

Delaware Review of Latin American Studies

Vol. 11 No. 2 December 30, 2010

Mexico: A Nation at Risk

Jude Clemente, M.S.
Energy Security Analyst
Homeland Security Department
San Diego State University
judeclemente21@msn.com

Abstract

Mexico's continued economic growth faces considerable obstacles. The country confronts an expanding population and vehicle fleet that will push the capacity of urban infrastructure even closer to the brink. Mexico has been a leading oil producer for decades, but this is being forced to change at a time when record revenues support social programs and help combat drug-related violence. Officials have a major chance at redemption looming on the horizon, however, as the manner in which Mexico responds to its oil crisis could very well determine the country's fate.

Keywords: PEMEX, Cantarell, Felipe Calderón, 2008 energy reforms, infrastructure

"...the crisis caused by the fall in oil production in Mexico has consequences that go far beyond PEMEX and the Mexican government. The fall in oil production is accelerating, which means that Mexico will become a net importer of oil earlier than most people had predicted. This has far-reaching consequences for PEMEX's financial health and for government revenues, but also for the Mexican economy and jobs"

*Duncan Wood, Senior Associate,
Center For Strategic & International Studies (November 30, 2009)*

Background

Mexico is rapidly emerging on the global stage. According to Goldman Sachs, by 2050, Mexico's economy will have evolved from the 13th to the 5th largest in the world--behind China, the United States, India, and Brazil (Corchado and Solis, 2008). Grant Thornton International puts Mexico below only China, India, and Russia in terms of opportunities for investment and development (Grant Thornton International, 2009). Basing its strategy on liberalized trade, Mexico continues to push for closer trade relations with the United States, Western Europe, and Asia. Mexico has negotiated 14 free trade treaties (the most in the world) with over 40 nations.

The North American Free Trade Agreement (NAFTA), signed by the governments of Mexico, Canada, and the United States in 1994, created a trilateral trade bloc in North America and opened up huge markets for Mexican-made goods. "The stability of the past decade-plus has allowed financial markets and banks to grow up. Mortgages exist now. People can get loans. There has been a birth of a middle class in Mexico," says Gray Newman, head economist for Latin America at Morgan Stanley (Hawley, 2008). Mexico has lowered its dependence on the financial well-being of the United States and has far bettered positioned itself to recover from the current global economic downturn. In fact, Mexico's Central Bank recently increased the country's 2010 economic growth forecast to 5% (Gould and Martinez, 2010).

Many credit Mexico's economic advance to its maturation to a multiparty democracy. In 2000, Vicente Fox, of the conservative National Action Party (PAN), became Mexico's first president from outside the Institutional Revolutionary Party in 70 years. Current President Felipe Calderón's, also a member of the PAN, \$100 billion (all \$ in USD) annual investment in human capital is giving Mexican families the opportunity to better the education, health, and nutrition of their children (Corchado and Solis, 2008). Mexico has steadily cut its external debt, and citizens are finding it easier to secure a government loan.

Unfortunately, Mexico's progress is now at risk. It is becoming increasingly clear officials did not anticipate many of the changes taking place within the country. The present analysis examines the four most critical issues that Mexico must confront in the attempt to sustain its upward economic trajectory for the long-term: 1) Loss of Oil Revenues, 2) Population Increase, 3) Urbanization Issues, and 4) Vehicle Growth.

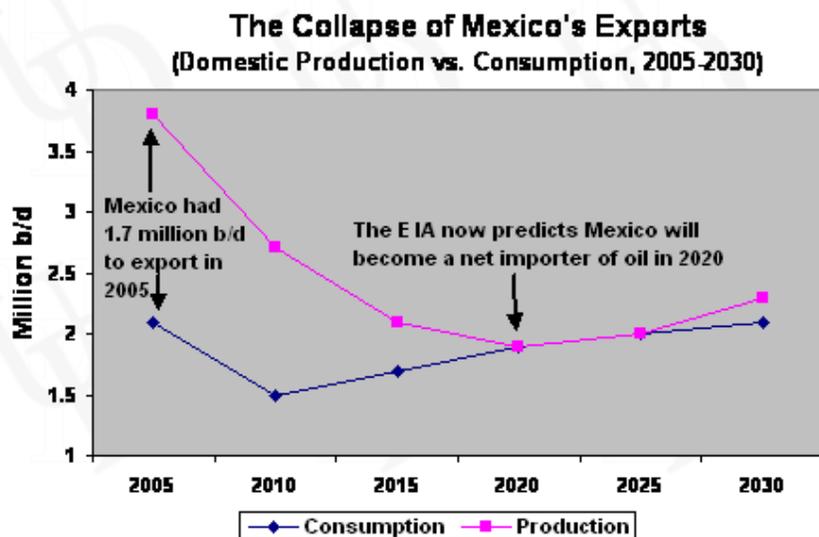
1. Loss of Oil Revenues

For the past 30 years, the giant offshore oil field, Cantarell, secured Mexico's position as a top-three U.S. oil supplier and has accounted for 60% of the country's total production. In 2000, the national oil company, *Petróleos Mexicanos* (PEMEX), implemented a nitrogen injection plan to reverse a production slump at its most vital resource--and Cantarell's output peaked at 2.1 million barrels per day (b/d) in 2004. But, enhancement techniques are simply short-term solutions because they can easily result in reservoir damage and reduce the amount of oil that can ultimately be recovered from a field. Cantarell is currently producing just 550,000 b/d and is in a state of terminal decline.

As Mexico's focus now shifts to other oil areas, it is becoming more and more apparent that *Cantarell* was the epitome of a "low hanging fruit." President Calderón's 2008 energy reform bill, aimed at developing new resources, does not establish specific strategies to foster deepwater exploration alliances with international oil companies. PEMEX lacks both the technology and expertise required to tap the deepwater resources on its side of the Gulf of Mexico--the region where its most promissory fields are located. Constitutional restrictions on foreign investment are hindering the full development of Mexico's oil industry. Proper reinvestment in oil production capacity is impractical because the federal government takes away 60% of PEMEX's revenues via royalty payments and taxes. Broader reforms are needed.

Figure 1 illustrates the economic quandary materializing in Mexico, mostly due to the sudden collapse of Cantarell. Oil sales are Mexico's largest source of foreign income and constitute 40% of the federal government's budget. Without the timely discovery and market delivery of new reserves, Mexico stands to lose hundreds of billions of pesos in revenues (PEMEX revenues in 2009 were \$85 billion). The country will be hard pressed to maintain social programs and economic expansion. In its latest forecast, the Energy Information Administration (EIA), the statistical arm of the U.S. Department of Energy, projects Mexico's domestic oil production and consumption will cancel each other out in 2020.

Figure 1



Source: Energy Information Administration, 2009

The EIA (2009) expects Mexico's oil demand to soar by 33% in the next 15 years, compared to only a 10% increase in the last 20 years. Decreasing production and increasing consumption will make the country more vulnerable to economic dislocation. Oil sales pay for schools, roads, hospitals, and other critical infrastructure. Any decrease in income for the federal government could shatter the newfound, still fragile confidence Mexicans hold and spark a humanitarian crisis in a nation in the midst of a population swell.

2. Population Increase

Figure 2 demonstrates how much younger and faster growing Mexico's population is than its North American allies.

This demographic change will alter the face of the country, and indeed the continent, in the years ahead. At its current rate of growth, in 2030, Mexico's population will be closer to 150 million than the 130 million projected by The World Bank. Medical advancements and higher sanitation standards have raised the average life expectancy of citizens, and an expanding economy has given many males less of a reason to leave their families by "Going North" for the better wages of the United States.

Figure 2 -- **The Rise of Mexico: A 2010 North American Population Comparison**

Population Data	Mexico	U.S.	Canada
Population 2010	111 million	307 million	33 million
0-14 yrs %	30	20	16
15-64 yrs %	64	67	69
65 + years %	6	13	15
Annual growth %	1.15	0.97	0.82
Median Age	26	37	41
Population 2030	128 million	360 million	40 million

Sources: Central Intelligence Agency 2010 (a, b, c) and The World Bank, 2010

In fact, Mexico is now facing an influx of nationals returning from the United States. Widespread layoffs, dwindling employment opportunities, and a crackdown on undocumented immigrants are forcing many Mexicans to return to a homeland they have not known for years. This mass arrival could drive down wages in the country and put added pressure on social services. The country's capacity to adequately handle the heightened demand for housing, jobs, schools, and other necessities is in doubt.

The recession the U.S. economy is still struggling through has many returnees believing they will need to stay in Mexico for at least the foreseeable future. Indeed, on top of fading oil revenues, Mexico is contending with lowered remittance transfers. Money sent back to Mexico from its citizens living in the United States is the country's second largest source of foreign income. After increasing without exception from 1996 to 2007, Mexico's Central Bank reports 2009 remittances totaled \$21.2 billion, a 15% drop from 2008 (Associated Press, 2010). Transfers so far this year are down nearly 20%.

More people and fewer resources will increase Mexico's exposure to the traditional effects of overpopulation. Literacy rates, infant mortality rates, job creation, waste matters, and health and living standards are all social development indicators Mexico has made solid progress on in recent years. An increasing population, however, will create a greater need to exploit the environment for more food, clothes, housing, and industrial use. Land and water pollution will be even more difficult to contain. The significant challenges at hand are clearly in focus.

3. Urbanization Issues

Economic success has sparked fast urbanization in Mexico. Today, about 76% of the population lives in cities, compared to 61% in 2000 (U.S. Department of State, 2010). As neighborhoods, known as *colonias*, spring up on the perimeter of a city, they are quickly usurped by its sprawling expansion. Unfortunately, because Mexico had no comprehensive plan to manage the transformation, infrastructure development has been given little chance of keeping pace. Profiling three of Mexico's main population centers highlights the types of problems that need promptly alleviated.

A) Mexico City, on a mega-scale, exemplifies the urban issues in Mexico. The capital city of over 20 million people exhibits all the problems of unchecked growth: unplanned development, severe pollution, insufficient housing and services, and high population densities. This leviathan of a metropolis inconveniently disperses out like a giant octopus, as the world's second largest city continues its haphazard advance. Mexico City is sinking into the ground at a rate of three to four inches each year because aquifers are being emptied faster than they can be refilled (Associated Press, 2007). Grillo (2009) reports this gradual plunge is putting "extra pressure on water distribution

pipes, which are now so leaky they lose about 40% of liquid before it even reaches homes.”

Traffic and air pollution are so extensive in Mexico City that each vehicle is awarded a sticker indicating which day of the week it can be driven. Vehicle use in the city is rising, as the subway system, although cheap, is too crowded and does not reach outlying areas. A study by the U.S. National Institute of Statistics indicated the number of vehicles in Mexico City doubled to four million from 2000 to 2007 (Barclay, 2008). Rosenberg (2008) notes the impact the resulting smog is having on the health of residents--a problem aggravated by the city's 7,350 foot elevation. Ozone levels in Mexico City fail to meet World Health Organization standards on more than 300 days of the year (Luck, 2008).

B) Tijuana is less than 20 miles south of San Diego, California. This dynamic border city is experiencing a population upsurge that its budget simply cannot absorb (Cearley, 2006). Many migrants are relocating to Tijuana and other parts of northern Mexico to work in the prospering *maquila* industry that has sprung up along the U.S. border. Infrastructure formation has been lagging. Tijuana's challenging terrain makes the nonstop land invasions, and the need to retrofit neighborhoods, expensive and risky--the city is extending dangerously out of control. Shack-like windowless homes perched high on hilltops sit on the verge of collapse, and some fear the city is a heavy downpour away from catastrophe. Many residents have no or limited access to sewer service. The city's waste often drains onto streets and into the Tijuana River, putting local residents at higher risk of developing hepatitis and gastrointestinal diseases.

The U.S. Environmental Protection Agency (2009) states Tijuana's surge in population and industrialization has "exceeded the existing infrastructure, leading to inadequate potable water distribution, wastewater collection, and wastewater treatment." Tijuana's population has doubled in the past decade, and new residents to the city are often forced to find housing in squatter developments where indoor plumbing and electricity are not available. Slowing the city's escalating drug-related violence, notoriously, has been forced to the forefront of the public's consciousness. The recent crackdown on Tijuana's Felix cartel has unleashed a turf war between rival drug gangs that neither the police nor the military can control.

C) Ciudad Juárez rests between two mountain ranges and the flat riverbanks of the Rio Grande in the northern Mexican state of Chihuahua. Officials in this fast-growing border city are also preoccupied with a drug turf war and high crime rate. More than 2,500 people were killed in Ciudad Juárez last year alone, making it the most violent city in the world outside those in declared war zones (AFP, 2009). President Calderón recently dispatched over 5,000 troops and 400 federal police officers to the city to help slow the assault (Ellingwood, 2009). The murder of two U.S. consulate workers in March, however, is a public symbol of the mounting concern that the President's strategy to stop Mexico's drug cartels is veering off course.

Indeed, infrastructure development is also basically an afterthought in Ciudad Juárez. The city has had chronic water shortages stemming from the rapidly changing economic and weather conditions (Fullerton et al., 2006). As a main entry point into the United States, Ciudad Juárez has a vast amount of trucks, buses, and vehicles that have degraded its air quality. Mayor José Reyes Ferriz's administration has drafted a set of goals for a joint committee (with El Paso, Texas) to attack the pollution issue that has plagued local governments for years. Ciudad Juárez has an estimated 25,000 families using high fuel-consuming U.S. castoff vehicles (Dickerson, 2008). Removing some of these "clunkers" from city streets is one of Ferriz's primary goals. More such vehicles are on their way, however, as vehicle use throughout the entire country is projected to multiply at an alarming rate.

4. More Vehicles

Largely because public transportation systems are short and cities extend out amorphously, more vehicles are hitting the roads in Mexico than ever before. As the population inflates and social programs give more citizens greater purchasing power, this rise will surely accelerate. Public transportation is overburdened and generally constrained to the city's core. A vehicle is usually the only way to get from one place to another within the urban areas of Mexico. Gasoline consumption is expected to increase by 60-70% from 2008-2016 (Table, 2008).

In their noteworthy 2007 study, *Vehicle Ownership and Income Growth, Worldwide: 1960-2030*, Dargay et al. researched the vehicle use trends of 45 nations. Mexico by far has the greatest projected vehicle growth among those with a similar population size. In fact, Mexico's average annual growth rate of 5% is higher than 70% of the countries examined and nearly double that of the United States and Canada combined.

The research group predicts Mexico will have 66 million vehicles on its roads in 2030--an astounding increase of over 300% in a generation and a total higher than all but five of the countries analyzed. By that time, Mexico will have easily surpassed Canada, Germany, Spain, France, Great Britain, and Italy in terms of absolute number of vehicles.

It is apparent, however, transportation development will remain constrained. With Mexico already lacking the necessary infrastructure to support its mounting population, a sharp increase in the number of vehicles could grind cities to a halt.

Further, those vehicles that consumers in the United States have deemed as “gas-guzzlers” are finding new life in Mexico. NAFTA enabled Mexico to import more used vehicle models from its northern neighbor that are up to 15-years-old. In recent years, over three million late-model used vehicles from the United States have rumbled legally into Mexico due to lowered trade barriers (Dickerson, 2008). Many of these older models devour gasoline at a much faster rate than the cleaner, more efficient ones of today. According to the EIA, Mexico’s carbon dioxide emissions from oil will increase 34% from 2010 to 2030--the highest projected percentage jump of any country except India, China, and Brazil.

The congestion and poor road conditions that are commonplace in the cities of Mexico augment the country’s costly wasted fuel problem. The money earmarked for fuel subsidies each year is more than what the country spends on education. Mexico pays out an estimated \$6 billion a year importing over 40% of its gasoline (Business News Americas, 2009). This may be a seemingly paradoxical habit for a country that, despite falling production, still yields a tremendous amount of oil. But, in fact, it is a prime example of a consistent lack of planning. Refinery shortages and other downstream issues are blocking the full productivity and potential of Mexico’s oil industry. PEMEX has only six refineries and has not built a new unit in over 30 years. By comparison, the United States has approximately 150 refineries.

Conclusion

Both challenges and opportunities lay ahead for Mexico. The required shift to a less nationalistic oil industry appears difficult but feasible. Resource nationalism is engrained in Mexico’s cultural fabric, and ever since PEMEX first came onto the scene in 1938, changes in the company’s methods of operations are taken as threats to national security. Importantly, however, there is recent precedent for such a changeover, most notably from Norway and Brazil. Not too long ago, industrial growth in these countries was also being thwarted by overly nationalistic oil production laws, but expanded private partnerships allowed their state-owned companies to flourish. Norway and Brazil are now two of the world’s leading producers of deepwater oil. Although limited, Mexico’s 2008 energy reform bill itself indicates the country’s oil industry is capable of evolving.

Fifteen years removed from the “Tequila Crisis,” the “Peak Oil” scenarios that confront both Mexico and the United States present a unique opportunity for collaboration. Going forward, Mexico’s goal is to transform the very structure of its economy for the long-term. This strategic partnership would help spark Mexico’s gradual transition to a more sustainable growth trajectory and a low-carbon economy--the United States is a global leader in “green” energy development. But first, Mexico must take the initiative by: 1) implementing institutional reforms to increase the functionality of its fledgling democracy, 2) strengthening the rule of law to ease corruption and extend foreign investment opportunities, and 3) investing in physical infrastructure, human capital, and technological development. For at least the mid-term, the financing of such projects could come from Mexico’s still substantial hydrocarbon resource base.

References

AFP. (2009, December 15). Drug-related violence, bombings kill 50 in Mexico. Google News. Retrieved March 16, 2010 from <http://www.google.com/hostednews/afp/article/ALeqM5hKYKiAKOu9PnfCVsMRMZiUaTPxcQ>.

Associated Press. (2007, July 9). Massive sinkhole opens in Mexico City. MSNBC. Retrieved March 28, 2010 from <http://www.msnbc.msn.com/id/19682106/>.

Associated Press. (2010, March 1). Mexico’s remittances continue to fall. *BusinessWeek*. Retrieved March 8, 2010 from <http://www.businessweek.com/ap/financialnews/D9E5V7VO3.htm>.

Barclay, E. (2008, January 16). Car Use Doubles in Mexico City in Last 7 years. *Cars & Transportation*. Retrieved February 21, 2010 from http://www.treehugger.com/files/2008/01/car_use_doubles.php.

Business News Americas. (2009, September 28). Pemex gasoline imports make up 40% of domestic sales in August. Retrieved March 15, 2010 from http://www.bnamericas.com/news/oilandgas/Pemex_gasoline_imports_make_up_40*_of_domestic_sales_in_August.

Cearley, A. (2006, July 19). Tijuana addresses problems of potholes with new machines. *The San Diego Union-*

Tribune. Retrieved March 2, 2010 from http://sports.uniontrib.com/uniontrib/20060719/news_1m19potholes.html.

Central Intelligence Agency. (2010)a. The World Factbook – Canada. *CIA – The World Factbook*. Retrieved February 29, 2010 from <https://www.cia.gov/library/publications/the-world-factbook/geos/ca.html>.

Central Intelligence Agency. (2010)b. The World Factbook – Mexico. *CIA – The World Factbook*. Retrieved February 29, 2010 from <https://www.cia.gov/library/publications/the-world-factbook/geos/mx.html>.

Central Intelligence Agency. (2010)c. The World Factbook – United States. *CIA – The World Factbook*. Retrieved February 29, 2010 from <https://www.cia.gov/library/publications/the-world-factbook/geos/us.html>.

Corchado, A., and Solis, D. (2008, April 22). In Dallas speech, Calderón defends immigrants but says Mexico must do better. *The Dallas Morning News*. Retrieved March 23, 2010 from <http://www.dallasnews.com/sharedcontent/dws/dn/latestnews/stories/042308dntexcalderon.1195d82.html>.

Dargay, J., Gately, D., and Sommer, M. (2007, January). Vehicle Ownership and Income Growth, Worldwide: 1960-2030. New York University. Retrieved February 25, 2010 from http://www.econ.nyu.edu/dept/courses/gately/DGS_Vehicle%20Ownership_2007.pdf.

Dickerson, M. (2008, February 16). In Mexico, old U.S. cars find new homes. *Los Angeles Times*. Retrieved February 19, 2010 from <http://articles.latimes.com/2008/02/16/business/fi-mexclunkers16>.

Ellingwood, K. (2009, February 27). Mexico to send up to 5,000 more troops to Ciudad Juárez. *Los Angeles Times*. Retrieved March 10, 2010 from <http://www.latimes.com/news/nationworld/world/la-fg-juarez-troops27-2009feb27,0,2667623.story>.

Energy Information Administration (EIA). (2009). International Energy Outlook. U.S. Department of Energy. Retrieved January 15, 2010 from <http://www.eia.doe.gov/oiaf/ieo/>.

Fullerton, T., Tinajero, R., and Anda, B. A. (2006). Short-Term Water Consumption Patterns in Ciudad Juárez, Mexico. *Atlantic Economic Journal* 34 (4): 467-479.

Gould, J., and Martinez, A. (2010, March 21). Mexico's Economy May Grow 4% to 5%, Carstens Says. Bloomberg. Retrieved March 23, 2010 from <http://www.bloomberg.com/apps/news?pid=20601086&sid=amqhtExdTko>.

Grant Thornton International (2009). Mexico breaks the 'BRIC' to appear in top four emerging economies. Emerging Markets Section. Retrieved March 21, 2010 from <http://www.gti.org/Press-room/Mexico-breaks-the-BRIC.asp>.

Grillo, I. (2009, April 11). Dry Taps in Mexico City: A Water Crisis Gets Worse. *Time*. Retrieved March 25, 2010 from <http://www.time.com/time/world/article/0,8599,1890623,00.html>.

Hawley, C. (2008, February 10). In Mexico, an energized economy raises hopes. *USA Today*. Retrieved March 18, 2010 from http://www.usatoday.com/news/world/2008-02-10-Mexicorising_N.htm.

Luck, T. (2008, February 26). The World's Dirtiest Cities. *Forbes*. Retrieved February, 23 2010 from http://www.forbes.com/2008/02/26/pollution-baku-oil-biz-logistics-cx_tl_0226dirtycities.html.

Rosenberg, M. (2008, June 5). Mexico City smog hurting people's sense of smell. Planet Ark. Retrieved March 3, 2010 from <http://www.planetark.com/dailynewsstory.cfm/newsid/48638/story.htm>.

Table, A. (2008). Mexico faces collapse in oil exports. *Oil and Energy Trends* 33 (3): 3-6.

The World Bank. (2009). Key Development Data & Statistics. Retrieved March 22, 2009 from <http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/0,,contentMDK:20535285~menuPK:1192694~pagePK:64133150~piPK:64133175~theSitePK:239419,00.html>.

U.S. Environmental Protection Agency. (2009, March). Expansion of the Wastewater Collection System to Unserved Areas in the Cities of Tijuana and Playas de Rosarito, Baja California. Transboundary Environmental Assessment. Retrieved March 20, 2010 from <http://www.epa.gov/usmexicoborder/infrastructure/rosarito-plant-expansion/rosarito-ww-ea-2009.pdf>.

U.S. Department of State. (2010). Background Note: Mexico. Bureau of Western Hemisphere Affairs. Retrieved

March 1, 2010 from <http://www.state.gov/r/pa/ei/bgn/35749.htm>.

Wood, D. (2009, November 30). Cantarell, Mexico's Economy and Interdependence. Center For Strategic & International Studies. Retrieved March 14, 2010 from <http://csis.org/blog/cantarell-mexicos-economy-and-interdependence>.