With a Little Help from My Friends

Big Changes in Mexico/ U.S. Energy Interactions

- **Energy relations between Mexico and the U.S. are being transformed, to the benefit of both countries.**
- **Mexican crude oil exports to the U.S. are down and a heavy-for-light oil swap is in the works.**
- **Ever-increasing volumes of Eagle Ford and Permian natural gas are flowing South of the Border to meet Mexico's growing natural gas power generation demand; more gas pipelines are being built.**
- **Mexican refineries cannot produce enough transportation fuels to meet domestic needs, spurring significant refined product imports from the U.S.**
- **Imports of LPG from the U.S. to Mexico are growing and expected to benefit from ongoing deregulation of the domestic market.**
- **The opening up of Mexico's energy sector to private, foreign investment and participation is creating multiple opportunities for U.S. and other firms.**

The strong, long-standing energy relationship between the U.S. and Mexico has been undergoing a dramatic transformation. Mexican crude exports to the U.S. are off sharply, exports of U.S. natural gas, transportation fuels and liquefied petroleum gas to Mexico are rising fast, and Mexico has been reforming and opening up its energy sector, which for decades has been dominated by state-owned Petróleos Mexicanos, or Pemex.

The fall-off in Mexican crude oil exports to the U.S. is tied mostly to declining production of heavy crude in older Mexican fields such as the offshore Cantarell, although the U.S. has become more self-sufficient in the past four years as a result of the surge in shale production. Most shale crude is very light and unlikely to push out heavy Mexican supplies unless refinery configurations change. Recent approval for a crude swap arrangement will result in the first U.S. exports of light crude to Mexico in return for heavy crude imports. Similarly, rising U.S. exports of natural gas—both by pipeline to Mexico and soon by ships carrying liquefied natural gas (LNG) to Asia, Europe and Latin America—are a direct result of burgeoning U.S. gas production, including in the Eagle Ford and the Permian Basin, both of which are close to the U.S./Mexico border. U.S. exports of gasoline, diesel, liquefied petroleum gas (LPG) and other refined products to Mexico are up not only because Mexico's economy is growing, but because Pemex's refineries are unable to keep up with domestic demand and need to be modernized and expanded.

Figure 1 provides an overview of Mexico's energy infrastructure, including gas pipelines, oil pipelines, refineries, power plants, and LNG import terminals.

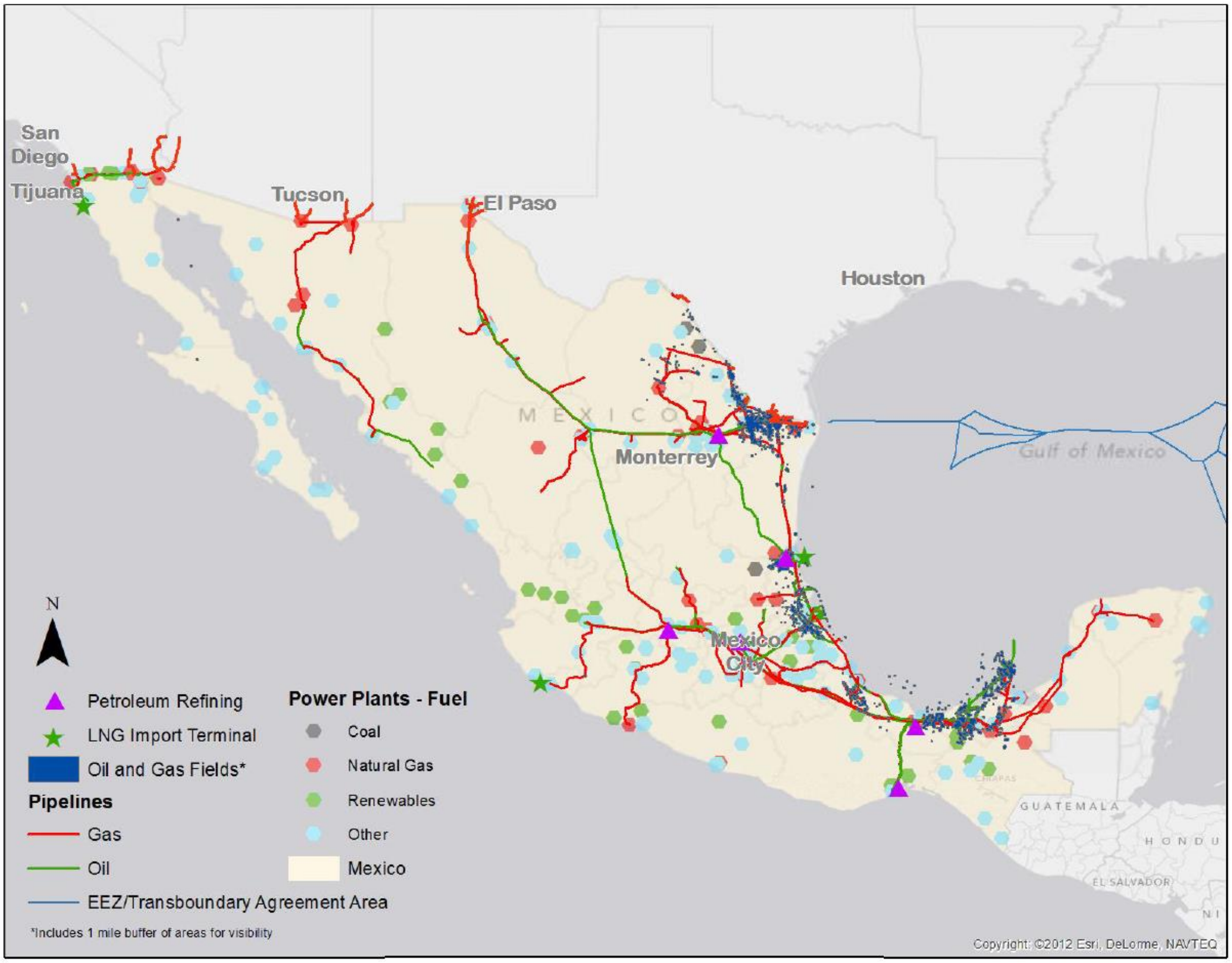

Figure 1 – Overview of Mexico's Energy Infrastructure; Source: Congressional Research Service, September 2015 Report Mexico's Oil & Gas Sector

Perhaps a greater opening for U.S. oil producers is Mexico's ongoing effort to boost domestic output of oil and gas by inviting private, foreign investment and participation in oil and gas exploration/production. Also, for U.S. midstream companies, Mexico has been welcoming foreign involvement in billions of dollars of new natural gas pipeline projects; several such projects already are under way and many more are planned.

The changing dynamics of U.S./Mexico energy interactions also hold promise for Mexico. Access to vast quantities of imported natural gas from the Eagle Ford, the Permian Basin and other U.S. shale plays is enabling Mexico to expand and modernize its power generation sector by building thousands of megawatts of new, gas-fired power plants, and to shift many industrial, commercial and residential customers to gas from dirtier, less efficient fuels. Mexico also benefits by securing the gasoline, diesel, LPG and other refined products it needs to supplement its own production—and to get them from a friendly, reliable source. The Mexican government's decision to encourage U.S. and other foreign investment in oil and gas exploration and production will likely help Mexico reverse recent production declines, and give new life to Mexico's economy in general. Longer term, U.S. shale-gas producers may be called in to help Mexico recreate in the Burgos shale region (in northeastern Mexico, just south of the Eagle Ford) what they have accomplished north of the Rio Grande. That, of course, could have the effect of reducing U.S. gas exports to Mexico, but for a variety of reasons wide-scale development of the Burgos is likely many years away.

In essence, Mexico has been rapidly converting from a net energy exporter to the U.S. (mostly in the form of crude oil) into a country that exports a lot less crude to the U.S. and imports a lot of natural gas--and quite a bit of transportation fuel and LPG too. Mexico has tremendous potential to become energy self-sufficient. As of year-end 2015 it had about 10 billion barrels (BBbl) of proved oil reserves, 17 trillion cubic feet (Tcf) of proved natural gas reserves, and—maybe most promising of all—nearly 400 Tcf of technically recoverable shale gas in the Burgos region. Despite all that promise, however, Pemex's state-owned nature and all the inefficiencies and political pressures that come with that have slowed efforts to find and develop new oil fields, and drug cartel-related violence and lack of water and pipeline infrastructure have left the Burgos shale play largely untapped. The refinery situation is not any better: investments in refinery upgrades that would enable Pemex to produce additional much needed, high-value gasoline and diesel (and less unneeded, low-value fuel oil) have been slow in coming.

There are two general themes running through recent developments in Mexico/U.S. relations. One is that the renaissance of U.S. energy production, driven by technological advances and unfettered competition, has spurred interest in finding new export markets. The other is that Mexico's decades-old effort to nurture and grow its energy sector solely through state ownership of Pemex appears to have run its course, and that recent and ongoing efforts to encourage private, foreign investment aim to reverse the energy-production stagnation Mexico has been experiencing.

This Drill Down report considers each major sector of U.S./Mexico energy relations in turn, beginning with crude oil and transportation fuels, followed by natural gas and LPG. The report then reviews Mexico's energy sector reform plan, and concludes with an analysis of what likely lies ahead.

The Table of Contents for "With a Little Help from My Friends: Big Changes in Mexico/ U.S. Energy Interactions" is included on the following page.

Table of Contents