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Mexican Energy Revolution: But is it a Solution?

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*by Katrina Tomecek**

Introduction

Mexico's recent energy reform has received much praise for the economic benefits it promises to bring, but one piece of the puzzle most politicians seem to overlook is the environmental impact that will result and the issues with postponing the inevitable: the need to look to alternative resources.[1] With its ample sun and wind resources, Mexico would be an ideal candidate for transitioning to greener energy. However, without strategic planning the country's energy reform will threaten to un-do recent progress towards the transition to renewable resources.

Overview of the Reform

For the past 76 years PEMEX has enjoyed a monopoly over Mexico's oil.[2] As a result of recent constitutional reforms, that trend will not continue and Mexico's oil will open up to foreign investment.[3] Twenty-one laws were passed over the summer to help ensure the constitutional reforms become law.[4] As a result of this reform, economists hypothesize that Mexico will see a two percent increase in GDP in the next ten years and an addition of two million jobs.[5] There has also been excitement surrounding the idea of partnering with Canada and the United States to create a "North American energy superpower" in order to mutually benefit all three countries' economies and bring down costs of energy.[6]

Problems with the Planning

Though this plan sounds promising, there are two major environmental issues that the country must take into consideration during this reform: 1) the potential for pollution and environmental destruction from increased harvesting of fossil fuels; and 2) distraction from the need to continue to rely on renewable sources.

Among the direct environmental impacts of this reform are the concerns of pollution from exporting, destruction to sensitive ecosystems, and contamination of vital farmlands.[7] Much of the remaining oil in Mexico is located in deep-sea oil reserves, and a significant amount of remaining shale sources are trapped in areas of geologic complexity.[8] Thus, recovery would involve invasive techniques (such as fracking) in order to reach them. Fracking brings with it a number of concerns including the contamination of soil and water supplies and the exhaustion of Mexico's already stressed water reserves for use during the injection process.[9] Further, it should not be forgotten that the BP oil spill in 2010 is not in Mexico's too distant past. With continued stretching of technology to drill deeper and deeper under the ocean, it is not unlikely that such an event will repeat itself at least on a small scale.[10]

On the front of renewable energy resources, Mexico has the potential to be a leader. The country has shown an interest in making this transition in the adoption of the 2012 Climate Change Act,[11] but concern has been raised about whether its newest energy reform will hinder that progress. Statistical studies predict that both crude oil and natural gas will be depleted in Mexico in less than 10 years and thus it is imperative that renewables remain a priority.[12] Ignoring the need for this transition will continue to increase CO2 levels and will be progressively more costly. Further, though Mexico adopted legislation that would seem to encourage simultaneous development of renewables, it made it clear that it is primarily concerned with financially investing in continued development of pipeline infrastructure for natural gas.[13] New fees levied on power firms by Mexico's new energy council (Cenace) also make it clear that the intent of the reform is not to make solar energy a priority.[14]

Future Focus

Though it is not realistic to expect Mexico to undo its recent legislation, it should approach this reform with very specific regulations and plans to create future benefits that are both economic and sustainable. Careful regulations need to be considered and strictly adhered to for extracting Mexico's oil. In-depth scientific research should be done before permitting any extracting to determine whether the surrounding ecosystem or community will be harmed and to what degree. It should also be acknowledged that shifting to green energy would serve as a strength and not a hindrance.[15] Making this transition will create more jobs, save money from expensive fuel extraction, allow for more profiting from exporting unused fuel sources, and it will eliminate wasting money on spills and contamination.[16]

Mexico also needs to ensure it forms uniform CO2 emission standards with the rest of North America if an energy partnership is created. It has made simultaneous promises regarding renewables, but actions speak louder than words and it appears that renewables are on the back burner in this equation. In order to fully benefit from this reform and to create lasting growth, Mexico needs to focus on creating a symbiotic relationship between the continued development of hydrocarbons and transitioning to greener energy in which a certain percentage of profits from the reform are designated to be invested in development of renewable infrastructure. Finally, Mexico needs to make sure it is not getting caught up in the anticipated gold-rush and allowing it's environment to be permanently damaged in the process.

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Endnotes: Mexican Energy Revolution: But is it a Solution?

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[1] Kent Paterson, *Does Mexican Energy Reform Invite Ecocide?*, Newspaper Tree (Dec. 14, 2013), http://newspapertree.com/articles/2013/12/14/does-mexican-energy-reform-invite-ecocide.

[2] Adam Williams, *Mexico Oil Opening May Release Gusher for Foreigners*, Bloomberg (May 13, 2014, 12:01AM), http://www.bloomberg.com/news/2014-05-13/mexico-oil-opening-may-release-gusher-for-foreigners.html.

[3] Will Grant, *Mexico Energy Reform Divides Opinion*, BBC News (Aug. 14, 2014, 6:27PM), http://www.bbc.com/news/business-28785506.

[4] Diana Villiers Negroponte, *Mexico's Energy Reforms Become Law*, Brookings (Aug. 14, 2014) http://www.brookings.edu/research/articles/2014/08/14-mexico-energy-law-negroponte.

[5] Everett Rosenfeld, *Mexico to Receive Major Economic Jolt, Experts Say,* CNBC (Aug. 26, 2014, 2:23 PM), http://www.cnbc.com/id/101948520.

[6] Juan Gavasa, *North America Should Look to Nafta on Oil Boom, Pemex CEO Says,* Panamericanworld (Feb. 17, 2014), http://www.panamericanworld.com/en/article/north-america-should-look-nafta-oil-boom-pemex-ceo-says.

[7] *See* Negroponte *supra* note 4

[8] *See* EIA, *Mexico*, U.S. Energy Information Administration (April 24, 2014), http://www.eia.gov/countries/analysisbriefs/Mexico/mexico.pdf (stating most of the remaining oil reserves in Mexico exist offshore and that a considerable amount of hydrocarbon resources are hypothesized to be in deepwater within the Gulf of Mexico and further emphasizing that the amount of recoverable shale gas is considerably less than the total resource base because it is located in regions with complex geology).

[9] AAN Editors, *Renew or Ruin? Mexico's Energy Reform*, The Global Call For Climate Action (Sept. 17, 2014) http://adoptanegotiator.org/renew-or-ruin-mexicos-energy-reform/.

[10] *See* Claire Ribando Seeke et al., *Mexico's Oil and Gas Sector: Background, Reform Efforts, and Implications for the United States*, CRS Report (Nov. 18, 2013) *available at* http://fpc.state.gov/documents/organization/218980.pdf (warning about the implication of hydraulic fracturing of Mexico's remaining hard to reach hydrocarbon resources). *See also* Madelon L. Finkel et al., *The Rush to Drill for Natural Gas: A Public Health Cautionary Tale*, American J. of Public Health (May 2011) *available at* http://www.fraw.org.uk/files/extreme/finkel_law_2011.pdf (noting that toxic mud, fluid byproducts, and oil spills resulting from fracking are not uncommon).

[11] Ley General de Cambio Climático [LGCC] [Climate Change Law], Diario Oficial de la Federación [DO], 06 de Junio de 2012 (Mex).

[12] SERN, *Mexico (2014): Energy Sources*, Reegle (last visited Nov. 11, 2014) http://www.reegle.info/policy-and-regulatory-overviews/MX.

[13] Editors of EL&P/ POWERGRID, *Mexico Energy Reforms Leave Solar Power Behind,* Elp.com, (Sept. 18, 2014), http://www.elp.com/articles/2014/09/mexico-energy-reforms-leave-solar-power-behind.html.

[14] *See id*.

[15] *See* Sergio Romero-Hernández et al., *Renewable Energy in Mexico: Policy and Technology for a Sustainable Future*, Wilson Center, 63 *available at* http://www.wilsoncenter.org/sites/default/files/Renewable_Energy_in_Mexico.pdf (stating that though taking action to implement green energy is costly, inaction will be even more costly).

[16] Id. at 64

Endnotes: Avoiding Epimetheus: Planning Ahead for the Commercial Development of Offshore Methane Hydrates

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[26] *See* J. F. Gabitto & C. Tsouris, *Physical Properties of Gas Hydrates: A Review*, 2010 J. Thermodynamics 1, 1 (2010); Moridis et al., *supra* note 4, at 2; Zhang et al., *supra* note 15, at 934.

[27] Much of the oil and gas industry utilizes Imperial Units instead of metric measures. One m3 of natural gas is generally deemed equivalent to thirty-five ft3 for commercial exchanges. *See* Dawe & Thomas, *supra* note 15, at 221. The BP Statistical Reviews lists the exchange ratio as 1 m3:35.3 ft3. *See BP Statistical Review of World Energy*, bp 44 (June 2013), http://www.bp.com/content/dam/bp/pdf/statistical-review/statistical_review_of_world_energy_2013.pdf [hereinafter *BP Statistical Review*].

[28] *BP Statistical Review*, *supra* note 27, at 20.

[29] Moridis et al., *supra* note 4, at 3.

[30] Englezos & Lee, *supra* note 9, at 674.

[31] *BP Statistical Review*, *supra* note 27, at 20-22. Also, these numbers can be contrasted against the annual energy demand budget for the U.S.A., which is one Tcm annually. *See* Moridis et al., *supra* note 4, at 3.

[32] *See infra* Table 1 (Comparing the U.S. estimate for methane hydrates against the BP estimate for booked natural gas reserves).

[33] *See* Walsh, *supra* note 7, at 815.

[34] Englezos & Lee, *supra* note 9, at 673.

[35] *Id*.

[36] Zhang et al., *supra* note 15, at 934; Moridis et al., *supra* note 4, at 2.

[37] Englezos & Lee, *supra* note 9, at 674.

[38] Estimate was stated as 6.4 Trillion tons of methane. Demirbas, *supra* note 6, at 1551.

[39] Marcelle-De Silva & Dawe, *supra* note 2, at 221.

[40] Referred to as the standard estimate, partially due to their age. MacDonald's numbers date from 1990. *Id.* at 219.

[41] This number is actually a statutory statement regarding the U.S.'s internal estimate of its own domestic supplies, which it estimates at a quarter of the world's supplies of methane hydrates. It provides an estimate of the domestic volumes at 200,000 Tcf. 800,000 Tcf converts to 24,000 Tcm. *See* 30 U.S.C. § 2001(2)-(3) (2014).

[42] Referred to as the most up-to-date model and likely the most accurate. Marcelle-De Silva & Dawe, *supra* note 2, at 219.

[43] *See* Englezos & Lee , *supra* note 9, at 674.

[44] Gabitto & Tsouris, *supra* note 26, at 2.

[45] Dawe & Thomas, *supra* note 15, at 219.

[46] *Id.*

[47] The United Nation's Convention on the Law of the Sea, sec. 2, art. 3, September 5, 2013 *available at* http://www.un.org/Depts/los/convention_agreements/texts/unclos/part2.htm.

[48] *Id*. at part V, art. 57 *available at* http://www.un.org/Depts/los/convention_agreements/texts/unclos/part5.htm.

[49] Moridis et al., *supra* note 4, at 3.

[50] *Id.*, at 23. *See also* Koh, supra note 17.

[51] Moridis et al., *supra* note 4, at 3. *See also* discussion on Japanese efforts in development in both the discussion on hazards from methane projects, *infra* Subsea Seppage of Methane .

[52] Dawe & Thomas, *supra* note 15, at 223; Moridis et al., *supra* note 4, at 2, 12-17; Marcelle-De Silva & Dawe, *supra* note 2, at 227.

[53] Lee & Holder, *supra* note 18, at 185; Marcelle-De Silva & Dawe, *supra* note 2, at 227. This method found practice at the Siberian field of Messoyhaka for several decades.

[54] Walsh et al., *supra* note 7; Moridis et al., *supra* note 4, at 2, 12-17; Marcelle-De Silva & Dawe, *supra* note 2, at 227.

[55] Dawe & Thomas, *supra* note 15, at 223; Koh, *supra* note 17, at 165-166; Walsh et al., *supra* note 7; M. J. Castaldi et al., *Down-Hole Combustion Method for Gas Production from Methane Hydrates*, 56 J. Petroleum Sci. & Engineering 175, 177 (2007); Englezos & Lee, *supra* note 9. Endothermic reactions require energy to be added for the reaction to occur. Exothermic reactions release energy as they occur. Fifty kJ/mol of energy is required to separate methane from the hydrate formation. Larger molecules require more energy; e.g., propane requires 130 kJ/mol. Lee & Holder, *supra* note 18, at 185.

[56] M. Kurihara, et al., *Gas Production from Methane Hydrate Reservoirs*, *in*: Proceedings of the 7th International Conference on Gas Hydrates (2011); Marcelle-De Silva & Dawe, *supra* note 2, at 227.