

THE SILVER LINING TO A CLOUDY SITUATION: HOW MEXICO'S BUMBLING MODERNIZATION OF PEMEX IS SPURRING DEVELOPMENT OF RENEWABLE ENERGY

In December 2010, Mexico's Grupo Bimbo announced plans for a \$200 million wind farm intended to power the company's sixty-five Mexican plants and offices.¹ Bimbo is one of the world's largest breadmakers, and with an eventual capacity of 90 megawatts (MW), this wind farm project is one of the largest undertaken by a company in the food industry.² Less than two years earlier, cement giant Cemex unveiled "[a] wind farm described as the largest in Latin America,"³ the 250 MW EURUS wind farm in southern Mexico, a \$592 million venture with Spanish developer Acciona.⁴ Elsewhere in Mexico, retailers Wal-Mart de Mexico and Soriana have also launched wind farm projects.⁵

Official policy has played a limited role in this recent surge in Mexico's renewable energy production.⁶ Beneath political posturing lie two simple facts: "Mexican oil production has been on the decline in recent years, [and] the country has enormous renewable energy potential."⁷

1. *Mexico's Bimbo to Build \$200 Million Wind Farm*, REUTERS, Dec. 2, 2010.

2. *Id.*

3. *Mexican Wind Farm Gets Key Loan*, GREEN (Dec. 15, 2009, 11:55 AM) <http://green.blogs.nytimes.com/>.

4. *Juchitan de Zaragoza, Cemex Aims to Cut Energy Costs with New Wind Park*, REUTERS, Jan. 22, 2009.

5. *Mexico's Bimbo to Build \$200 Million Wind Farm*, *supra* note 1.

6. See J. Scott Childs, *Continental Cap-and-Trade: Canada, the United States, and Climate Change Partnership in North America*, 32 HOUS. J. INT'L L. 393, 446-47 (2010) (noting that "Mexican President Felipe Calderón is positioning his country as a global leader on climate change").

7. *Id.* at 447.

I. DECLINING OIL PRODUCTION

For the past decade, Mexico has relied heavily on oil extracted from the super-giant Cantarell oil field in the shallow waters of the Gulf of Mexico.⁸ More than half of the oil Mexico produced in that period came from the Cantarell field, but output there has declined sharply.⁹ A “huge number of potential reservoirs” exist in Mexico, but Pemex, the state oil company, lacks the capital and the expertise to explore these untested reservoirs.¹⁰ In addition, an intricate web of politics and constitutional restraints prohibit Pemex from partnering with private oil companies that *do* have the resources to explore its potential reservoirs, especially the vast potential reservoirs in the deepest parts of the Gulf of Mexico.¹¹ Declining oil production poses a serious threat to the Mexican government, which relies on Pemex for one-third of its revenues.¹²

II. ENORMOUS RENEWABLE ENERGY POTENTIAL

A. Wind Power

Mexico had not made significant strides toward harnessing its wind potential until relatively recently.¹³ Real progress began in 2006, when former energy secretary Felipe Calderón was inaugurated as Mexico’s president.¹⁴ As a candidate, Calderón had broken with tradition and advocated for the

8. Karla Urdaneta, *Transboundary Petroleum Reservoirs: A Recommended Approach for the United States and Mexico in the Deepwaters of the Gulf of Mexico*, 32 HOUS. J. INT’L L. 333, 337 (2010).

9. *Id.*

10. *Id.* at 358–59.

11. This topic discussed in depth in Miriam Grunstein’s article in this edition of the Houston Journal of International Law. See generally Miriam Grunstein, *Unitized we Stand, Divided we Fall: A Mexican Response to Karla Urdaneta’s Analysis of Transboundary Petroleum Reservoirs in the Deep Waters of the Gulf of Mexico*, 33 HOUS. J. INT’L L. 369 (2011).

12. Duncan Wood, *The Administration of Decline: Mexico’s Looming Oil Crisis*, 16 L. & BUS. REV. AM. 855, 858 (2010).

13. Chris Hawley, *Clean Energy a ‘Dirty Business’ in Mexico*, USA TODAY, June 17, 2009, at 1B.

14. *Id.*

opening up of Mexico's energy sector to private investment.¹⁵ Political infighting has prevented any significant opening up,¹⁶ and plummeting oil production—it fell by 9.2% in 2008 alone—has forced Calderón to seek out alternative energy sources.¹⁷ Wind has been especially promising, and Calderón has ambitiously pledged to increase Mexico's wind energy capacity to 2500 MW—enough to power 700,000 U.S. homes—by the end of his term in 2012.¹⁸

Mexico's Isthmus of Tehuantepec “is becoming the Saudi Arabia of alternative energy.”¹⁹ The isthmus is ideally placed “at the bottom of a funnel formed by two mountain ranges,” and “[w]ind from the Atlantic Ocean and the Gulf of Mexico whistles through this pass on its way to the Pacific Ocean.”²⁰ Winds there consistently blow at rates of 15–22 mph—perfect speeds for wind turbines.²¹ Further east, the Yucatán Peninsula has been touted as “one of the most promising areas for wind energy development within the Latin American region.”²²

Mexico's unique geography makes the development of wind power more economically feasible in Mexico than it is in many other countries.²³ Investors there can get a return on their investments without the lavish government subsidies necessary in the United States, Canada, and the European Union.²⁴ This is

15. Jenalia Moreno, *Energy Emerges as an Issue for Mexican Candidates*, HOUS. CHRON., May 13, 2006, at 1.

16. Wood, *supra* note 12, at 855 (noting the “ultimately gridlocked negotiations”).

17. Mark Stevenson, *Mexico Turns to Wind for Alternative Energy; Country Asks Spanish Company to Run Project*, HOUS. CHRON., Jan. 23, 2009, at 14.

18. Hawley, *supra* note 13; *see* Stevenson, *supra* note 17.

19. Hawley, *supra* note 13.

20. *Id.*

21. Stevenson, *supra* note 17.

22. Rolando Soler-Bientz, Simon Watson & David Infield, *Preliminary Studies of Long-term Wind Characteristics of the Mexican Yucatán Peninsula*, 50 ENERGY CONVERSION & MGMT. 1773, 1773 (2009).

23. *See* Rowena Mason, *Wind-powered Stations to Reach Profitability by 2017*, DAILY TELEGRAPH (London), Sept. 20, 2009, <http://www.telegraph.co.uk/finance/newsbysector/energy/6211827/Wind-powered-stations-to-reach-profitability-by-2017.html>.

24. *See id.*; *see also* Michael Streich, Comment, *Green Energy and Economy Act, 2009: A “FIT”-ing Policy for North America?*, 33 HOUS. J. INT'L L. 419, 428–31 (2011) (describing the history of feed-in tariffs, one type of government subsidy for renewable

fortunate; the Mexican government can hardly afford to subsidize renewable energy.²⁵ It already spends \$19.2 million to keep gasoline prices artificially low.²⁶ The international community is not so strapped for cash, however. Mexico is one of a handful of developing countries benefitting under the U.N. Clean Development Mechanism program.²⁷ The program has funded sixteen wind power projects in Mexico with an eventual capacity of 1964 MW.²⁸ Only China and India have received more international assistance toward the development of wind power.²⁹

B. Solar Power

Not only is Mexico lucky enough to have “world-class” winds, but it also has incredible potential for solar power.³⁰ By 1995, Northern Mexico was recognized as a “promising location[]” for integrated solar combined cycle systems (ISCCS), then seen as the only renewable energy projects “able to compete with large scale fossil-fueled power plants.”³¹ At that time, a \$244 million, 341,000 square-meter ISCCS provided 312 MW of electricity to the area.³² Generally, though, start-up costs for solar

energy); Martin Lythgoe, *Renewable Generation in Argentina: Past Failures and a Plan for Future Access*, 31 HOUS. J. INT'L L. 263, 320–23 (2009) (comparing the subsidy schemes used in the United Kingdom and Germany).

25. *Mexico Aims for More Gas-fired Generation, Renewables*, WORLD GAS INTELLIGENCE, June 3, 2008.

26. *Id.*

27. Keith Bradsher, *Knowing Which Way the Wind Blows; Handful of Nations Get Most Subsidies*, INT'L HERALD TRIBUNE, May 9, 2007, at 1 (noting that Argentina, Brazil, China, and India receive most of

28. STEVE SAWYER, GLOBAL WIND POWER 24 (2010), http://unfccc.int/files/meetings/sb32/media/application/pdf/wind_energy_in_dev_countries.pdf.

29. *Id.*

30. *Mexico Aims for More Gas-Fired Generation*, *supra* note 25; see Oso Oseguera, *Sunny Mexico: An Energy Opportunity*, GREENTECH SOLAR, July 7, 2010, <http://www.greentechmedia.com/articles/read/sunny-mexico-an-energy-opportunity> (“Mexico’s solar resources are among the best in the world, far superior to those of Germany and Spain, the countries currently recognized as the world leaders in installed photovoltaic systems.”).

31. PILKINGTON SOLAR INTERNATIONAL GMBH, STATUS REPORT ON SOLAR TROUGH POWER PLANTS 2–5 (1996) <http://www.solarpaces.org/Library/docs/PiStaRep.pdf>.

32. *Id.* at A-7.

photovoltaic (PV) projects have been prohibitive in Mexico despite ideal local environmental conditions.³³ That looks likely to change in the near future.³⁴ The Mexican government predicts that solar power will soon be able to compete with government-subsidized fossil fuels.³⁵ Any decrease in oil subsidies would obviously make solar power more competitive, and the Mexican government is already exploring ways to redirect those subsidies to promote the growth of solar power.³⁶

After being “quasi[-]stagnant” for several years, Mexico’s solar market began to grow again in 2009.³⁷ Since then, the market has grown so quickly that there is a thriving black market for solar panels along the U.S.-Mexico border.³⁸ In 2009, the government of Durango, a state in northern Mexico, began an ambitious plan to harness its solar potential of 6.3 kilowatt-hours (KWh) per square meter.³⁹ The first phase called for 210 hectares (about 519 acres) of solar panels.⁴⁰ In August 2010,

33. SAWYER, *supra* note 28, at 24; *see also* COMISIÓN NACIONAL PARA EL USO EFICIENTE DE LA ENERGÍA [NAT’L COMM’N FOR EFFICIENT ENERGY USAGE], NICHOS DE MERCADO PARA SISTEMAS FOTOVOLTAICOS EN CONEXIÓN A LA RED ELÉCTRICA EN MÉXICO [MARKET NICHEs FOR GRID-CONNECTED PHOTOVOLTAIC SYSTEMS IN MEXICO] 11 (2009) <http://www.conae.gob.mx/work/sites/CONAE/resources/LocalContent/7157/1/NichosMercSF2009GTZ.pdf> [hereinafter MARKET NICHEs] (“[D]espite . . . excellent conditions for photovoltaic systems in Mexico[,] there are hardly any opportunities at current PV prices for cost-saving applications in the residential[,] industry[,] or services sectors.”).

34. MARKET NICHEs, *supra* note 33, at 11.

35. *Id.*; *see supra* note 26 and accompanying text (describing the price subsidies Mexico uses to keep gasoline prices low).

36. MARKET NICHEs, *supra* note 33, at 11.

37. INT’L ENERGY AGENCY, PHOTOVOLTAIC POWER SYSTEMS PROGRAMME, ANNUAL REPORT 91 (2009) http://www.iea-pvps.org/index.php?id=6&eID=dam_frontend_push&docID=30. German developer Q-Cells announced plans to invest up to \$3.5 billion to produce PV equipment in Mexicali, but the company eventually reduced its investment because of global economic conditions. Press Release, Q-Cells, Q-Cells AG to Invest in Mexico (May 27, 2008) http://www.q-cells.de/medien/kommunikation/presse/pressemeldungen/downloads_eng/pi_mexiko_260508_e.pdf; *see* José Eseverri, *Prepara Durango Cluster Solar [Durango Prepares Solar Cluster]*, REFORMA (Mex.), Nov. 11, 2009, at 1.

38. Stephanie Simon, *Stop that (Solar) Thief! As More Solar Panels are Stolen, Companies Find New Ways to Protect Them*, WALL ST. J., Oct. 19, 2009, at R.6.

39. Eseverri, *supra* note 37.

40. *Id.*

twenty-three kilometers of Mexico's Viaducto Bicentenario elevated superhighway were lighted entirely with solar power unconnected to the electrical grid.⁴¹

III. WITH OR WITHOUT PEMEX REFORM

Much has been made of Mexico's efforts to inject private capital and expertise into Pemex.⁴² Likewise, much has been made of the absolute failure of these efforts.⁴³ The result is a stagnation of Mexico's oil industry and an inability to exploit the potentially vast oil reserves in the deep waters of the Gulf of Mexico.⁴⁴ Fortunately, renewable energy in Mexico does not face the same obstacles to private investment, and Mexico's wind and solar potential can be exploited relatively easily.⁴⁵ President Calderón has made it clear that Mexico's energy industry will continue to grow—with or without Pemex reform: "With nothing but wind power, without burning a drop of petroleum, we are generating electricity so people can live better, so companies can produce more and generate more jobs, and so that people here can benefit through rent or association with these projects."⁴⁶

*Zachary J. Lee**

41. Press Release, Lighting Science Group, No Electric Grid Needed—Lighting Science Group Couples LED Lighting With Solar Technology to Produce One of the Most Energy Efficient Street Lights on the Planet (Aug. 19, 2010) <http://investor.lsgc.com/releasedetail.cfm?ReleaseID=500588>.

42. See generally Jonathan Howell, Comment & Casenote, *Privatization of Pemex*, 13 L. & BUS. REV. AM. 461 (2007).

43. *Id.* at 467 ("Despite Mexico's adoption and implementation of free market reforms throughout most of its economy, Pemex has been trapped in a political whirlwind and remains outside of the privatization process."); see Urdaneta, *supra* note 8, at 352 ("The last legislative reform does not endow Pemex with the capital and technology necessary to undertake the activities of exploration and production of deep-waters in the [Gulf of Mexico].").

44. Urdaneta, *supra* note 8, at 352; see Howell, *supra* note 42, at 602–03 ("Critics of the reform argue that as long as PEMEX continues to be treated as the primary source of money for the country and not as a real company, Mexico will continue to be sacrificing its foremost source of wealth.").

45. See Hawley, *supra* note 13.

46. *Id.*

* Zachary J. Lee is the Executive Editor of the Houston Journal of International Law.