitment to Investing in Infrastructure**

In 2012, Mexico's President Enrique Peña Nieto announced a six-year plan to invest \$316 billion in infrastructure, including roadways, railways, telecommunications infrastructure, and marine

ports.<sup>vii</sup> The goal of the National Infrastructure Program (NIP) is to enhance the country's export competitiveness and stimulate economic growth. The NIP includes, but is not limited to, the development of 60 new roads (15 toll roads, 29 freeways, and 16 rural roads), seven ports, three passenger railroads, and seven airports.

Part of the NIP is a new invitation to the private sector to enter into partnerships with the federal government to foster economic development. Mexico enacted a new federal public-private partnership (PPP) law to attract more private investors. This new law, which was first enacted in December, 2013, includes key changes:<sup>viii</sup>

- Transparent bidding process for contracts;
- Minimum Mandatory Terms;
- Clearer rights for investors; and
- Dispute Resolution via arbitration.

The new law is expected to attract more investors and could potentially result in Mexico becoming a major infrastructure market in the coming years. With the creation of this law, it is expected that private investors will respond positively by investing more capital.

### **Transportation and Energy Exploration**

The transportation system supports three major activities in the energy supply chain: well development, resource production/extraction, and distribution.<sup>ix</sup>

#### *Well Development*

Construction traffic is generated during the five-step well development process: site preparation, rigging up, drilling, hydraulic fracturing, and rigging down. Initial site preparation requires heavy bulldozers for grading and dump trucks for hauling rock to build a road to serve the pad site. Subsequently, the rotary rig must be moved to the pad site and assembled on site.

Typically, a rig that can drill a 10,000 foot well will require 35 to 45 semi-trucks to move and 50 to 75 people to assemble the rig.<sup>x</sup> Depending on the availability of rotary rigs and other well development equipment in Mexico, which is believed to be limited, the rigs and equipment will probably be moved from Texas to the Burgos Basin. This would increase the number of Oversize/Overweight loads moving on the Texas transportation system and crossing the Texas-Mexico border – at least over the short term. Over the long term, the machinery involved in well development could potentially be manufactured in Mexico since there is already a strong manufacturing industry present in the country.

Once the drilling of the well hole begins, steel pipe and cement are delivered on site by truck for casing and cementing the well hole to prevent groundwater contamination. Mud used for lubricating the drill is also delivered on site by truck. Depending on the capacity of Mexico's manufacturing plants to produce steel oil field pipe and cement, there may be a significant increase in the imports of pipe through Texas ports, such as the Port of Corpus Christi and the

Port of Brownsville, or from Texas manufacturing facilities. This piping and cement may be moved by rail or truck across the Texas-Mexico border to well sites in the Burgos Basin.

Drilling of the well hole takes about two to three weeks. If the well hole is determined to be economically viable, the well is perforated and hydraulic fracturing begins. Hydraulic fracturing or “fracking” is the process of pumping air, water, chemicals, and sand or other “proppants” under high pressure into the well hole to fracture the shale and stimulate the flow of natural gas, condensate, or crude oil. The sand needed for hydraulic fracturing (frac sand) originates from the Midwestern U.S. states, parts of Canada, and Brazil. In Texas, sand has been imported through the port of Corpus Christi and trucked or railed to the Eagle Ford Shale. For example, Union Pacific (UP) developed a “Sand 2 Shale” program that is expediting sand delivery to the Permian Basin and Eagle Ford Shales.<sup>xi</sup> Oil and gas companies may thus capitalize on these existing distribution networks to move sand into Mexico, which would increase demand at Texas ports (potentially Corpus Christi and Brownsville) and on the rail, highways, and crossings leading into Mexico. Finally, it is speculated that Mexico will most likely be able to run a self-sufficient water industry to meet the demands of hydraulic fracturing. A self-sufficient Mexican water supply means that Texas’ transportation system will likely be unaffected by the water trucks needed for Mexico’s development of the Burgos Basin.

#### *Resource Production/Extraction*

The disposal of salt water is a major traffic generating activity in the natural gas and oil energy supply chains. A natural gas well produces water throughout its life. This is referred to as “*flow back*” water, which is typically trucked from well sites to a salt water disposal wells. The number of truck trips required to haul away the saltwater is largely dependent on the amount of water produced and the size of the truck, but the disposal of salt water is not anticipated to impact the Texas transportation system, because the disposal wells tend to be local.

#### *Distribution*

Currently, there are only six refineries in Mexico. Given the shortage of Mexican refineries and pipelines in the area, it is foreseen that most of the extracted oil will be shipped to refineries in Texas and Louisiana. Oil will be shipped from drill sites by truck to gathering hubs and terminals from where it is foreseen that it will be shipped by rail to the nearest refineries (Texas and Louisiana). The rail systems in the U.S. are already facing challenges with the increase in demand of rail car leases and the new regulations on the safety of crude oil transportation. The U.S. railroads that serve the Gulf Coast, and could eventually handle crude-by-rail from Mexico, are the UP, BNSF Railway, and Kansas City Southern (KCS). Safety of crude-by-rail has also become a concern throughout the U.S. and could become a concern in Texas as crude-by-rail traffic from Mexico’s energy sector increases. Another potential concern is the border crossings. With a greater amount of rail cargo crossing the Texas-Mexico border (inbound and outbound traffic), it will be necessary to address potential capacity issues. These issues could be resolved with additional physical capacity or by using current infrastructure more efficiently – i.e., adding staff and/or technology. The latter requires less funding and could be implemented faster, as the

development of international port-of-entry infrastructure is a lengthy process. Finally, the future energy development needs in the north along the Burgos Basin, especially concerning natural gas development, would require the construction of more pipelines over the long term.

### Concluding Remarks

It is foreseen that the energy reforms and the development of the Burgos Basin can have a significant impact on Texas' transportation system – ports, rail, highways, and border crossings. The impacts stem from U.S. firms expanding their operations and sending drilling equipment into Mexico to shipping oil from Mexico to Texas and Louisiana for processing. These movements could generate substantial freight volumes, consisting of heavy oil field equipment and other materials (such as pipe) from Texas into Mexico, as well as crude from the Burgos Basin to Texas. It is also possible that, during the earliest stages of shale gas and oil production in the Burgos Basin and before companies have the opportunity to invest in infrastructure in Mexico, pipe, frac sand, and chemicals will be transported by truck and/or rail across the Texas-Mexico border. These movements would place new pressures on Texas' transportation system along the border region and on the operations of the state's border crossings.

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- <sup>i</sup> Guzman, Roberto. "Energy Reform in Mexico." Lecture, PIPA Consulting. Cartagena, Colombia. November 15, 2013
  - <sup>ii</sup> As of July 2014, the secondary laws were not presented to Congress for discussion and approval
  - <sup>iii</sup> "EIA: Mexico's energy reform will address many challenges." *Oil & Gas Journal*. May 27, 2014. Accessed June 1, 2014, <http://www.ogj.com/articles/2014/05/eia-mexico-s-energy-reform-will-address-many-challenges.html>
  - <sup>iv</sup> "EIA: Mexico's energy reform will address many challenges."
  - <sup>v</sup> Miroff, Nick. "The fracking divide: Mexico's oil frontier beckons U.S. drillers in wake of new law." *The Washington Post*. April 19, 2014. Accessed May 29, 2014, [http://www.washingtonpost.com/world/the\\_americas/the-fracking-divide-mexicos-oil-frontier-beckons-us-drillers-in-wake-of-new-law/2014/04/19/1951ba0c-e8ff-452d-84bd-d488f730991c\\_story.html](http://www.washingtonpost.com/world/the_americas/the-fracking-divide-mexicos-oil-frontier-beckons-us-drillers-in-wake-of-new-law/2014/04/19/1951ba0c-e8ff-452d-84bd-d488f730991c_story.html)
  - <sup>vi</sup> Mexico Presidencia de la Republica. "Energy Reform: Executive Summary"
  - <sup>vii</sup> Webber, Jude. "Mexico plans \$316bn for infrastructure." *Financial Times*. July 16, 2013. Accessed June 5, 2014, <http://www.ft.com/cms/s/0/df02d3d4-ed9e-11e2-8d7c-00144feabdc0.html#axzz33rWfU31>
  - <sup>viii</sup> Fernández, Vicente. Khokhar, Someera. Goldstein, Sean. Segura Alonsa, José Ignacio. "Open for investment: How Mexico is paving the way for infrastructure investors." *White & Case* Figure 2 Pro Publica Journalism in the Public Interest. "What is Hydraulic Fracturing?" Accessed June 17, 2014, <http://www.propublica.org/special/hydraulic-fracturing-national>
  - <sup>ix</sup> Prozzi, Jolanda., Sergey Grebenschikov, Ambarish Banerjee, Jorge Prozzi. Impacts of Energy Developments of the Texas Transportation System Infrastructure. Conducted by *Center for Transportation Research at The University of Texas at Austin*. Texas Department of Transportation, Austin, TX., 2011. Pp. 135
  - <sup>x</sup> Prozzi, Jolanda., Sergey Grebenschikov, Ambarish Banerjee, Jorge Prozzi. Impacts of Energy Developments of the Texas Transportation System Infrastructure. Conducted by *Center for Transportation Research at The University of Texas at Austin*. Texas Department of Transportation, Austin, TX., 2011. Pp. 135
  - <sup>xi</sup> Sobczak, Blake. "Hydraulic Fracturing: Rail Arteries make or break frac sand growth in Midwest."