

INCENTIVES FOR ELECTRIC GENERATION INFRASTRUCTURE DEVELOPMENT

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I.	INTRODUCTION	373
II.	RESTRUCTURING OF THE POWER INDUSTRY.....	374
III.	OBSTACLES TO INCREASED CAPACITY.....	377
	A. Uncertainty in a Competitive Market	377
	B. Environmental Policies	378
	C. Local Citizen Opposition.....	379
	D. Stranded Costs	380
	E. Delay	381
	F. Liability.....	382
IV.	INCENTIVES FOR DEVELOPMENT.....	382
	A. General Independent System Operator Incentives.....	383
	B. Nuclear Power Incentives.....	386
	C. Clean Coal Power Incentives	388
	D. Incentives for Wind Power and Other Renewables	390
V.	CONCLUSION	392

I. INTRODUCTION

Until the 1990's the nation's electricity market functioned as a natural monopoly. Utilities existed to serve customers in their exclusive territories, which were set up and controlled by the states. Federal acts at the close of the twentieth century opened the door for restructuring, leading several states to begin the breakdown of this last monopoly. The thought behind restructuring was that competition between utilities would work to keep electricity rates low for customers and would help to fuel the construction of new infrastructure thus keeping supplies of electricity plentiful. Restructuring has failed to spur infrastructure development, in both power generation and electricity transmission,

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largely because of outside factors that affect the industry. Because of the lack of development, the United States faces possible electricity delivery issues in the coming decades. The federal government, local governments, and regional transmission operators throughout the country have begun creating incentives for development of infrastructure so that electric service will continue to meet the demands of future power consumption.

After a brief discussion of the events leading up to the restructuring of the electricity markets in the United States (sometimes referred to as deregulation) in Part II, this paper will discuss several reasons for the lack of new generation development, including the uncertainty of profitability in deregulated markets, liability issues, environmental regulations, citizen opposition to local development (NIMBY), government bureaucracy, capital costs, and other obstacles in Part III. Recent incentive programs for increased generation will be discussed in Part IV, including what several ISO's are doing to spur development, the streamlining of the siting process for nuclear power plants, development of clean coal plants, and incentives for investment in renewable power sources such as wind.

II. RESTRUCTURING OF THE POWER INDUSTRY

Throughout much of the history of electric power in the United States, utility companies acted as exclusive monopolies.¹ These monopolies served exclusive territories and were regulated by the state's Public Utility Commission (PUC).² The utilities were vertically integrated, meaning that one company handled all aspects of the electricity for that market—generation, transmission, and distribution.³ In 1935, the Federal Power Act (FPA)⁴ gave the federal government the task of regulating wholesale electricity costs and the transmission of electricity across state lines under the interstate commerce clause of the constitution.⁵ Wholesale costs describe costs charged for electricity other than retail sales to end customers, which are regulated by the states.⁶ The FPA gave the previously established Federal Power Commission, now the Federal Energy Regulatory Commission (FERC), authority over electricity.⁷

1. Joel B. Eisen, *Regulatory Linearity, Commerce Clause Brinkmanship, and Retrenchment in Electric Utility Deregulation*, 40 WAKE FOREST L. REV. 545, 548 (2005).

2. *Id.*

3. *Id.*

4. Federal Power Act, Pub. L. 66-280, 41 Stat. 1063 (codified as amended in scattered sections of 16 U.S.C.).

5. 16 U.S.C. § 824(a) (2006).

6. Eisen, *supra* note 1, at 549.

7. TIMOTHY J. BRENNAN, KAREN L. PALMER & SALVADOR A. MARTINEZ, *ALTERNATING CURRENTS: ELECTRICITY MARKETS AND PUBLIC POLICY*, 27 (2002).

In the last quarter of the twentieth century, a shift began that would eventually lead to breaking up the last monopoly—the electric industry. First, the Public Utilities Regulatory Policies Act of 1978⁸ created a market for generation by forcing utilities to look to small power producers and cogeneration plants to fulfill necessary power demand.⁹ That market grew with the Energy Policy Act of 1992,¹⁰ which forced transmission owners to wheel electricity for third parties across the electricity grid.¹¹

FERC responded to these developments by promoting competition through several different orders. In Order No. 888,¹² FERC required utility owners to open access to their transmission lines by forcing them to file “open-access, nondiscriminatory transmission tariffs that contain minimum terms and conditions for nondiscriminatory service, take transmission service for their own wholesale sales and purchases of electric energy under the open-access tariffs,” and give other transmission users access to the same information that they used.¹³ The order also called for the creation of the Independent System Operator (ISO), which would function as an entity in control of the transmission lines—taking the decisions about who had access to the grid away from the utilities that owned them.¹⁴ FERC also forced power companies to separate their business functions for generation, transmission, and ancillary services, referred to as “functional unbundling” of the wholesale pricing.¹⁵

Order No. 2000¹⁶ listed the minimal requirements and functions of a Regional Transmission Organization (RTO), which could be an ISO or stand-alone transmission company (transco).¹⁷ It urged utilities to form RTO’s as soon as possible, as it was FERC’s view that the traditional vertically integrated utility could not manage the grid in a fair and independent way and would be inadequate for the further development of a competitive electricity market.¹⁸ But since the order did not force utilities to use the regional ISO system, several areas of the country did, while others continued to function in the traditional vertically integrated

8. Public Utilities Regulatory Policies Act of 1978, Pub. L. 95-617, 92 Stat. 3117 (codified as amended in scattered sections of 7, 15, 16, 42, and 43 U.S.C.).

9. 16 U.S.C. § 824a-3 (2006).

10. Energy Policy Act of 1992, Pub. L. 102-486, 106 Stat. 2776 (codified as amended in scattered sections of 16 and 42 U.S.C.).

11. 16 U.S.C. § 824j (2006).

12. FERC Order No. 888, 61 Fed. Reg. 21, 540-01 (May 10, 1996) (codified at 18 C.F.R. pts. 35, 385).

13. Eisen, *supra* note 1, at 550.

14. *Id.* at 551.

15. BRENNAN, PALMER & MARTINEZ, *supra* note 7, at 29.

16. FERC Order No. 2000, 65 Fed. Reg. 809 (January 6, 2000) (codified at 18 C.F.R. pt. 35).

17. BRENNAN, PALMER & MARTINEZ, *supra* note 7, at 79.

18. Eisen, *supra* note 1, at 552.

manner.¹⁹ After a strong reaction against a proposed rule to fill in the gaps left by Order No. 2000, FERC released a White Paper explaining that eventually all utilities would have to join a regional transmission operator, though no such final directive has been made.²⁰

Currently, the nation's electricity markets are in an in-between state. Some areas of the country, like New England and the Mid-Atlantic region, have actively developed restructuring plans in place.²¹ Other areas of the country, such as the Pacific Northwest, have yet to fall away from the traditional vertically integrated utility.²² California's restructuring plans were suspended after the well-documented crisis stemming from problems with its reliance on spot markets and market share issues with companies such as Enron several years ago.²³ While important on the timeline of restructuring in the United States, those events have been often discussed, and this paper will not examine them in depth.²⁴

While transmission (the delivery of electricity over long distances) and distribution (local delivery of electricity) continue to be viewed as natural monopolies and will eventually all be handled on at least a regional level, generation is no longer seen that way.²⁵ Due to advances in ultra high-voltage transmission lines that can transport electricity over long distances and cheaper, more efficient gas turbines, generators from across the country can now compete with each other in a deregulated market to sell electricity at the wholesale level.²⁶ The United States currently has three major electric grids, each of which can handle this generational competition.²⁷ The price of electricity on one end of a grid affects the price on the other end and is not limited to state or even, in the case of Canada, national borders.²⁸

The natural thought is that allowing such a competitive market for electric generation will open the doors for power generators large and small to build and improve the nation's generational capacity. Since the electric markets do not exist in a vacuum, several factors have impeded

19. *Id.*

20. *Id.* at 554.

21. BRENNAN, PALMER & MARTINEZ, *supra* note 7, at 39 fig.4-1.

22. *Id.*

23. *Id.* at 46.

24. *Id.*

25. Richard J. Pierce, Jr., *Completing the Process of Restructuring the Electricity Market*, 40 WAKE FOREST L. REV. 451, 461 (2005). *See also* BRENNAN, PALMER & MARTINEZ, *supra* note 7, at 66. Since companies that control the distribution systems have already invested in the extensive networks for distribution, "no firm is likely to compete against an established distribution system." There would be huge cost involved, and there is no need for overlapping electricity grids. Due to the inability to control the flow of electricity, there is also a natural monopoly in transmitting electricity over long distances.

26. Pierce, *supra* note 25, at 462.

27. *Id.*

28. *Id.*

the development of new power plants. Several of these factors are discussed below in Part III.

III. OBSTACLES TO INCREASED CAPACITY

In the newly restructured electric market, generational capacity is ideally ensured by the competitive marketplace.²⁹ More demand should lead to more investment in generation infrastructure by power companies. While new power plants have continuously been constructed during restructuring, there is still fear that increased demand will leave a shortage of power in several areas of the country. California experienced rolling blackouts during its power crisis in 2001, and New England may face the same in the near future.³⁰ Simple economic uncertainty can hinder the development of new generation capacity. Obstacles to new power plant construction also include external factors that affect the industry, such as large capital costs, large liabilities, environmental policies, government bureaucracy, and opposition from local citizens who do not want power plants built in their areas.

A. Uncertainty in a Competitive Market

Utility companies will construct new power plants only if they can be reasonably certain that they will profit from the new generation. Coal and gas-fired power plants are a significant capital expenditure, costing in the range of one billion dollars to construct a plant that will provide about 1,000 megawatts.³¹ One megawatt will supply enough electricity to power about one thousand homes.³² Opening the electricity market to competition significantly affects the certainty of profiting from the revenues of a new plant. Because prices in several regions now fluctuate due to market demand, it is more difficult to predict future profits. In the time it takes to build a coal or gas-fired power plant, competitive forces may move prices to where it is no longer profitable to complete the project. Construction of a coal-fired plant can take between six and ten years.³³ Gas-fired plants, which can be constructed in a shorter time, are subject to the high costs and volatile price fluctuation of natural gas.³⁴

29. BRENNAN, PALMER & MARTINEZ, *supra* note 7, at 123.

30. Lisa Woods, *Regulator Warns of California Style Power Crisis in New England*, US POWER, May 1, 2006, at 17.

31. See, e.g., Judy Newman, *Wisconsin Energy Wins Approval for Coal-Fired Plants near Milwaukee*, THE WIS. ST. J., October 29, 2003, at E1.

32. Rosalie Rayburn, *Electric Cooperatives to Raise Rates in New Mexico*, ALBUQUERQUE J., September 18, 2002, at B4.

33. Douglas Stratford, *Measuring Gains from Regional Dispatch: Coal-fired Power Plant Utilization and Market Reform*, ENERGY J., January 1, 2006, at 119.

34. Steve Blankinship, *Burn, Baby, Burn: Gas Volatility Drives Renewed Interest in Coal*, POWER ENGINEERING, June 1, 2004, at 44.

Coal, on the other hand, is a stable and cheaper power source.³⁵ Fuel costs for gas-fired plants can be as high as four cents per kWh, while coal costs about one cent per kWh.³⁶ The threat of the state PUC placing a cap on retail rates that can be charged further complicates this issue. If retail rates are capped, there is the looming threat that the wholesale power purchaser will not be able to fully repay the generator, since the purchaser will not be able to recoup all of its costs through retail sales. Because of the length of time necessary to bring a new power plant online, the uncertainty of profitability in the newly competitive market impedes new construction in a way that did not exist in recent decades.

B. Environmental Policies

Traditional electricity generation has been through coal-fired plants. Plants burning coal to produce electricity give off many pollutants, including fine dust, mercury, sulfur dioxide, and nitrogen oxides.³⁷ These plants also give off carbon dioxide, which, though arguably not a pollutant, is widely believed to contribute to global warming.³⁸ In order to combat the release of these substances into the atmosphere, Congress passed the Clean Air Act³⁹ in 1970.⁴⁰ The act required that new coal-fired plants meet stringent new standards to combat pollution, but this “new source review” did not invoke the same requirements on already existing power plants.⁴¹ While later amendments to the Clean Air Act to curtail acid rain imposed new standards on existing plants to control sulfur dioxide, the less efficient “grandfathered” coal-fired plants continue to generate power in several regions of the country, primarily the Midwest.⁴²

The past 35 years have seen continued conflict regarding the regulation of the old plants. While there are remedies for those subjected to the pollution, including citizen suits and the ability of downwind states to petition the Environmental Protection Agency (EPA) under section 126 of the Act, these remedies are limited.⁴³ The EPA refused to subject these plants to any of the new source review provisions until the Clinton administration, and that course has been reversed since George W. Bush took office.⁴⁴ The EPA continues to refuse to use its authority to regulate

35. *Id.*

36. *Id.*

37. David B. Spence, *Coal-Fired Power in a Restructured Electricity Market*, 15 DUKE ENVTL. L. & POL'Y F. 187, 188 (2005).

38. *Id.*

39. Clean Air Amendments of 1970, Pub. L. No. 91-604, 84 Stat. 1676 (codified as amended in scattered sections of 42 U.S.C.).

40. Spence, *supra* note 37, at 189.

41. *Id.* at 193.

42. *Id.* at 195.

43. *Id.* at 196.

44. *Id.* at 204–06.

carbon dioxide and mercury emissions.⁴⁵ The lack of enforcement on these existing plants may be holding up improvement of the electric generating infrastructure in the Midwest and other areas. Construction of new, more efficient plants or improvements to old plants will result from enforced regulation of the old plants.

C. Local Citizen Opposition

Once a power company decides to build a new generating plant, a location for the plant must be chosen. This leads to another impediment to development—opposition from residents in the area chosen to host the plant. “Not in my backyard,” or NIMBY, has been used to describe organized public opposition to the development of a locally undesirable project, even though that project has a more widespread positive need.⁴⁶ While NIMBY has traditionally been looked upon as nothing more than a nuisance, more recently it has led to delays and termination of several projects, both in energy and in other areas such as waste facilities.⁴⁷ Some scholars have even suggested that it has become so much of an issue that it should be renamed BANANA, or “build absolutely nothing anywhere near anything.”⁴⁸

Alternative energy projects are just as likely as traditional coal-fired and gas-fired plants to be subjected to NIMBY opposition from local residents. One such project that has been delayed for an extended period is the Cape Wind project off the coast of Massachusetts.⁴⁹ The project, to build a wind farm that would add an important increase in power to the New England area, has been the subject of many public meetings, spurred several lawsuits, and led to legislative alternatives that continue to impact the development process.⁵⁰ Those in opposition to the development cite “negative visual and aesthetic impacts” and allege that birds will be at risk due to the wind turbines.⁵¹ The opponents to the project have attempted to block the permitting for the project on several grounds.⁵² Attempts have been made to block the construction of a wind monitoring tower—the first step in assessing an area for a wind farm—through

45. *Id.* at 198. See generally *Massachusetts v. EPA*, 415 F.3d 50 (D.C. Cir. 2005).

46. Barak D. Richman & Christopher Boerner, *A Transaction Cost Economizing Approach to Regulation: Understanding the NIMBY Problem and Improving Regulatory Responses*, 23 *YALE J. ON REG.* 29, 31–32 (2006).

47. *Id.* at 32.

48. *Id.*

49. Carolyn S. Kaplan, *Congress, the Courts, and the Army Corps: Siting the First Offshore Wind Farm in the United States*, 31 *B.C. ENVTL. AFF. L. REV.* 177, 193 (2004).

50. *Id.* at 193–94.

51. *Id.* at 203.

52. Ernest Smith, Rex G. Baker Centennial Chair in Natural Resources Law, The Univ. of Tex. at Austin, Address at the Texas Journal of Oil, Gas, and Energy Law Symposium: Recent Legal Developments in Wind Energy (Feb. 15, 2007).

questioning the federal government's jurisdiction over the area using both the rules governing the outer continental shelf and the Magnuson-Stevens Act, which gives Massachusetts jurisdiction over all fishing in the bay.⁵³ Opponents have also tried to stop the permitting of the transmission lines that will run below the sea from the wind farm to the power grid on shore.⁵⁴ So far, Cape Wind has been victorious in all hearings on all levels, but the opponents of the project have succeeded in causing delays and expense for the wind farm.⁵⁵

Methods other than injunctions to prevent permitting have been employed in attempts to stop the development of wind farms and other power production. Nuisance lawsuits have been used in attempts to shut down existing wind turbines, but have thus far been unsuccessful.⁵⁶ Political action at the local level has been used in some cities and counties in order to ban development or make the permitting so difficult that the legislation effectively bans development.⁵⁷

Efforts need to be made in this area to streamline the development and permitting process, as well as to fix a finite timetable for public hearings. Developers and politicians need to cite the greater good that will come of these projects, since those who will reap those benefits are from a much wider area and are not adversely affected by the project like those who are forwarding the NIMBY movement.⁵⁸

D. Stranded Costs

Electricity infrastructure projects like power plants are large capital expenditures costing hundreds of millions of dollars. When the industry was regulated, power companies were able to recover the costs of their investments in new construction⁵⁹ by simply passing the costs on to the customers in the form of rate increases.⁶⁰ With the restructuring of the electric industry, some portion of these costs may no longer be recovered by the power companies. This unrecoverable portion of funds is referred to as "stranded costs." Though these costs are likely to eventually be recovered, uncertainty about these expenditures poses a threat to the construction of more power plants as more markets restructure.⁶¹

53. *Id.*

54. *Id.*

55. *Id.*

56. *Id.*

57. *Id.*

58. See Richman & Boerner, *supra* note 46, at 38.

59. Seth Gillen, *Great Expectations: Stranded Cost Recovery and the Interplay of the Electricity Industry, Consumers, and the Public Utility Commission of Texas*, 7 TEX. TECH J. TEX. ADMIN. L. 345, 348 (2006).

60. *Id.* at 348.

61. *Id.* at 350.

States have different rules regarding stranded costs, but much of the issue regarding their recovery stems from the fact that once the market is deregulated into a competitive environment, attempting to recover all of the capital expenditures will make prices uncompetitive.⁶² Power companies that lose their monopoly will also suffer from the loss of customers to new, cheaper competitors.⁶³ This leads to an immediate drop in the rates collected each month.⁶⁴ Utility companies who had invested in infrastructure prior to restructuring have looked to state governments to find a way to reimburse these costs, arguing that they are working to provide a public good.⁶⁵ Opponents argue that it is unfair to charge customers for these developments, especially those that may not have been prudent in the competitive environment.⁶⁶ While Texas and other states have granted utilities recovery of stranded costs,⁶⁷ there is no guarantee that other states will follow their lead as they deregulate, which can deter utilities from sinking capital into new infrastructure.

Areas of the country that have not yet restructured their electric markets may be affected by the uncertainty of stranded cost recovery. Utilities will be hesitant to sink substantial capital into new facilities with the possibility of restructuring on the horizon. As more regions of the country restructure their electric markets, more stranded cost issues will arise across the country. This may be a finite problem if deregulation takes hold and stabilizes over several years. The obstacle of stranded cost uncertainty will be resolved on a state-by-state basis.

E. Delay

Another hurdle that must be overcome is the threat of delay, in both the construction phase and the operation phase. Many projects are delayed by government bureaucracy, in the form of testing and licensing, and citizen opposition—lawsuits and public meetings. These delays in projects are not free for the power companies developing the projects. There are added costs in construction loans, land costs, and lack of incoming payments from customers during these periods of delay. These costs can make power projects unprofitable and make their successful completion less than guaranteed. Delays act as an obstacle to development of new infrastructure, but they can be overcome by streamlining the approval process for power plants. Through setting and

62. *Id.*

63. BRENNAN, PALMER & MARTINES, *supra* note 7, at 150.

64. *Id.*

65. Gillen, *supra* note 59, at 349.

66. *Id.*

67. *Id.* at 350.

adhering to schedules and deadlines for siting and permitting, governments will be able to minimize the delay.

F. Liability

Continued liability through operation can also act as an impediment to new plant construction. While this is a problem for all power generators, it especially affects the realm of nuclear power. Nuclear accidents, while catastrophic, are very rare.⁶⁸ Most nuclear fears are unfounded, as accidents at nuclear plants have directly led to the deaths of only thirty-one individuals, all at the Chernobyl plant in the Soviet Union in 1986.⁶⁹ However, if an actual event occurred within the United States, the liability for the power company would be incalculable. Because of this, a company may be hesitant to take on the risk of constructing a facility without some sort of government support. Shifting some of the risk away from the utility companies would have a beneficial impact on the development of new infrastructure. Solutions to both delay and liability in nuclear plant construction are discussed in Part IV.

IV. INCENTIVES FOR DEVELOPMENT

Government incentives may be the answer to overcoming the obstacles that limit new infrastructure development. Because the competitive electricity market does not exist within a bubble, unaffected by other factors, governments and regional entities have stepped in to ensure that there will be a secure supply of energy in the future. Many of these incentives are part of the Energy Policy Act of 2005⁷⁰ (EPAct), passed in Congress and signed into law by President Bush later that year. Included are incentives to spur the development of nuclear power plants, so-called clean coal power plants, and other renewable power sources, such as wind turbine power. FERC recently approved a new plan in New England that allows power companies in the region to presently charge customers increased rates in order to meet future power demands.⁷¹ Regional ISO's are also attempting to spur development in other ways. Table 1, below, outlines several incentives that are discussed throughout Part IV.

68. Neal H. Lewis, *Interpreting the Oracle: License Modifications, Economics, Safety, Politics, and the Future of Nuclear Power in the United States*, 16 ALB. L.J. SCI. & TECH. 27, 48 (2006).

69. *Id.* at 52.

70. Energy Policy Act of 2005, Pub. L. No. 109-58, 119 Stat. 594 (codified as amended in scattered sections of 42 U.S.C.).

71. Patricia Daddona, *Regulators Approve Regional Energy Plan*, DAY (New London, Conn.), June 16, 2006.

Table 1. Incentives

CATEGORY	INCENTIVE	REFERENCE
General ISO Incentives	Market Reliance ⁷²	Cal-ISO, MISO
	Forward Capacity Market	ISO New England
Nuclear Power	No-fault Insurance	42 U.S.C. § 2210
	Standby Support	42 U.S.C. § 16014
	Loan Guarantees	42 U.S.C. § 16513
	Tax Credit	26 U.S.C. § 45J
Clean Coal Power	Loan Guarantees	42 U.S.C. § 16513
	FutureGen Project	71 Fed. Reg. 8,283
	Investment Tax Credit	26 U.S.C. § 48A
Wind Power	Loan Guarantees	42 U.S.C. § 16513
	Tax Credit	26 U.S.C. § 168

A. General Independent System Operator Incentives

Independent System Operators have gone in two divergent directions in order to spur development. Several ISO's continue to rely on competitive market forces to prompt the development of new power plants. They have done this by raising their price caps—the regulations governing the maximum wholesale prices that can be charged by power generators. Raising the cap on wholesale pricing allows markets more fluctuation and promotes the use of long-term contracts for electricity purchases.⁷³ These contracts can help to allow power companies to be more certain of potential profits from future infrastructure investment, which leads to more development.⁷⁴ Most ISO's in the U.S. are capped at \$1,000/MWh.⁷⁵ Recently, FERC conditionally approved the California Independent System Operator's (Cal-ISO) proposal to reform its

72. The term "Market Reliance" is used to describe several ISO's that are loosening regulatory constraints in an effort to promote increased generation infrastructure by relying on market factors.

73. Jim Foster & Mike Wilczek, *Seeking Support for a Different Way to Build Capacity, MISO Tries Politically Tricky Route*, POWER MARKETS WK., September 19, 2005, at 1.

74. *Id.*

75. *Id.*

electricity markets by implementing a market redesign and technology upgrade (MRTU).⁷⁶ As part of the proposal, Cal-ISO will begin increasing its cap from \$400/MWh to \$1,000/MWh over the next two years.⁷⁷

The Midwest Independent Transmission System Operator (MISO) is proposing a more radical idea. MISO's price cap is currently at \$1,000/MWh, but there is talk that the regional operator is looking to raise the limit to \$5,000/MWh.⁷⁸ The manager of market development cited Australia's success with a cap of Australia \$10,000/MWh (about \$7,700 in U.S. dollars) and explained that price spikes should be allowed to happen.⁷⁹ Price spikes in 1998 and 1999 are often credited for the present surplus of generating capacity in the region.⁸⁰ While this approach may work, regulators need to be careful to avoid the market power and manipulation issues that led to the problems in California.

In several restructured regions, reliance on market forces has not led to increased capacity. These areas, like New England, have resorted to using more regulation to create the incentive to build new power plants. Over the past few years, the six New England states that constitute ISO New England—Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont—have come dangerously close to having less electricity than the states demand.⁸¹ Currently, the states have a summer peak of about 27,000 megawatts and the capacity is 32,000 megawatts.⁸² As the demand for energy in the area increases, the region may approach a power crisis much like that in California several years ago.⁸³ Virtually no new power plants have been put online in the area since 2002.⁸⁴ Much of the lack of increased capacity comes from the NIMBY sentiment among the area's citizens.⁸⁵

In order to combat this emerging problem, New England's transmission operator, ISO New England, has advanced several plans to encourage local power providers to increase the region's capacity. The first plan, called Locational Installed Capacity (LICAP) was unsuccessful because it would have meant exponential increases in the already high-priced electricity markets of Connecticut and Boston.⁸⁶ A second plan,

76. *FERC Conditionally Approves Cal-ISO's Market Redesign Proposal*, FOSTER ELECTRIC REP., Sept. 26, 2006, at 1.

77. *Id.*

78. Foster & Wilczek, *supra* note 73, at 1.

79. *Id.*

80. *Id.*

81. Woods, *supra* note 30, at 17.

82. *Id.*

83. *Id.*

84. Peter J. Howe, *Flurry of Power Plant Proposals Offers Hope*, BOSTON GLOBE, September 25, 2006, at B1.

85. Woods, *supra* note 30, at 17.

86. *Id.*

the forward capacity market, was advanced early in 2006 and approved by FERC that summer.⁸⁷

Under the forward capacity market plan, ISO New England will be able to hold annual auctions beginning in 2009 allowing power generators to bid for supply contracts with rate pricing that will guarantee a sufficient power supply for consumers and allow power companies to stay in business.⁸⁸ In the meantime, customers in the region that have been paying artificially low electric rates for several years will make “transitional payments” to power companies from 2007 through 2010.⁸⁹ The rates have been artificially low because FERC has limited the amount that the cost of power in the region can increase in a single day, due to extreme fluctuations in the spot market prices over the past few years.⁹⁰ Transitional payments are estimated to be in the two to three percent range per month, which is about half of what the LICAP plan called for.⁹¹ The payments can be used by the power companies to build new plants in the region, but that use is not mandated.⁹²

While the plan may go on to fix the region’s power shortfall and prevent rolling blackouts similar to those seen in California, it was not without opposition. The Maine Public Utilities Commission had opposed the plan during the time leading up to FERC approval because Maine, unlike the other five states under ISO New England control, currently has a surplus of power.⁹³ Because Maine’s effort to restructure its electricity market has been overwhelmingly successful, competition has led to lower rates for its customers, who will now be more adversely affected by the transitional payments than the citizens of the rest of New England.⁹⁴ The Maine PUC has gone so far as to threaten leaving the ISO entirely, by either setting up its own transmission grid or merging with the Canadian Maritime grid.⁹⁵ At any rate, the new policy seems to have had a positive effect on the rest of the region. From February through September of 2006, proposals for twenty-one new power plants have been submitted to the ISO, including proposals for less traditional plants such as wind and methane facilities.⁹⁶

It appears that the successes in Maine, the Midwest, and Australia can be seen as reasons for allowing the newly established electricity markets to run their course and work things out. Less government regulation can

87. Daddona, *supra* note 71.

88. *Id.*

89. *Id.*

90. *Id.*

91. Howe, *supra* note 84, at B1.

92. Daddona, *supra* note 71.

93. Woods, *supra* note 30, at 17.

94. *Id.*

95. *Id.*

96. Howe, *supra* note 84, at B1.

work as long as long-term contracts are allowed and market share is monitored. More government regulation may help stimulate growth of infrastructure in the New England region. It will be interesting to see which ISO plans spur power plant development and if the New England ISO plan will lead to long term solutions for the region.

B. Nuclear Power Incentives

The EPAct of 2005 creates several incentives for power companies to invest in nuclear power, an electricity source that has not been developed in the United States in decades. Not one nuclear plant has been ordered in the U.S. in more than twenty years, and the last completed plant went online ten years ago.⁹⁷ The EPAct does several things to spur this renewed development, including protecting power companies from liability, provisions to help offset the costs of project construction delays, and loan guarantees and tax credits.

First, the EPAct provides basic liability insurance for the nuclear industry by extending the Price-Anderson Act⁹⁸ through 2025.⁹⁹ The Price-Anderson Act, which was set to expire at the end of 2005, provides nuclear plant operators with no-fault insurance in the event of a nuclear disaster.¹⁰⁰ Without the extension of the act or a similar provision, it would be impossible for a power company to insure itself against such an event, effectively killing the possibility for new construction of nuclear power.¹⁰¹

The act also provides “standby support” for “advanced nuclear facilities”—nuclear power plants with reactor designs approved by the Nuclear Regulatory Commission after December 31, 1993, or with substantially similar designs and comparable capacity.¹⁰² Standby support will help offset the expenses involved in delays in construction of new nuclear facilities—something that has plagued the nuclear industry since its inception.¹⁰³ Standby support covers delays that are beyond the control of the power company during the construction and start-up stages of opening a new plant.¹⁰⁴ In order to be a true incentive and to cause the power companies to act quickly to secure this support, the act makes it available only for the first several nuclear plants to be built.¹⁰⁵ For the

97. Mark D. Herlach & Karl H. Zeswitz, Jr., *Nukes Ride Again: The Energy Policy Act Returns Nuclear Energy to Center Stage*, ASAP, Jan. 1, 2006, at 42.

98. Price-Anderson Atomic Energy Damages Act, Pub. L. No. 85-256, 71 Stat. 576 (1957) (codified as amended in scattered sections of 42 U.S.C.).

99. 42 U.S.C. § 2210 (2006).

100. Herlach & Zeswitz, *supra* note 97, at 42.

101. *Id.*

102. 42 U.S.C. § 16014 (2006).

103. Herlach & Zeswitz, *supra* note 97, at 42.

104. 42 U.S.C. § 16014(b) (2006).

105. Herlach & Zeswitz, *supra* note 97, at 42.

first two plants, the act covers one hundred percent of delay costs, up to \$500 million per facility.¹⁰⁶ For the next four plants to be built, the act covers only 50 percent of the delays (with a \$250 million cap per facility) and support will be provided only during the first 180 days of the construction.¹⁰⁷ The delays covered by the standby support include those caused by the Nuclear Regulatory Commission's failure to meet the schedule for milestones for testing and inspection and for costs resulting from litigation that delays the opening of the plant.¹⁰⁸ Costs covered include principal and interest on debt and losses from having to purchase power from other sources due to the delay.¹⁰⁹

Because standby support is available for only the first six qualifying plants, there is concern that after the construction of those plants, the incentive to build additional nuclear power infrastructure will be lost. However, if these initial plants are successfully completed without delay and the corresponding expense, it will go a long way toward showing power companies that the milestones set by the Nuclear Regulatory Committee are firm and will be respected. By showing this, perhaps the NRC can prompt the construction of additional plants. If the traditional delays persist with these new plants, the United States may go several decades between construction of nuclear power plants once again—and the standby support experiment will cost taxpayers hundreds of millions of dollars.

Nuclear plants are also eligible for loan guarantees under the EPAct because they do not produce greenhouse gases.¹¹⁰ The act allows for the Secretary of Energy to provide loan guarantees for up to 80 percent of the total cost of construction, provided that the power company can assure repayment of the guarantee.¹¹¹ A loan guarantee is a guarantee with respect to the payment of all or part of the principal or interest on a debt obligation of a “non-Federal borrower to a non-Federal lender.”¹¹² The guarantees will make it easier for power companies to secure funding for their projects.

Qualifying nuclear power plants that start-up before 2021 and receive a megawatt capacity allocation from the Secretary of Energy will receive a tax credit of 1.8 cents per kilowatt-hour of electricity for the first eight years of their operation.¹¹³ Because only 6,000 kilowatt-hours can be allocated by the Secretary and a plant can receive the credit only on the

106. 42 U.S.C. § 16014(d) (2006).

107. *Id.*

108. 42 U.S.C. § 16014(c) (2006).

109. 42 U.S.C. § 16014(d) (2006).

110. Herlach & Zeswitz, *supra* note 97, at 42.

111. 42 U.S.C. § 16512 (2006).

112. 2 U.S.C. § 661a(3) (2006).

113. 26 U.S.C. § 45J (2006).

kilowatt-hours that are allocated to it, both a limitation and an incentive are present here.¹¹⁴ There is also a tax credit limitation of \$125 million per 1,000 megawatts per plant per year.¹¹⁵ Though capped, this incentive has the potential to apply to many more nuclear power plants than the six plants that will benefit from the standby support.

While some details remain to be worked out with each of these incentives—some, like standby support, have never been attempted before—they are already working to eliminate past problems that stalled the construction of new nuclear power plants.¹¹⁶ With the final rule regarding the standby support risk insurance published in the August 11, 2006, Federal Register, seventeen utilities had already submitted twenty-five new reactor license applications, including Southern Nuclear's proposal for two new reactors in Georgia.¹¹⁷ In September of 2006, Texas-based CPS Energy was considering proposals from TXU and NRG to increase the nuclear capacity in Texas, including an expansion of the South Texas Project near Bay City in Matagorda County, Texas.¹¹⁸

C. Clean Coal Power Incentives

As discussed above, electricity has long been generated with polluting coal-fired plants. An alternative to traditional coal-fired electric generation plants is a type of clean coal technology called integrated gasification combined cycle (IGCC).¹¹⁹ An IGCC plant converts coal to gas—instead of burning the coal in its usual pulverized form—and then captures the carbon so it is not released in emissions.¹²⁰ The United States has been referred to as the “Saudi Arabia of coal,” and it is estimated that the coal resources in this country can lead to 200 years of electricity production.¹²¹ Because coal in its pulverized form does not burn cleanly, the U.S. has been moving away from coal as a power source in recent decades. If the IGCC technology proves effective, the country can once again rely on one of its most plentiful natural resources to produce electricity. The plants can cost a premium—likely about 20

114. *Id.*

115. *Id.*

116. Jenny Weil, *Incentives in Energy Policy Law Still Require Work, Industry Says*, NUCLEONICS WK., May 25, 2006, at 12.

117. *Pace Substantially Quickens to Build Next Wave of Nuclear Reactors*, ENERGYWASHINGTON WK., Aug. 23, 2006.

118. Vicki Vaughan, *San Antonio-based Energy Firm Considers Nuclear Partnership in Texas*, SAN ANTONIO EXPRESS-NEWS, Sept. 1, 2006.

119. Shannon Davis, *IGCC Coal Gas Plan Hinges on State Nod to Upfront Cost Recovery*, ENERGYWASHINGTON WEEK, Mar. 1, 2006.

120. *GE Chief Predicts \$5 Billion in Orders for Coal Gasification by 2010*, ENERGYWASHINGTON WK., June 28, 2006.

121. Jay Kipper, Assoc. Dir., Bureau of Econ. Geology, Univ. of Tex. at Austin, Address at the Texas Journal of Oil, Gas and Energy Law Symposium: Emerging Energy Technologies (Feb. 15, 2007).

percent more than a pulverized coal plant—but there are several federal and state incentives that could make plant construction profitable.¹²²

The Energy Policy Act of 2005 includes several incentives to promote the construction of coal plants that use the IGCC technology. Because these plants theoretically will greatly reduce or eliminate the emission of greenhouse gases, they are eligible for the same loan guarantees as the nuclear plants, as discussed above.¹²³ Again, provided they will be repaid, these guarantees will cover up to 80 percent of the total cost of construction of the plant.¹²⁴ One issue that has to be worked out with each plant is the technology that will be used for the carbon sequestration. Several of the proposed plants will use natural underground geologic formations to hold the carbon gas. Without a resolution on where the carbon will be stored, there can be no loan guarantees.¹²⁵ IGCC facilities can also qualify for a 20 percent clean coal investment tax credit under the act.¹²⁶

There are currently two commercial IGCC plants operating in the United States, one in Indiana and another in Florida.¹²⁷ Several other high-profile projects have been proposed in the past few months. Texas and Illinois were announced as the two finalists for the FutureGen project in August of 2006.¹²⁸ A \$1 billion, 275-megawatt, zero-emission IGCC coal plant will be built on the winning site, which will be chosen from four possible locations later this year.¹²⁹ The carbon from the project will be injected deep underground and sequestered in geologic formations.¹³⁰ The Department of Energy will pay \$620 million of the cost for the plant with the remaining funds coming from private industry partners—a consortium made up mainly of energy and coal companies.¹³¹ The project will also receive tax incentives and streamlined permitting.¹³²

The Texas FutureGen proposals involve sequestering much of the carbon dioxide in brine aquifers.¹³³ It is estimated that Texas has storage capacity in these natural geologic formations to hold about 250 years of carbon gas emissions.¹³⁴ Some of the carbon dioxide may also be sold and

122. *GE Chief Predicts \$5 Billion in Orders for Coal Gasification by 2010*, *supra* note 120.

123. *Id.* See Part IV.b., *supra*.

124. 42 U.S.C. § 16513 (2006).

125. *GE Chief Predicts \$5 Billion in Orders for Coal Gasification by 2010*, *supra* note 120.

126. Michael Schmidt, *Xcel Plans IGCC Plant that Captures Carbon; Counting on Energy-bill Aid*, *INSIDE ENERGY WITH FED. LANDS*, Aug. 21, 2006, at COAL 3.

127. *Id.*

128. *Illinois, Texas Only States Left in Running on FutureGen 'Short List'*, *ENERGY WASHINGTON WK.*, Aug. 2, 2006.

129. *Id.*

130. *Id.*

131. *Id.*

132. *Id.*

133. Kipper, *supra* note 121.

134. *Id.*

sent via pipeline to West Texas and other parts of the state where it can be injected into oil and gas reservoirs in order to increase production.¹³⁵ Injection of the gas into the non-producing or slow-producing reservoirs can lead to an estimated ten to fifteen percent increase in production.¹³⁶ Expansion of carbon dioxide transportation infrastructure may lead to increased oil production in other parts of Texas and throughout the country.¹³⁷ The coal in Texas exists in the form of lignite, which gasifies very well.¹³⁸ The lignite will be surface mined throughout the state.¹³⁹

Another project garnering attention is a possible 300 to 350-megawatt IGCC plant in Colorado.¹⁴⁰ Because of provisions in the EPAct requiring a high-altitude plant, the federal government would pick up half of the plant's cost, though the loan guarantee would not be available.¹⁴¹ High elevations, like those in the Rocky Mountains, can have an adverse effect on the efficiency of the plant due to the thin air.¹⁴² Other plants have been proposed in the Midwest, where coal is a plentiful energy source.¹⁴³ Expansive success of this technology will help keep large quantities of carbon dioxide out of the atmosphere. These plants can be the key to energy independence, as they provide a more attractive, clean alternative to the existing coal-fired electric plant infrastructure while continuing to allow the use of coal—one of the United States' most widely available resources—as a fuel source for the nation's expanding power needs.

D. Incentives for Wind Power and Other Renewables

Under several guises, the federal government and many state governments have been promoting alternative energy sources such as wind, solar, and other renewable fuels as a means of producing electricity. Use of these sources would reduce the emission of pollutants and greenhouse gases released into the atmosphere, would help to wean the United States off its reliance on foreign oil, and could help to keep the nation secure. However, for decades an issue with these sources was that they were not cost-effective for power generators to use in their power plants. Government incentives on both the state and federal levels and large increases in the costs of traditional fossil fuels have helped to

135. *Id.*

136. *Id.*

137. *Id.*

138. *Id.*

139. *Id.*

140. Schmidt, *supra* note 126, at COAL 3.

141. *Id.*

142. *Id.*

143. Duke, *Vectren Take Step Toward Construction of Indiana IGCC*, U.S. COAL REV., Sept. 11, 2006. See also Davis, *supra* note 119.

reduce the disparity between the costs of traditional coal-fired or gas-fired plants and renewable sources of energy.¹⁴⁴

Wind power has seen the most growth of any electricity generating technology, growing more than twenty-seven percent from 2000 to 2004.¹⁴⁵ Because of the unique attributes of wind energy production, FERC has taken steps to examine its rules to make sure that they are not discriminatory.¹⁴⁶ The Commission made several changes to the standard interconnection procedures and agreement that were based on the needs of traditional generators in order to accomplish this goal.¹⁴⁷ Congress has also taken steps to promote wind as a power source. With the passage of the EPAct of 2005, the Federal Production Tax Credit for wind-generated electricity was extended through 2007.¹⁴⁸ Late in 2006, proposals were introduced in the House to further extend the production tax credit through the end of 2008.¹⁴⁹ The tax credit is 1.9 cents per kilowatt-hour and lasts for the first ten years of project production.¹⁵⁰ It allows for an increase in cash flow at these projects of about 38 percent during that period.¹⁵¹ Wind power projects are also eligible for the same loan guarantees as the nuclear and IGCC plants discussed above.¹⁵² The guarantees can cover up to 80 percent of the total cost of construction of the plant, provided there is a plan for repayment.¹⁵³

Individual states have added to the incentives for wind and other renewable sources.¹⁵⁴ Twenty-one states and the District of Columbia have enacted renewable portfolio standards that require electric generators to provide some percentage of their power from renewable sources.¹⁵⁵ Many of the portfolio percentages increase over time, making future investment necessary.¹⁵⁶ States also offer a wide range of other incentives—such as tax exemptions and loan programs—that work with federal incentives to further promote these technologies.¹⁵⁷

NIMBY issues have created obstacles for wind farm developers, but recent legal decisions and political developments have helped power companies to continue with their construction. Local groups have

144. Darrell Blakeway & Carol Brotman White, *Tapping the Power of Wind: FERC Initiatives to Facilitate Transmission of Wind Power*, 26 ENERGY L. J. 393, 393 (2005).

145. *Id.*

146. *Id.* at 394.

147. *Id.*

148. 26 U.S.C. § 168 (2006).

149. H.R. 6408, 109th Cong., (2nd Sess. 2006).

150. Blakeway & White, *supra* note 144, at 405.

151. *Id.*

152. *GE Chief Predicts \$5 Billion in Orders for Coal Gasification by 2010*. See Part IV.a.–b., *supra*.

153. 42 U.S.C. § 16513 (2006).

154. Blakeway, *supra* note 144, at 405.

155. *Id.*

156. *Id.*

157. *Id.*

continued to attempt to stop the initial permitting of wind projects through lawsuits. While the power generators have won each of the cases for injunction against the permitting of their projects, the threats of nuisance lawsuits and local political action remain. One factor that will likely aid wind farm owners in their legal battle is that modern nuisance laws can now take into account other factors in addition to the unreasonable interference with the plaintiff's use and enjoyment of his land.¹⁵⁸ Courts can now consider the social utility of the conduct that is being complained about.¹⁵⁹ Because wind farms provide a greater social good in the form of clean electricity for many, and because wind energy is being heavily promoted on the federal and state levels through initiatives such as tax credits and renewable portfolio requirements, it is likely that the power companies will be victorious in future litigation over this issue.¹⁶⁰ Several state governments are also beginning to prohibit local governments from enacting legislation to prevent or impede the construction of wind farms in their jurisdictions.¹⁶¹

Incentives for wind energy and other renewables have led to massive investment from private equity firms.¹⁶² In 2000 private equity firms participated in only nine deals in alternative energy sources, totaling \$163 million of investment.¹⁶³ Due in part to the incentives, this figure increased seven times to sixty-three projects totaling \$3.7 billion in 2005.¹⁶⁴ However, the continued short-term extension of the tax credit may have prevented even more potential growth in the wind energy market. Even though the credit has been continuously renewed on a yearly or semi-yearly basis, there is no guarantee that it will be renewed again each time the credit nears the end of its life. A longer term commitment to wind energy by Congress would go a long way toward helping to consistently fund more projects in the future.

V. CONCLUSION

The restructuring of the electric markets from a vertically integrated model based on local monopoly and government regulation to one in which competitive forces drive the prices paid by power customers has greatly changed the industry. While the continued deregulation has led to lower rates for most customers, there continues to be a lack of power

158. Smith, *supra* note 52.

159. *Id.*

160. *Id.*

161. *Id.*

162. Joan Harrison, *Renewable Energy Sector Attracts Private Equity Money. The Budding Sector which Struggled for Years to Attract Attention, Now is Quickly Running Out of Investment Opportunities for Eager Investors*, GLOBAL NEWS WIRE, September 1, 2006.

163. *Id.*

164. *Id.*

generation in the United States. This competition, however, has not always spurred increased infrastructure development. While generation of electricity has been deregulated in much of the country, transmission and distribution continue to exist as regional monopolies. Obstacles such as environmental regulations, opposition from local residents, fear that capital expenditures will not be recovered, delays, and liability have continued to deter the construction of new power plants.

The federal government, state governments, and regional ISO's have stepped in to offer several incentives to spur the development of new power plants. Independent System Operators have tried to increase development through both competitive and regulatory measures. Incentives for nuclear power include government protection from liability, standby support for delays caused by government agencies, and loan guarantees. Loan guarantees and other federal and state funding are now available for clean coal plants. Incentives for renewable technologies like wind energy have led to exponential increases in investment from private equity. These incentives have already increased the number of proposals for power-generating facilities across the country and will likely allow Americans to keep their lights on for the next several decades.