A Triple Bottom Line for Electric Utility Regulation: Aligning State-Level Energy, Environmental, and Consumer Protection Goals†

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INTRODUCTION

Energy infrastructure across the United States is aging, and plant retirements are increasing due to a combination of newly implemented and impending environmental requirements and inexpensive natural gas.[1] Utilities and regulators will have to decide how to update or replace aging facilities—estimated at a cost of $1.5 to $2 trillion over the next

1. *27 gigawatts of coal-fired capacity to retire over next five years*, U.S. ENERGY INFO. ADMIN. (July 27, 2012), http://www.eia.gov/todayinenergy/detail.cfm?id=7290 (predicting that twenty-seven gigawatts from 175 coal-fired power plants will retire between 2012 and 2016).

twenty years.[2] These decisions will affect consumer prices and the environmental impacts of the electricity sector for decades. Future environmental requirements have the potential to significantly impact power plant operating costs as well as energy investment decisions, creating price risk for consumers if utilities make investments today on power plants that are more expensive to operate in the future.[3] For these reasons, considering the direct link between consumer prices and environmental protection is an important element of maintaining affordable and reliable electricity.

States wield the primary authority to regulate electric utilities and play a critical role in implementing and enforcing both state and federal environmental law. While states seek to provide citizens with affordable electricity, reliable electricity, and a healthy environment, they commonly delegate portions of these interrelated goals to multiple state agencies with very different mandates.[4] For instance, state public utility commissions ("PUCs") or public service commissions ("PSCs") primarily serve to protect consumers, balancing consumers' interest in affordable rates against the utility's financial health, which is necessary to attract capital and provide reliable service.[5] State environmental agencies protect the public health and the environment by developing and enforcing standards that may require utilities to install costly pollution controls, retire plants, and raise rates.[6] A third type of agency, the state energy office, influences the affordability, reliability, and environmental impact of electricity production within the state by developing and implementing additional state energy goals, such encouraging investment in energy efficiency and renewable energy.[7]

Aligning state policy goals can help keep the lights on and electricity prices affordable while also promoting investments in clean energy technologies and efficiency measures that protect public health and the environment. This Article explores the opportunities and challenges to

2. MARC W. CHUPKA ET AL., TRANSFORMING AMERICA'S POWER INDUSTRY: THE INVESTMENT CHALLENGE 2010–2030, at vi (2008), *available at* http://www.brattle.com/_documents/uploadlibrary/upload725.pdf.

3. *See infra* Part III.B.4.

4. *See infra* Part II (further describing the disparate roles and mandates of the three primary categories of state agencies often tasked with energy regulation and environmental protection).

5. WILLIAM T. GORMLEY, JR., THE POLITICS OF PUBLIC UTILITY REGULATION 24 (1983).

6. Brandon Hofmeister, *Roles for State Energy Regulators in Climate Change Mitigation*, 2 MICH. J. ENVTL. & ADMIN. L. (forthcoming 2013) (manuscript at n.2), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2060241.

7. *E.g.*, *About Us*, NAT'L ASS'N OF STATE ENERGY OFFICIALS, http://www.naseo.org/about/index.html (last visited Jan. 5, 2013) (describing the range of programs state energy offices are responsible for including energy efficiency and renewable energy programs).

aligning state energy, environmental, and consumer protection goals within the current regulatory system, and proposes a "triple bottom line" ("TBL") approach to state utility regulation to achieve this alignment.[8] The original TBL concept encourages businesses and governments to measure value by considering environmental and social dimensions in addition to fiscal considerations.[9] By comparison, the TBL approach for electric utility regulation proposed here aims to harmonize *existing* state policy goals of ensuring: (1) affordable electricity; (2) reliable electricity; and (3) protection of public health and the environment.[10] Specifically, it allows officials across state governments to consider how their roles affect all three TBL pillars, thereby enabling informed decision making and comprehensive problem solving to improve outcomes across all three goals.

Part I of this Article describes the interaction of state energy, environmental, and consumer protection goals. Part II describes three distinct state entities that carry out these goals: PUCs, state environmental agencies, and state energy offices. Part III provides context for utility and regulator decision making today. It describes the United States' current investment needs and uncertainties about the future, including the challenges of planning utility investments under an increasingly stringent set of environmental regulations. Part IV provides examples of actions that PUCs and state legislatures have already taken that demonstrate the value and feasibility of the TBL approach. Part V describes challenges to coordinating state energy, environmental, and consumer protection goals under the current regulatory system. Part VI describes the TBL approach to decision making within state electric utility regulation. This Part operationalizes the TBL approach, providing an overview of specific steps states can take, including both steps that agencies can take on their own and steps that state legislatures can take.

I. INTERACTION BETWEEN ENERGY, ENVIRONMENTAL, AND CONSUMER PROTECTION GOALS

In the United States, various state, federal, and local government bodies set policy that affects energy infrastructure, environmental

8. As described further below, the TBL approach is most relevant for states with a traditional model of utility regulation whereby electric utilities operate as monopolies and utility commissions determine the rates charged to consumers, including whether a utility may recover the costs of specific capital investments through rates. *See infra* notes 35–41 and accompanying text.

9. *See, e.g.*, Christopher L. Bell, *Communication and Sustainable Development*, 54 ROCKY MTN. MIN L. INST. 28B-1, 28B-2 (2008).

10. *See infra* Part VI.

outcomes, and electricity prices. Utilities and utility regulators must consider a host of economic and legal factors when making decisions about energy infrastructure. These factors include evaluating whether a new facility is necessary, when to upgrade or retire an existing facility, which type of electricity generation facility they will favor, and the most effective means to meet projected electricity demand in a cost-effective manner.[11] These diverse economic and legal factors also directly affect, and may compete with, one another.

For example, the state PUC decision-making process affects electricity generation decisions, technology adoption, and the environmental footprint of electric utilities. In some instances, state utility regulation may lead utilities to construct facilities that emit higher levels of pollution in order to maintain relatively lower electricity prices, ignoring, for example, the possibility that more stringent air pollution rules in the future may encourage reliance on electricity from conventional pulverized coal plants over a nuclear plant or a wind farm with a natural gas plant as backup.[12] This decision could make air pollution problems more acute, conflicting with environmental goals and potentially leading to calls for more stringent pollution controls. Establishing more stringent air pollution limits, in turn, can have a direct impact on the operating costs of power plants (and thus consumer prices) by requiring installation of new pollution control technologies.[13]

Acknowledging the interdependence of consumer protection and environmental regulation, policymakers, practitioners, and scholars have all called for states to align these policy goals.[14] Yet, these calls to action

11. In most states, for a PUC to approve a new power plant investment, and allow its construction, it must find that the investment serves the "public convenience and necessity," meaning that there is demand for the new facility and that its attributes—which might include site-specific, technological, and environmental features—are in line with the public interest. *See infra* notes 49–51 and accompanying text.

12. *See infra* notes 108–14 and accompanying text.

13. Clinton J. Andrews & Shivani Govil, *Becoming Proactive About Environmental Risks: Regulatory Reform and Risk Management in the U.S. Electricity Sector*, 23 ENERGY POL'Y 885, 885 (1995) (stating that environmental regulations for power plants are a moving target, that utilities in many jurisdictions now must reduce nitrogen oxide emissions from existing plants, and that new environmental requirements can increase both construction and operating costs). Note that sustained low natural gas prices may address some of the near-term and long-term costs associated with regulatory risks. *See* Aranya Venkatesh et al., *Implications of Changing Natural Gas Prices in the United States Electricity Sector for SO_2, NO_X, and Lifecycle GHG Emissions,* 7 ENVTL. RES. LETTERS, Aug. 2012, at 1, 7 (describing the expected shift toward natural gas generation and accompanying emissions reductions).

14. *See, e.g.*, RONALD J. BINZ ET AL., CERES, PRACTICING RISK-AWARE UTILITY REGULATION: WHAT EVERY STATE REGULATOR NEEDS TO KNOW 8 (2012), *available at* http://www.rbinz.com/Binz%20Sedano%20Ceres%20Risk%20Aware%20Regulation.pdf (describing the need for state utility regulators to consider new environmental regulation and

focus primarily on the need for utilities and utility regulators to consider future environmental compliance *costs* and address the *price risk* of new environmental requirements.[15] While utilities and ratepayers can benefit from price risk considerations, states would benefit from a more comprehensive approach to utility regulation that integrates the price risk of environmental compliance and state-level public health and environmental goals as they relate to energy infrastructure.[16]

Although every method of generating electric power has public health and environmental consequences, emissions of sulfur dioxide, nitrogen oxides, hazardous air pollutants, and greenhouse gases ("GHGs") from coal-fired power plants are of particular concern[17] In addition to the direct effects of breathing sulfur dioxide and nitrogen oxides, both pollutants interact with the environment to form secondary pollutants such as fine particulate matter, ozone, and acid rain.[18] Epidemiologic studies have linked exposure to high concentrations of sulfur dioxide, nitrogen oxides, and particulate matter to a host of respiratory and cardiovascular illnesses—including lung dysfunction, bronchoconstriction, cough, apnea, hypotension, and hypertension—and to emergency room visits for respiratory diseases especially in children, older adults, and asthmatics.[19] Hazardous air pollutants, such as mercury (a neurotoxin that is especially harmful to children), are dangerous even in low concentrations.[20] Fossil fuel-fired power plants are the largest contributor to U.S carbon dioxide emissions.[21]

availability of natural resources such as water among other risks); Lincoln L. Davies, *Power Forward: The Argument for a National RPS*, 42 CONN. L. REV. 1339, 1394 (2010) (describing the potential for regulatory synergies between energy and environmental law); Hofmeister, *supra* note 6, at 16; Andrews & Govil *supra* note 13, at 890–91; Amy J. Wildermuth, *The Next Step: The Integration of Energy Law and Environmental Law*, 31 UTAH L. REV. 369, 388 (2011); *Conference on Environmental Protection & Clean Reliable Energy: Governments Working Together*, NAT'L ASS'N OF REG. UTIL. COMMISSIONERS, http://www.naruc.org/3n/ (last visited Jan. 5, 2013).

15. *See, e.g.*, BINZ ET AL., *supra* note 14, at 8, 10 (describing risks regulators should manage for and the long-term price benefits); Andrews & Govil *supra* note 13, at 885 ("[S]uboptimal [environmental] compliance represents a threat with measurable consequences for individual firms and for the economy as a whole.").

16. *See infra* Part IV.B.2 (describing the broad benefits of North Carolina's Clean Smokestacks Act and Colorado's Clean Air-Clean Jobs Act, each of which addressed state environmental goals and eased compliance with forthcoming federal environmental regulations simultaneously).

17. *See* Ananth P. Chikkatur et al., *Coal Power Impacts, Technology, and Policy: Connecting the Dots*, 36 ANN. REV. ENV'T. & RESOURCES 101, 105–08, 113 (2011).

18. *Id.*; *see* Marilena Kampa & Elias Castanas, *Human Health Effects of Air Pollution*, 151 ENVTL. POLLUTION 362, 363 (2008).

19. Chikkatur et al., *supra* note 17, at 105–08, 113.

20. JAMES E. MCCARTHY, CONG. RESEARCH SERV., MERCURY EMISSIONS FROM ELECTRIC POWER PLANTS: STATES ARE SETTING STRICTER LIMITS 1 (2006), *available at* http://www.

Current technology can mitigate many of the air pollution concerns associated with coal-fired electricity generation, but the installation of those technologies can be cost prohibitive, especially when installation entails retrofitting an existing plant.[22] This is not to argue that regulators should view coal-fired electricity generation as an inappropriate option for electricity generation, but that regulators should acknowledge the need for utilities and power plant developers to assess the relative costs of electric generating alternatives over the lifetime of the system, including the real risk of increasingly stringent environmental requirements as utilities undertake a major round of new infrastructure investments.

Recent studies of electric infrastructure investments in Kentucky and North Carolina demonstrate the feasibility and value of considering life cycle environmental compliance costs and state environmental goals alongside cost and reliability. To evaluate a Kentucky Utilities Company plan to retrofit a coal plant to comply with two new rules from the U.S. Environmental Protection Agency ("EPA"),[23] researchers at Duke University used a risk-based decision model that identifies the least-cost compliance strategy under a range of scenarios, including likely future environmental rules that the utility did not consider.[24] The modeling exercise demonstrates that the utility's plan to retrofit the plant to comply with new Clean Air Act ("CAA") rules appears cost-effective across a

policyarchive.org/handle/10207/bitstreams/19034.pdf ("Mercury is a potent neurotoxin that can cause adverse health effects (principally delayed development, neurological defects, and lower IQ in fetuses and children) at very low concentrations.").

21. INTERAGENCY TASK FORCE ON CARBON CAPTURE & STORAGE, REPORT OF THE INTERAGENCY TASK FORCE ON CARBON CAPTURE AND STORAGE 7 (2010), *available at* http://www.fe.doe.gov/programs/sequestration/ccstf/CCSTaskForceReport2010.pdf.

22. *See* N. AM. ELEC. RELIABILITY CORP., 2012 LONG-TERM RELIABILITY ASSESSMENT 5 (2012), *available at* http://www.nerc.com/files/2012_LTRA_FINAL.pdf (describing expected retirements of coal-fired power plants due to a combination of costly environmental control requirements and low natural gas prices).

23. Kentucky Utilities Company proposed to retrofit the Mill Creek coal-fired power plant to comply with the Mercury and Air Toxics Standard and the (now vacated) Cross-State Air Pollution Rule. Mercury and Air Toxics Standards, 77 Fed. Reg. 9304, 9367–70 (Feb, 16, 2012) (to be codified at 40 C.F.R. pts. 60, 63); Cross-State Air Pollution Rule, 76 Fed. Reg. 48,208, 48,208 (codified at 40 C.F.R. pts. 51, 52, 72, 78, 97).

24. DAVID HOPPOCK ET AL., NICHOLAS INST. FOR ENVTL. POL'Y SOLUTIONS, NI WP 12-03, DETERMINING THE LEAST-COST INVESTMENT FOR AN EXISTING COAL PLANT TO COMPLY WITH EPA REGULATIONS UNDER UNCERTAINTY 31 (2012), *available at* http://nicholasinstitute.duke.edu/climate/lowcarbontech/determining-the-least-cost-investment-for-an-existing-coal-plant-to-comply-with-epa-regulations-under-uncertainty. The risk-based decision model addresses potential future regulations that the utility's integrated resource plan and environmental compliance plans do not consider governing coal combustion residuals, cooling water standards, and a future carbon price. *Id.*

range of regulatory scenarios, which vary the timing and stringency of the future rules.[25] It also suggests that if the plant faces a carbon price in the future, retiring and replacing the plant may be the least-cost compliance option.[26] With new tools like the risk-based decision model, PUCs can make more informed decisions that balance maintaining affordable electricity rates today with protecting affordable rates in the future.[27]

Another study, which examines North Carolina's Clean Smokestacks Act,[28] finds that early action that addresses state environmental goals ahead of future environmental requirements can lead to cost savings for ratepayers.[29] North Carolina required its investor-owned utilities to reduce sulfur dioxide and nitrogen oxide emissions from in-state power plants by more than seventy percent over an eleven-year period.[30] As a result, North Carolina utilities are now well-positioned to comply with new federal regulations governing hazardous air pollutants from coal-fired power plants and sulfur dioxide and nitrogen oxide emissions that affect air quality in downwind states.[31] The study further estimates that the Clean Smokestacks Act created between six and sixteen billion dollars in health benefits for North Carolina citizens, and could save ratepayers millions, depending on actual costs to comply with new EPA rules on a relatively short timeline.[32] While the study analyzes compliance benefits relative to the Mercury and Air Toxics Standard in combination with the recently vacated Cross-State Air Pollution Rule, it demonstrates both the opportunity and value for states to move ahead of

25. *Id*.

26. *Id*.

27. A Beta Version of PowerOptInvest, the risk-based decision-making tool, is now available for non-commercial use by state utility commissions, environmental regulators, state and local energy officials, utilities, and non-governmental organizations. *PowerOptInvest Utility Investment Decision Model (Beta Version)*, NICHOLAS INST. FOR ENVTL. POL'Y SOLUTIONS, http://nicholasinstitute.duke.edu/climate/poweroptinvest (last visited Jan. 5, 2013).

28. Clean Smokestacks Act, 2002 N.C. Sess. Laws 4 (codified as amended at N.C. GEN. STAT. § 62-143 (2011) and N.C. GEN. STAT. §§ 143-215.105–.114C (2011)).

29. DAVID HOPPOCK ET AL., NICHOLAS INST. FOR ENVTL. POL'Y SOLUTIONS, NI WP 12-05, BENEFITS OF EARLY STATE ACTION IN ENVIRONMENTAL REGULATION OF ELECTRIC UTILITIES: NORTH CAROLINA'S CLEAN SMOKESTACKS ACT 3 (2012), *available at* http://nicholasinstitute.duke.edu/climate/policydesign/benefits-of-early-state-action-in-environmental-regulation-of-electric-utilities.

30. N.C. GEN. STAT. § 143-215.107D (2011).

31. HOPPOCK ET AL., *supra* note 29, at 9–11.

32. *Id.* at 20 (finding that whether ratepayers pay more or less with the Clean Smokestacks Act depends on actual future costs to comply with new EPA regulations, and that health benefits are approximately an order of magnitude greater than potential increases in ratepayer cost).

federal requirements, especially when early compliance actions align with state environmental goals.[33]

II. State Actors That Affect Electric Utility Decision Making

State regulators, with direction from state law and federal mandates, directly influence energy infrastructure decisions and environmental outcomes. Non-regulatory state agencies that implement programs to encourage consumer investments in energy efficiency and renewable energy products have an indirect effect on the type and volume of energy infrastructure needed and on the environment. This Part describes the primary state entities that oversee aspects of electric utility operations.[34] Specifically, it describes the stated objectives of PUCs, state environmental regulators, and state energy offices with regard to the provision of affordable, reliable electricity and a healthy environment, and analyzes how their objectives overlap. This Part also explores the challenges presented by the traditional distinction between regulators who oversee the economic activity of utilities and regulators who focus on limiting the environmental impacts of utilities.

A. Public Utility Commissions

Public utility commissions protect ratepayers by ensuring that investor-owned utilities deliver electricity at reasonable rates and in sufficient quantity to avoid brownouts or blackouts.[35] The "traditional" model of utility regulation in the United States arose from the belief that a single utility can provide electricity at a lower price than retailers in a competitive market.[36] The industry is characterized by high fixed costs

33. The D.C. Circuit vacated the Cross State Air Pollution Rule ("CSAPR") on August 21, 2012, and directed the EPA to develop a new rule to address upwind states' contribution to NAAQS nonattainment in downwind states. EME Homer City Generation, L.P. v. EPA, 696 F.3d 7, 12 (D.C. Cir. 2012). The EPA developed the CSAPR to replace the Clean Air Interstate Rule, which the D.C. Circuit vacated in 2008 and remains in place pending a replacement. *See id*.

34. This Part does not discuss the role of state legislatures in detail, but lawmakers also play a critical role setting priorities for all three categories of state officials by articulating which risks utility regulators should consider or by providing policy certainty where state public health and environmental goals supersede federal policy uncertainty. In addition, state law influences how public officials from different governmental agencies and with differing roles interact, which can serve to help or hinder the achievement of interdependent energy, environmental, and consumer protection objectives.

35. *See, e.g.*, Raymond Jackson, *Regulation and Electric Utility Rate Levels*, 45 LAND ECON. 372, 373 (1969); Greg R. Jarrell, *The Demand for State Regulation of the Electric Utility Industry*, 21 J.L. & Econ. 269, 269–76 (1978).

36. Douglas Gagax & Kenneth Nowotny, *Competition and the Electric Utility Industry: An Evaluation*, 10 YALE J. ON REG. 63, 64 (1993).

(for example, electricity generation, transmission, and distribution infrastructure) and relatively low operating costs.[37]

The current regulatory process differs significantly from state to state. Approximately half of the states maintain traditional rate-regulated electricity sectors, with prices structured to meet utilities' operating costs plus a reasonable rate of return.[38] In these states, regulators act as a substitute for competition, and prevent the utility from charging unreasonable rates to ensure that ratepayers benefit from the economy of scale.[39] The remaining states (referred to as restructured or deregulated states) have replaced the system of regulated monopolies with wholesale power markets, and have in some cases introduced retail competition.[40] In restructured or deregulated states, PUCs continue to regulate the delivery of electricity and prices charged to ratepayers, but electricity generation occurs in wholesale electricity markets typically beyond the reach of a state PUC.[41]

The TBL concept proposed here applies more directly to traditionally regulated states because commissioners in these states have a direct role in infrastructure investment decisions because, for example, they determine the extent to which a utility may recoup its costs through electricity rates.[42] Nonetheless, restructured states could also benefit from the TBL process. While PUCs in restructured states have little, if any, direct influence on generation infrastructure investments,[43] the

37. *Id.*

38. *Status of Electricity Restructuring by State,* U.S. ENERGY INFO. ADMIN., http://www.eia.doe.gov/cneaf/electricity/page/restructuring/restructure_elect.html (last visited Jan. 5, 2013) (detailing graphically which states have replaced their monopoly systems for electric utilities with a competitive system).

39. *See, e.g.*, William J. Hausman & John L. Neufeld, *The Market for Capital and Origins of State Regulation of Electric Utilities in the United States*, 62 J. ECON. HIST. 1050, 1050 (2002) (stating that now most privately-owned electric utilities in the United States must have the prior approval of state regulatory agencies to build new capacity, to change rates, and to seek new financing through the capital market). Alternatively, in states with "restructured" markets, which have replaced the traditional monopoly system of electric utilities with competitive electricity markets, electricity generators have the opportunity to weigh the risks associated with the future costs of GHG emissions and other environmental regulations, as well as the benefits of driving investment in innovative technologies. *See* David B. Spence, *Can Law Manage Competitive Energy Markets?*, 93 CORNELL L. REV. 765, 765–66 (2008).

40. PAUL L. JOSKOW, MIT CTR. FOR ENERGY & ENVTL. POL'Y RESEARCH, THE DIFFICULT TRANSITION TO COMPETITIVE ENERGY MARKETS IN THE U.S. 1–3 (2003), *available at* http://dspace.mit.edu/bitstream/handle/1721.1/45001/2003-008.pdf?sequence=1.

41. Robert M. McClanahan, *Electric Deregulation: Brace Yourselves for the Far-Flung Effects of Electric Industry Deregulation on Metering, Billing, and Customer Information Systems*, IEEE INDUSTRY APPLICATIONS MAG., Mar.–Apr. 2002, at 11, 13.

42. *See, e.g.*, Jarrell, *supra* note 35, at 269–76 (describing the role of public utility commissions in traditionally regulated states); *see also* Jackson, *supra* note 35, at 373 (same).

43. *See, e.g.*, Spence, *supra* note 39, at 765.

environmental regulators and energy office officials in the same states still influence energy infrastructure decisions through oversight of air quality, water quality, waste disposal and storage, renewable energy mandates, and energy efficiency programs.[44] The TBL framework can, therefore, lead to more coordinated decision making and result in a cleaner electricity infrastructure even in restructured markets.

The PUC process varies from state to state,[45] but most PUCs in states with traditional regulation operate as adjudicatory bodies, deciding individual cases based on the facts presented to them.[46] PUCs in these states oversee a utility's choice of power sources by approving new capital investments and a utility's long-term planning process.[47] Typically, before approving a new power plant investment and its construction, utility commissioners must find that the investment serves the "public convenience and necessity," meaning that there is demand for the new facility and that its attributes—which might include site-specific, technological, and environmental features—are in line with the public interest.[48] PUCs also review utility investment decisions and management choices after construction using two criteria: (1) under a "prudent investment" standard, the PUC ensures that the utility does not charge ratepayers to recoup unnecessary investments;[49] and (2) PUCs apply a "used and useful" test to ensure that the investment results in a direct benefit to ratepayers.[50] PUCs use these reviews to determine

44. *See* sources cited *infra* notes 65–68 and accompanying text.

45. As of September 2010, Oregon, Texas, Illinois, Michigan, Ohio, Pennsylvania, Maryland, District of Columbia, Delaware, New York, New Jersey, Massachusetts, Connecticut, Rhode Island, New Hampshire, and Maine had adopted some form of electricity restructuring. Seven additional states had begun and subsequently suspended the restructuring process. *See Status of Electricity Restructuring By State*, ENERGY INFO. ADMIN., http://www.eia.gov/cneaf/electricity/page/restructuring/restructure_elect.html (last visited Jan. 5, 2013).

46. Terrence J. Fitzpatrick, *The Tension Between Policy and Principle in the Adjudications of the Pennsylvania Public Utility Commission*, 13 WIDENER L.J. 101, 107 (2003).

47. STATE & LOCAL ENERGY EFFICIENCY ACTION NETWORK, USING INTEGRATED RESOURCE PLANNING TO ENCOURAGE INVESTMENT IN COST-EFFECTIVE ENERGY EFFICIENCY MEASURES 3 (2011), *available at* http://www1.eere.energy.gov/seeaction/pdfs/ratepayer_efficiency_irpportfoliomanagement.pdf.

48. *E.g.*, GA. CODE ANN. § 46-3A-3 (2004); IND. CODE ANN. § 8-1-8.5-2 (LexisNexis 2012); KY. REV. STAT. ANN. § 278.020(1) (LexisNexis 2009); MISS. CODE ANN. § 77-3-11 (2010); N.C. GEN. STAT. § 62-110 (2011); W. VA. CODE ANN. § 24-2-11 (LexisNexis 2008); *see also* Hausman & Neufeld, *supra* note 39, at 1050.

49. Richard J. Pierce, Jr., *Regulatory Treatment of Mistakes in Retrospect: Canceled Plants and Excess Capacity*, 132 U. PA. L. REV. 497, 511 (1984).

50. Iowa Pub. Serv. Co., 46 Pub. Util. Rep. (PUR) 4th 339, 368 (Iowa St. Commerce Comm'n Mar. 3, 1982) ("This approach is based on the principle that ratepayers should provide shareholders with a return only on so much of the utility's investment that is actually in use and needed to meet their demands.").

retrospectively which costs a utility may charge in rates.[51] In some cases, a PUC may allow utility rates to include costs of cancelled investments when the PUC has previously determined that an investment was "prudent" at the time, even though it never became "used and useful."[52]

PUCs have some latitude to determine what constitutes the public interest or a prudent investment. While PUCs often wait for policy certainty before approving environmental control investments,[53] some PUCs have used their discretion to allow utility investments that take into account future environmental requirements.[54] State law influences the factors that PUCs consider when approving investments in new power plants, as well as the planning strategies of regulated utilities.[55] States that allow—or in some cases require—utilities and their regulators to consider future environmental requirements when they make investment decisions have greater ability to plan for a changing regulatory environment.[56] States can also allow PUCs to encourage or require energy efficiency investments that reduce or delay the need for additional generation capacity[57] by approving cost recovery for utility investments in efficiency, and adopting rate designs that remove the inherent incentive for utilities to increase energy sales.[58] Often, PUCs

51. *Id.*

52. ROBERT E. BURNS ET AL., NAT'L REGULATORY RESEARCH INST., NRRI-84-16, THE PRUDENT INVESTMENT TEST IN THE 1980S 79 (1985), *available at* http://www.ipu.msu.edu/library/pdfs/nrri/Burns-Prudent-Investment-Test-84-16-85.pdf.

53. *See, e.g.*, sources cited *infra* notes 231–35, 258 and accompanying text (describing decisions by PUCs in Kentucky and Minnesota to wait for regulatory certainty).

54. *See infra* Part IV.A (describing decisions by PUCs in Indiana, West Virginia, and Mississippi to allow utility investments that take into account future environmental regulations).

55. *See* GORMLEY, JR., *supra* note 5, at 23 ("[L]egislative language establishes the degree of discretion with which regulators make their choices."); *see also* Michael Dworkin et al., *Revisiting the Environmental Duties of Public Utility Commissions*, 7 VT. J. ENVTL. L. 1, 2 (2006) (stating that North Carolina directs its utility commission to "promote harmony between public utilities, their users, and the environment" when making decisions).

56. *See infra* note 87 and accompanying text.

57. S*ee generally* MARILYN A. BROWN ET AL., ENERGY EFFICIENCY IN THE SOUTH (2010), *available at* http://energycodesocean.org/sites/default/files/resources/full_report_efficiency_in_the_south.pdf (providing an analysis of the impact of the implementation of energy efficiency and conservation measures on the need for additional generation capacity); HANNAH CHOI GRANADE ET AL., MCKINSEY & CO., UNLOCKING ENERGY EFFICIENCY IN THE U.S. ECONOMY (2009), *available at* http://www.mckinsey.com/client_service/electric_power_and_natural_gas/latest_thinking/unlocking_energy_efficiency_in_the_us_economy (same).

58. *See, e.g.*, Missouri Energy Efficiency Investment Act, MO. ANN. STAT. § 393.1075 (West 2010) (The Act directs the state utility commission to consider demand-side investments including investments in energy efficiency on par with supply-side investments, permits the utility commission to allow cost recovery for such investment, and gives the commission authority to develop cost

are also responsible for overseeing renewable energy and energy efficiency portfolio standards, which can have important air quality implications for environmental regulators.[59]

Some state legislatures have also established a general, but undefined, obligation for PUCs to consider environmental impacts.[60] For example, in Connecticut the PUC's general purpose is to "[balance] the need for adequate and reliable public utility services at the lowest reasonable cost . . . with the need to protect the environment . . . ."[61] Similarly, the Maryland PUC must "consider the public safety, the economy of the State, the conservation of natural resources, and the preservation of environmental quality,"[62] and the North Carolina PUC must "promote harmony between public utilities, their users, and the environment."[63] PUCs in these states and others with similarly broad language may have an easier time pursuing a coordinated regulatory approach, whereas states with more constrained legislative mandates may need new statutory authority in order to consider the interaction between ratepayer costs and future environmental regulations.[64]

B. State Environmental Regulators

State agencies are often responsible for implementing federal environmental regulations that affect utility operations, such as issuing air and water permits and ensuring compliance with National Ambient Air Quality Standards ("NAAQS").[65] States also influence utility

recovery mechanisms that further encourage energy efficiency investments such as rate design modifications and shared savings incentives.).

59. *See* EPA, GUIDANCE ON STATE IMPLEMENTATION PLAN (SIP) CREDITS FOR EMISSION REDUCTIONS FROM ELECTRIC-SECTOR ENERGY EFFICIENCY AND RENEWABLE ENERGY MEASURES 1 (2004), *available at* http://www.epa.gov/ttn/oarpg/t1/memoranda/ereseerem_gd.pdf (describing the air quality benefits of energy efficiency and renewable energy).

60. *See* Dworkin et al., *supra* note 55, at 1.

61. Public Utility Environmental Standards Act, CONN. GEN. STAT. ANN. § 16-50g (West 2007).

62. MD. CODE ANN., PUB. UTIL. COS. § 2-113(2) (LexisNexis 2010).

63. N.C. GEN. STAT. § 62-2(a)(5) (2011).

64. *See* sources cited *infra* notes 234–37 and accompanying text (describing the Kentucky PSC's determination that it did not have the authority to consider the potential for a state or federal renewable energy mandate).

65. *See* 42 U.S.C. § 7410(a)(1) (2006) (describing the state responsibility for state implementation plans to ensure compliance with NAAQS); *Delegation by Environmental Act,* ENVTL. COUNCIL STS., http://www.ecos.org/section/states/enviro_actlist (last updated Nov. 2010) ("The US EPA is obligated to delegate authority to operate many federal environmental programs to the States who meet the qualifications. Most of the delegable programs are now operated by the States. Delegation usually includes permitting, inspections, monitoring and enforcement, and often includes standards setting.").

investment decisions through their own environmental laws.[66] At the same time, energy investment decisions affect regional air and water quality, global GHG concentration, as well as the cost of meeting federal and state environmental goals.[67] For example, investments in energy efficiency and renewable energy can offset emissions and help states demonstrate that they are on a trajectory to comply with NAAQS.[68]

Consider the Clean Air Act, which—like other major environmental laws that allow or require each state to develop and implement its own environmental programs[69]—provides an active role for state regulators in its implementation. The CAA directs each state to develop a State Implementation Plan ("SIP") to achieve NAAQS set by the EPA.[70] In formulating a SIP, a state is free to determine how to achieve necessary emissions reductions, beyond certain baseline source-specific emissions standards developed by the EPA in other provisions of the CAA.[71] States are also responsible for implementing and enforcing many of the source-specific standards, for example, emissions standards for new and modified stationary sources of conventional[72] and hazardous[73] air

66. *See infra* Part IV.B.2–B.3 (describing North Carolina's Clean Smokestacks Act and Colorado's Clean Air-Clean Jobs Act).

67. S*ee generally* PUB. SERV. COMM'N OF WIS., ENVIRONMENTAL IMPACTS OF POWER PLANTS (n.d.), *available at* http://psc.wi.gov/thelibrary/publications/electric/electric15.pdf (providing an example of the resource-specific impacts).

68. Few states currently take credit for these programs in their State Implementation Plans ("SIPs") because adequately demonstrating air quality improvements is difficult. State utility regulators and state energy offices similarly struggle with evaluation, measurement, and verification of utility- or state-led clean energy programs and state utility regulators in particular struggle to account for these programs in load forecasts and long-term resource planning processes. The EPA recently released a new "Roadmap for Incorporating Energy Efficiency/Renewable Energy Policies and Programs into State and Tribal Implementation Plans," but state utility regulation is one area in particular where the three categories of state agencies could benefit from increased communication and collaboration to share data and harmonize methodologies. *See Incorporating Energy Efficiency/Renewable Energy in State and Tribal Implementation Plans*, EPA, http://www.epa.gov/airquality/eere/ (last visited Jan. 5, 2013).

69. *See*, *e.g.*, Clean Water Act, 33 U.S.C. §§ 1251–1387 (2006); *see also* National Pollutant Discharge Elimination System, 33 U.S.C. § 1342 (2006); Resource Conservation and Recovery Act, 42 U.S.C. § 6901–92 (2006).

70**.** 42 U.S.C. § 7410(a)(1) (2006).

71. Holly Doremus & W. Michael Hanemann, *Of Babies and Bathwater: Why the Clean Air Act's Cooperative Federalism Framework is Useful for Addressing Global Warming,* 50 ARIZ. L. REV. 799, 817 (2008) ("The SIP program leaves many key policy choices to the states . . . [one of which is that] the state decides what reductions to make.").

72. 42 U.S.C. § 7411(c).

73. *Id.* § 7412(l)(1). Whereas the CAA provides for all states to wield primary authority implementing and enforcing New Source Performance Standards ("NSPS"), states must apply to the EPA for primary authority over hazardous air pollutants. *Id.* All states and several territories have been granted primary authority. *See 112 (l) Delegation of Federal Authorities*, EPA, http://www.epa.gov/ttn/atw/112%28l%29/112-lpg.html (last updated June 6, 2012).

pollutants. EPA sets emission standards for new and modified sources at different levels, which vary depending on whether the source is in a geographic area that attains the relevant NAAQS, whether the source is new or modified, and whether the source is considered a major or minor emitter.[74] However, state regulators typically make the final determination as to whether a proposed project (a relevant example being construction of a new power plant) meets a designated emissions limit.[75] In addition, states have particular latitude to regulate existing sources of conventional pollutants for which the EPA has not established a NAAQS.[76] For example, the EPA recently proposed New Source Performance Standards for GHGs for electric generating units.[77] Because there are no NAAQS for GHGs, states will have primary responsibility for regulating GHGs from existing power plants—in accordance with EPA guidelines—under the CAA § 111(d).[78] This forthcoming obligation highlights the importance of considering future environmental regulations during the infrastructure planning process because requirements to limit GHG emissions may significantly impact the operating costs of a fossil fuel-fired power plant.[79]

The pursuit of public health objectives such as clean air and water drives both federal and state environmental standards. In many cases, states have addressed their own public health concerns by establishing environmental requirements for the utility sector that go beyond federal limits. For example, eighteen states adopted mercury emission limits for power plants[80] well before the EPA promulgated the Mercury and Air

74. 42 U.S.C. § 7411(b); *see also New Source Performance Standards and State Implementation Plans*, EPA, http://www.epa.gov/oecaerth/monitoring/programs/caa/newsource.html (last updated June 13, 2012).

75. *State Delegations—Clean Air Act,* ENVTL. COUNCIL STS., http://www.ecos.org/section/states/enviro_actlist/states_enviro_actlist_caa (last visited Jan. 5, 2013) (showing that with few exceptions, most CAA permitting programs are delegated to state agencies); *see also Operating Permits,* EPA, http://www.epa.gov/airquality/permits/ (last visited Jan. 5, 2013) (stating that most Title V permits are issued by state and local permitting authorities).

76. 42 U.S.C. § 7411(d).

77. Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units, 77 Fed. Reg. 22,392 (proposed Apr. 13, 2012) (to be codified at 40 C.F.R. pt. 60).

78. Jonas Monast et al., *Regulating Greenhouse Gas Emissions from Existing Sources: Section 111(d) and State Equivalency*, 42 ENVTL. L. REP. 10,206, 10,206 (2012).

79. *See, e.g.*, John Davison, *Performance and Costs of Power Plants with Capture and Storage of CO_2,* 32 ENERGY 1163, 1172 (2007) (comparing the costs of fossil fuel-fired power plants that capture carbon dioxide to conventional coal and natural gas plants without capture).

80. MCCARTHY, *supra* note 20, at 2.

Toxics Standards ("Utility MATS") rule for coal- and oil-fired power plants in February 2012.[81]

While state environmental regulators typically decide whether to issue a permit by narrowly assessing whether the project meets the applicable federal or state requirement,[82] considering the energy, environmental, and consumer protection impacts of each decision may reveal additional opportunities to simultaneously address multiple state goals. For example, investments in pollution controls, energy efficiency, and clean generation technologies may offset other state and consumer health costs by, for example, reducing visits to the emergency room or the number of sick days taken by workers—an impact that state regulators do not explicitly consider during the permitting process.[83] This broader view of the regulatory goals, in conjunction with direct coordination with PUCs, could allow environmental regulators to both protect public health and help ensure that electricity infrastructure decisions within a state are likely to result in affordable rates over the lifetime of the facility.

C. State Energy Offices

States also affect utility decisions by setting broad energy policy goals that support the public interest. Often, states charge a third state agency, the state energy office, with administering incentive programs to support these goals.[84] In many states the energy office is part of the commerce department, reflecting a broad desire to support economic development through energy choices.[85] For example, an energy office may offer incentives for residents and businesses to invest in energy efficiency or renewable energy (supporting local jobs in these industries), it may recommend energy policies to the state,[86] and it may have a significant

81. *See generally* Mercury and Air Toxics Standards, 77 Fed. Reg. 9304, 9367–70 (Feb, 16, 2012) (to be codified at 40 C.F.R. pts. 60, 63).

82. *See Operating Permits—Basic Information*, EPA, http://www.epa.gov/airquality/permits /basic.html (last visited Jan. 5, 2013) (stating that permits include pollution control requirements from federal or state regulations that apply to a source and that most are issued by state or local permitting authorities).

83. Chikkatur et al., *supra* note 17, at 109–13 (describing the costs of pollution to society, including healthcare costs, hospital visits, and sick days).

84. *See About Us*, *supra* note 7.

85. For example, Illinois, North Carolina, North Dakota, Oklahoma, and Washington have an energy office in their commerce department. In Florida, the energy office is part of the Department of Agriculture and Consumer Services. *See NASEO State and Territory Energy Office Members,* NAT'L ASS'N ST. ENERGY OFFICIALS, http://www.naseo.org/members/states/ default.aspx (last visited Jan. 5, 2013) (information regarding each state may be accessed by choosing from the dropdown menu).

86. *See, e.g.*, *Energy Portfolio*, ST. COLO., http://www.colorado.gov/energy/ (follow "Energy Portfolio" hyperlink), (last visited Jan. 5, 2013) ("The CEO has recommended the development of an

role in designing renewable portfolio standards that require utilities to generate (or purchase) a set amount of energy from renewable sources, even if they are not the least-cost option in the near term.[87]

The types of programs that state energy offices frequently oversee interact with the consumer protection and environmental protection goals of state PUCs and environmental agencies. For example, state renewable energy tax credits encourage utilities and independent power producers to invest in renewable energy facilities, and encourage consumers to invest in distributed renewable energy projects.[88] In the long term, investment in renewable energy resources such as wind and solar (resources that do not depend on fuel inputs), can help utilities hedge against price increases that may result from new environmental regulations or increased fuel costs.[89] State policies that encourage energy efficiency mitigate demand growth and delay the need for new capital investments, which allows utilities to wait for more information before making additional generation investments.[90] On the demand side, policies that improve energy efficiency include building codes, appliance standards, and incentive programs that encourage consumers to adopt more efficient technologies.[91] Increasing end-use energy efficiency also insulates consumers from rate increases resulting from increases in fuel costs or capital investments in new power plants.[92]

energy policy for the State of Colorado, creating a 'Balanced Energy Portfolio,' the details of which will be developed by the CEO through an extensive, analytical stakeholder process to guide our cost-benefit analysis to determine the energy vision for the State's electric power generation mix, and to inform the Administration on what policy tools and pathways will most effectively and efficiently lead us to this vision.").

87. *See Renewable Portfolio Standards Fact Sheet*, EPA, http://www.epa.gov/chp/state-policy/renewable_fs.html (last visited Jan. 5, 2013) (describing the design and benefits of renewable portfolio standards and indicating states that have these requirements).

88. Frederick C. Menz, *Green Electricity Policies in the United States: Case Study,* 33 ENERGY POL'Y 1398, 2402–05 (2005) (describing state incentive programs to encourage renewable energy).

89. *See generally* MARK BOLINGER ET AL., ERNEST ORLANDO LAWRENCE BERKELEY NAT'L LAB., QUANTIFYING THE VALUE THAT WIND POWER PROVIDES AS A HEDGE AGAINST VOLATILE NATURAL GAS PRICES (2002), *available at* http://eetd.lbl.gov/ea/EMS/reports/50484.pdf.

90. *See* BINZ ET AL., *supra* note 14, at 15, 42 (describing large capital investment needs and the role of energy efficiency as a substitute for capital investment).

91. ELIZABETH DORIS ET AL., NAT'L RENEWABLE ENERGY LAB., NREL/TP-6A2-46532, ENERGY EFFICIENCY POLICY IN THE UNITED STATES: OVERVIEW OF TRENDS AT DIFFERENT LEVELS OF GOVERNMENT 1 (2009), *available at* http://www.nrel.gov/docs/fy10osti/46532.pdf.

92. RACHEL YOUNG ET AL., AM. COUNCIL FOR AN ENERGY-EFFICIENT ECON., SAVING MONEY AND REDUCING RISK: HOW ENERGY EFFICIENCY ENHANCES THE BENEFITS OF THE NATURAL GAS BOOM 11 (2012) ("Energy efficiency reduces a utility's [and therefore ratepayers'] exposure to fuel volatility" and "energy efficiency benefits all ratepayers by helping to avoid new power plant costs.").

Because state energy offices typically serve to develop policy and administer incentives rather than evaluate and enforce facility-specific activities,[93] they could play an important role coordinating state energy, environmental, and consumer protection goals. Energy offices could evaluate their state's energy regulatory structure, identifying opportunities for information sharing and improving policy consistency. With their role in policy development, energy offices are also well positioned to incite change in states where increasing coordination would require new or expanded authority for one or more of the agencies involved.

III. INVESTING TRILLIONS UNDER REGULATORY UNCERTAINTY

A. The Scale of Upcoming Investments in the Electric Utility Sector

Today, it is especially important for the state entities described above to think critically about the intersection of utility planning, consumer protection, and environmental protection. Approximately seventy percent of the United States' coal-fired power plants are now at least thirty years old, and many are nearing the end of their useful life.[94] The U.S. Energy Information Administration predicts that power plant owners and operators will retire twenty-seven gigawatts of electricity generating capacity between 2012 and 2016, representing 8.5% of total 2011 capacity.[95] Factors driving these retirements include an aging fleet of coal-fired power plants, inexpensive natural gas prices,[96] and new and impending environmental regulations for criteria air pollutants, hazardous air pollutants, coal ash, and cooling water that will heavily burden older, less efficient power plants.[97]

Regardless of the cause, the TBL framework proposed here allows utility regulators to look ahead as they consider new infrastructure decisions, and hedge against future uncertainties, including the cost of

93. *See, e.g.*, Utah State Energy Amendments, H.B. 475, 2011 Leg., Gen. Sess. (2011) (enumerating the roles of the newly established Utah Office of Energy Development including to "develop and implement policy").

94. *See infra* note 180 and accompanying text (describing the age of the U.S. coal-fired power fleet and typical life-span of a coal-fired power plant).

95. *27 gigawatts of coal-fired capacity to retire over next five years*, *supra* note 1.

96. *See* SUSAN F. TIERNEY, ANALYSIS GRP. INC., WHY COAL PLANTS RETIRE: POWER MARKET FUNDAMENTALS AS OF 2012, at 2 (2012), *available at* http://www.analysisgroup.com /uploadedFiles/News_and_Events/News/2012_Tierney_WhyCoalPlantsRetire.pdf.

97. *Id.* While this paper focuses on the interaction between environmental regulation and electric generation cost and reliability, it is important to note that low natural gas prices are driving retirements of older coal-fired power plants at least as much as new environmental regulations, perhaps more.

compliance with likely future environmental regulations. Utilities and utility commissions have assessed fuel price volatility in their long-term planning processes for decades[98] (though current low natural gas prices are the result of an unexpected boom in domestic production from abundant but unconventional sources).[99] In some ways, environmental regulations are easier to predict. Environmental requirements have generally grown more stringent over time. The key variables utilities and regulators must account for are stringency, timing, and cost.[100] Fuel prices, on the other hand, vary based on supply, demand, and access to international markets.[101] Yet the predominant approach to utility regulation today focuses on the costs of complying with existing environmental regulation, making it difficult for utilities and regulators to plan for, and hedge against, uncertainties related to future environmental compliance costs.[102]

To replace retiring plants and address future electricity demand, the electric utility sector faces both large investment needs—estimated in the range of $1.5 to $2 trillion over the next twenty years[103]—and significant risk associated with future environmental standards that will affect both electricity prices and environmental impacts for decades.[104] Utility regulators that are sensitive to short-term rate impacts and rely primarily on retrospective prudency reviews may forgo investments aimed at

98. Karl Bokenkamp et al., *Hedging Carbon Risk: Protecting Customers and Shareholders from the Financial Risk Associated with Carbon Dioxide Emissions*, 18 ELECTRICITY J., July 2005, at 6, 11.

99. *See* KEN COSTELLO, NAT'L REGULATORY RESEARCH INST., HYDRAULIC FRACTURING: PLACING WHAT WE KNOW TODAY IN PERSPECTIVE 6 (2011), *available at* http://www.nrri.org/pubs/gas/NRRI_Hydraulic_Fracturing_Oct11-16.pdf (describing how technological advances in hydraulic fracturing have enabled low natural gas prices and uncertainty that utility regulators face with regard to the cost of natural gas fuel in the long run).

100. PAUL J. MILLER, NE. STATES FOR COORDINATED AIR USE MGMT., A PRIMER ON PENDING ENVIRONMENTAL REGULATIONS AND THEIR POTENTIAL IMPACTS ON ELECTRIC SYSTEM RELIABILITY 2 (2011), *available at* http://www.nescaum.org/documents/primer-on-epa-reg-impacts-20130109-update.pdf/ (describing the relative certainty that the EPA will issue a host of environmental regulations and uncertainty regarding timing and stringency).

101. BINZ ET AL., *supra* note 14, at 30 (describing fuel price risk).

102. *Id.*

103. CHUPKA ET AL., *supra* note 2, at xiv; U.S. ENERGY INFO. ADMIN., DOE/EIA-0383(2012), ANNUAL ENERGY OUTLOOK 2012 WITH PROJECTIONS TO 2035, at 86 (2012), *available at* http://www.eia.gov/forecasts/aeo/pdf/0383(2012).pdf ("Electricity demand grows by 22 % in the *AEO2012* Reference case, from 3,877 billion kilowatt hours in 2010 to 4,716 billion kilowatt hours in 2035.").

104. Andrews & Govil, *supra* note 13, at 885.

hedging the risk of future environmental regulations, even if future rules seem likely.[105]

B. Considering Regulatory Uncertainty in the Planning Process

Protecting public health and the environment is an evolving process, with laws and regulations requiring more stringent emissions limits as new scientific knowledge and pollution control technologies develop.[106] Considering the likelihood and the impacts of increasingly stringent limitations is an important element of maintaining affordable and reliable electricity.[107]

Over the life of a power plant, new requirements to control conventional pollutants are likely to raise the operating costs of a coal-fired power plant even if it is built with the best available pollution controls at the time of construction. For example, the Kentucky PUC recently approved a $1.4 billion plan to remove four first generation flue gas desulfurization systems from existing coal units, and construct new flue gas desulfurization and particulate matter control systems to comply with CSAPR,[108] the Utility MATS rule, and the new one-hour sulfur dioxide NAAQS.[109] In June 2012, South Carolina Electric and Gas Company ("SCE&G") similarly requested a rate increase to recoup more than $300 million the company invested in a flue gas desulfurization system at the Wateree Station coal-fired power plant and other environmental upgrades to "comply with increasingly stringent [federal]

105. *Id.* at 890 (describing how the traditional system of economic regulation punishes utilities for proactive environmental investments if they are wrong about future rules, and does not reward them if they are right, thereby discouraging proactive investments and leading to inefficient long term pollution control strategies).

106. *See, e.g.*, *infra* note 130 and accompanying text.

107. N. AM. ELEC. RELIABILITY CORP., 2011 LONG-TERM RELIABILITY ASSESSMENT 127 (2011), *available* at http://www.nerc.com/files/2011LTRA_Final.pdf ("[I]mplementation (of EPA regulations) will place demands on the equipment and construction sectors since multiple EPA programs will be phased in over the same time frame. This situation is compounded by [the fact that] a significant number of electric generation units . . . are likely to retrofit environmental controls, and there will be competition created by replacement generation capacity projects and other heavy U.S. infrastructure projects in other sectors. Costs could escalate beyond the assumed compliance costs, should the EPA require compliance within three years of the final rulemaking dates.").

108. Cross-State Air Pollution Rule, 76 Fed. Reg. 48,208, 48,208 (codified at 40 C.F.R. pts. 51, 52, 72, 78, 97).

109. *See* Application of Louisville Gas & Elec. Co. For Certificates of Pub. Convenience & Necessity and Approval of its 2011 Compliance Plan For Recovery by Envtl. Surcharge, No. 2011-00162 (Ky. Pub. Serv. Comm'n Dec. 15, 2011), *available at* http://psc.ky.gov/order_vault/Orders_2011/201100162_12152011.pdf.

environmental laws and regulations."[110] SCE&G spent an additional $190 million between 2001 and 2006 to install fly ash controls, nitrogen oxide controls, and a closed-cooling water system at the Wateree facility, which began commercial operation in 1970.[111]

Each of these investments may appear cost-effective when viewed in the light of current regulatory requirements, other recent capital investments in the facilities, and projected electricity demand. But had the regulatory process also considered the potential for additional environmental requirements—such as a future price on GHG emissions, changes to cooling water requirements, or coal ash disposal rules—the calculation may have turned out differently.[112] For example, it may have

110. Application at 4, Application of S.C. Elec. & Gas Co. for Adjustments in the Co.'s Elec. Rate Schedules & Tariffs & Request for Mid-Period Reduction in Base Rates for Fuel, No. 2012-218-E (June 29, 2012), *available at* http://www.scana.com/NR/rdonlyres/31D5227A-C768-4969-8D27-24FA97365E72/0/2012RateCaseApplication62912.pdf.

111. *Wateree Station*, S.C. ELECTRIC & GAS COMPANY, http://www.sceg.com/en/about-sceg/power-plants/fossil-fired/wateree-station (last visited Jan. 5, 2013).

112. South Carolina does not grant pre-approval for environmental retrofits or provide cost recovery for retrofits directed at complying with prospective regulations. Telephone interview with Dr. James Spearman, Senior Technical Advisor, S.C. Pub. Serv. Comm'n (Oct. 8, 2012). SCE&G's requests for rate recovery of environmental retrofits at Wateree Station do not address plant-specific long-term environmental compliance costs beyond those directly related to the specific retrofit under consideration for inclusion in rates. *See, e.g.*, Petition of S.C. Elec. & Gas Co., No. 2008-393-E (S.C. Pub. Serv. Comm'n Oct. 28, 2008), *available at* http://dms.psc.sc.gov/pdf/orders/4E8FB477-D0F1-1F4A-C3D1F6B66375EEF9.pdf (order granting request for an accounting order); Application of S.C. Elec. & Gas Co. for Adjustments & Increases in the Co.'s Elec. Rate Schedules & Tariffs, No. 2007-229-E (S.C. Pub. Serv. Comm'n Dec. 14, 2007), *available at* http://dms.psc.sc.gov/pdf/orders/D99F8C7E-B773-257F-BF18CF4490D4815B.pdf (final order); Application of S.C. Elec. & Gas Co. For Adjustments & Increases in Its Elec. Rate Schedules & Tariffs, No. 2004-178-E (S.C. Pub. Serv. Comm'n Jan. 5, 2005), *available at* http://dms.psc.sc.gov/pdf/orders/4DB74F70-0E91-F9ED-0DC26228E5A6A520.pdf (order granting adjustments of rates and tariffs); Direct Testimony of Stephen A. Bryne on Behalf of South Carolina Electric & Gas Company, Application of S.C. Elec. & Gas Co. For Adjustments & Increases in Its Elec. Rate Schedules & Tariffs, No. 2007-229-E (S.C. Pub. Serv. Comm'n July 27, 2007), *available at* http://dms.psc.sc.gov/pdf/matters/17168CE1-9C8F-3DC4-8FB01A26A096ADDE.pdf. In addition, SCE&G's most recent integrated resource plan ("IRP") includes a long-run analysis and determines the economical disposition of six coal plants under *existing* environmental regulations. *See* S.C. ELEC. & GAS CO., 2012 INTEGRATED RESOURCE PLAN 27–38 (2012), *available at* http://dms.psc.sc.gov/pdf/matters/2DCA402C-155D-2817-105199D59D8C3291.pdf (detailing the electric and gas company's resource plan submitted to South Carolina Public Utility Commission). While the IRP also summarizes proposed environmental regulations, including those governing cooling water and coal ash, the economic analysis only considers existing rules. *Id. at* 19–22. As discussed above, a post-hoc analysis of the Kentucky retrofit decision found that the retrofits are cost-effective across a number of scenarios regarding potential rules governing coal ash, cooling water, and greenhouse gas regulations. However, the analysis suggests that retirement and replacement may be cost-effective if the plant faces a GHG price in the future. *See* Direct Testimony of Karen T. Hyde on Behalf of Public Service Company of Colorado at 30–31, Comm'n Consideration of Pub. Serv. Co. of Colo. Plan in Compliance with House Bill 10-1365,

favored retirement and replacement with a cleaner generation source. Depending on assumptions about GHG prices and other environmental rules, the economics for a specific power plant may change drastically.[113] In contrast, the TBL approach detailed in Parts VII and VIII would allow regulators to make more informed decisions in the face of regulatory uncertainty by establishing a process for PUC regulators and environmental regulators to explore the potential for new regulations and consider the cost-effective strategies for long-term compliance.

Although it is not possible for regulators or commissioners to predict the specific requirements of future regulations, a federal rulemaking process typically takes multiple years or even decades.[114] It is prudent, therefore, for PUCs and environmental regulators to consider past and current rulemaking trends and take measures to facilitate utility planning to anticipate likely new requirements.

The CAA provides a particularly timely example of the trend toward greater regulatory stringency, as the EPA has issued a number of rules affecting the utility sector using its power under the CAA.[115] Three prominent examples have received significant attention due to their impacts on electric utilities: (1) increasing stringency for NAAQSs; (2) a new rule governing emissions of Hazardous Air Pollutants ("HAPs") from power plants; and (3) the development of NSPS for GHG emissions.[116] While the NAAQS, HAPs, and NSPS programs offer a variety of implementation timelines and procedures for updating standards, the structure of the CAA generally requires periodic review, and when appropriate to protect public health and the environment, it requires revision of air quality standards and performance standards for

"Clean Air-Clean Jobs Act", No. 10M-245E (Colo. Pub. Serv. Comm'n Nov. 22, 2010), *available at* https://www.dora.state.co.us/pls/efi/efi_p2_v2_demo.show_document?p_dms_document_id=62737&p_session_id= ("[T]he problem with [a piecemeal approach to addressing multiple forthcoming environmental regulations] is that it could lead to unit by unit controls on coal units that would later need additional or different controls, or that ultimately would need to be retired to meet later standards despite the investment to comply with earlier standards.").

113. *See generally* Peter S. Reinelt & David W. Keith, *Carbon Capture Retrofits and the Cost of Regulatory Uncertainty,* 28 ENERGY J. 101, 101–103 (2007) (describing how the relative costs of different fossil fuel generation technologies vary depending on the need for carbon capture and storage).

114. *See, e.g.*, WORLD RES. INST., WRI FACTSHEET: RESPONSE TO EEI'S TIMELINE OF ENVIRONMENTAL REGULATIONS 4 tbl.1 (2010), *available at* http://pdf.wri.org/factsheets/factsheet_response_to_eei_timeline.pdf.

115. *See* PAUL J. MILLER, NE. STATES FOR COORDINATED AIR USE MGMT., A PRIMER ON PENDING ENVIRONMENTAL REGULATIONS AND THEIR POTENTIAL IMPACTS ON ELECTRIC SYSTEM RELIABILITY 2–10 (2012), *available at* http://www.nescaum.org/items-of-interest (providing an overview of upcoming and recently completed regulations affecting the utility sector).

116. *See id.*

regulated sources.[117] Particularly important to the intersection between environmental protection and electricity rates, these Sections can lead to new rules that apply to *existing* power plants.[118] Tightening emission limits for existing facilities can be especially costly compared to integrating pollution controls into new construction or major modifications.[119] For example, applying new pollution controls to an existing plant may require additional construction to accommodate new equipment.[120] Whereas new power plants or major modifications can be designed with equipment in place or leave space to install pollution controls in the future.[121]

Understanding the statutory mandates, the environmental concerns, and the range of regulatory options under consideration will allow state-level regulators and PUCs to better evaluate potential impacts of an infrastructure investment on electricity prices, reliability, and impacts on public health and the environment. To that end, utilities regularly assess fuel price scenarios and plan infrastructure around the modeling results.[122] The political and regulatory processes are more difficult to predict, leading utilities and PUCs to delay investments until there is sufficient policy certainty to ensure that the investment is necessary and will meet the new standards.[123] However, considering regulatory trends can help PUCs take a broader view of what qualifies as prudent investments—potentially allowing regulatory risk to play a more concrete role in the utility planning process. This section provides an overview of the historic implementation of the CAA provisions that most strongly affect operations at existing facilities. The trends suggest that utilities can expect to face greater stringency over time and that the additional regulatory requirements will likely impact electricity generation in the future.

117. 42 U.S.C. § 7409 (2006).

118. *Id.* §§ 7409, 7410.

119. *See* U.S. DEP'T OF ENERGY, REPORT OF THE INTERAGENCY TASK FORCE ON CARBON CAPTURE AND STORAGE 34–35 (2010), *available at* http://www.fe.doe.gov/programs/sequestration/ccstf/CCSTaskForceReport2010.pdf. For example, size and space requirements for carbon dioxide capture equipment are likely to make carbon capture and storage ("CCS") retrofits challenging and more costly than CCS installations at new plants that are built to accommodate CCS. *Id.*

120. *See id.*

121. *See id.*

122. *See infra* Part IV.B.4.

123. *See infra* Parts IV.A, IV.B.1 (describing actions by PUCs in Kentucky and Minnesota that declined to approve investments under uncertainty surrounding renewable energy policy and EPA mercury regulation).

1. National Ambient Air Quality Standards

The NAAQS program provides a clear example of a regulatory process that continues to evolve toward more stringent requirements as science and technology advance. As one of the central components of the CAA, the EPA establishes a series of NAAQS governing allowable concentrations of certain "criteria" pollutants in the atmosphere.[124] Criteria pollutants are pollutants that "cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare . . . [and] the presence of which in the ambient air results from numerous or diverse mobile or stationary sources . . . ."[125] The CAA requires the EPA to review each standard every five years to ensure that they are adequate to protect public health and welfare.[126] These reviews have led the EPA to revise individual air quality standards on numerous occasions.[127]

In the near term, the EPA is likely to adopt a more stringent NAAQS for ozone to reflect the EPA's latest scientific analysis. The current ozone standard of 0.075ppm,[128] which the EPA adopted in 2008, is more stringent than the previous standard of 0.08 ppm.[129] However, it is substantially higher than the standard recommended by the EPA's own scientific advisors, who recommended a standard between 0.060 and 0.070 ppm.[130] The EPA attempted to revise the standard in 2011, calling the 2008 departure from agency science "indefensible."[131] In September 2011, the EPA announced that it would postpone reconsideration of the ozone standard until 2013.[132] The EPA has also recently issued a more

124. *National Ambient Air Quality Standards (NAAQS)*, EPA, http://www.epa.gov/air/criteria.html (last updated Dec. 14, 2012) (listing criteria pollutants, including sulfur dioxide, nitrogen oxides, particulate matter, ozone, carbon monoxide, and lead).

125. 42 U.S.C. §§ 7408(a)(1)(A)–(B) (2006).

126. *Id.* § 7409(d).

127. For example, the EPA has revised the ozone NAAQS five times. *Ozone (O_3) Standards—Table of Historical Ozone NAAQS*, EPA, http://www.epa.gov/ttn/naaqs/standards/ozone/s_o3_history.html (last updated Oct. 6, 2012).

128. National Ambient Air Quality Standards for Ozone, 73 Fed. Reg. 16,436, 16,483 (Mar. 27, 2008) (codified at 40 C.F.R. 50, 58).

129. National Ambient Air Quality Standards for Ozone, 62 Fed. Reg. 38,856 (July 18, 1997) (no longer in force).

130. CLEAN AIR SCI. ADVISORY COMM., EPA-CASAC-11-004, CASAC CONSENSUS RESPONSES TO CHARGED QUESTIONS 1–3 (2011), *available at* http://yosemite.epa.gov/sab/sabproduct.nsf/F08BEB48C1139E2A8525785E006909AC/$File/EPA-CASAC-11-004-unsigned%2B.pdf.

131. Letter from Lisa Jackson, Adm'r, EPA, to Tom Carper, Senator, U.S. Senate (July 13, 2011) (on file with author).

132. Press Release, White House Office of the Press Sec'y, Statement by the President on the Ozone National Ambient Air Quality Standards (Sept. 2, 2011), *available at* http://www.whitehouse.gov/the-press-office/2011/09/02/statement-president-ozone-national-

stringent NAAQS for particulate matter in response to a growing body of scientific evidence suggesting that the previous standard did not adequately protect human health.[133]

While the NAAQS establish the maximum allowable concentrations of criteria pollutants, the standards are not directly enforceable against individual sources. Rather, the states implement the standards through emission limits for specific sources pegged to reductions achievable through available technology.[134] Individual facilities are subject to different degrees of emissions control according to statewide NAAQS compliance. Air quality permits for power plants and other large sources of pollution generally include technology requirements, but these requirements differ depending on whether an area is in compliance or out of compliance with a NAAQS.[135] Under both standards, environmental regulators, typically at the state or local level, determine the applicable technology requirements for new and modified sources on a case-by-case basis.[136]

Among other requirements, Section 110 of the CAA contains a "good neighbor" provision, which requires that state implementation plans ("SIPs") ensure that emissions from one state do not interfere with

ambient-air-quality-standards. While political pressure may delay implementation of a new ozone standard, it is likely that the EPA will implement a new NAAQS within the level recommended by the EPA's scientists, either as a result of the EPA's initiative or by court order. The D.C. Circuit has previously held that the EPA's failure to consider its own science in rulemaking is invalid as arbitrary and capricious and, because of the EPA's failure to consider the recommendations of agency scientists, the 2008 NAAQS could suffer the same fate, forcing the agency to act. *See* Chlorine Chemistry Council v. EPA, 206 F.3d 1286, 1290 (D.C. Cir. 2000) (vacating EPA water quality standards where the agency established limits for chloroform in drinking water at zero despite scientific evidence that low amounts of chloroform were not dangerous); *see also* Am. Horse Prot. Ass'n v. Lyng, 812 F.2d 1, 7 (D.C. Cir. 1987) (holding that the Secretary of Agriculture's failure to implement rules banning the use of certain equestrian equipment in the face of clear scientific support for a ban was arbitrary and capricious).

133. Regional Haze: Revisions to Provisions Governing Alternatives to Source-Specific Best Available Retrofit Technology (BART) Determinations, Limited SIP Disapprovals, and Federal Implementation Plans, 76 Fed. Reg. 82,219 (proposed Dec. 30, 2011) (to be codified at 40 C.F.R. pts. 51, 52).

134. 42 U.S.C. § 7410(a) (2006). In some circumstances, the EPA will implement a federal implementation plan when a state opts not to develop a SIP, or when the Agency determines that a SIP is inadequate to comply with a NAAQS. *Id.* § 7410(c).

135. *Id.* §§ 4207, 7475, 7503. In NAAQS-compliant states ("in attainment"), covered sources must satisfy an emissions rate based on best achievable control technology ("BACT"). *Id.* §§ 7475, 7479. However, facilities located in non-attainment areas are subject to a more stringent standard, the lowest achievable emissions rate ("LAER"). *Id.* § 7503(a)(2).

136. Richard L. Revesz & Allison L. Westfahl Kong, *Regulatory Change and Optimal Transition Relief*, 105 NW. U. L. REV. 1581, 1599 (2011); *see also New Source Review Where You Live*, EPA, http://www.epa.gov/nsr/where.html (last updated July 22, 2011) (stating that most new source review permits are issued by state and local permitting authorities).

NAAQS compliance in other states.[137] The EPA's efforts to enforce this provision—starting with the 1998 nitrogen oxide SIP Call[138]—have focused primarily on the electric power sector. Even though regulation under Section 110 has progressed through a number of iterations and is still undergoing review, utilities have been on notice since late 2003—when the EPA announced the Clean Air Interstate Rule ("CAIR")—that the EPA intends to finalize a comprehensive plan to limit interstate transmission of pollutants.[139]

The EPA designed CAIR to limit interstate transport of nitrogen oxide and sulfur dioxide emissions, the chemical precursors of ozone and fine particulate matter, both criteria pollutants.[140] Specifically, CAIR required certain upwind states to revise their SIPs to include additional limitations on the pollutants.[141] In 2008, the D.C. Circuit overturned CAIR for failing to properly consider the actual contributions of individual states to downwind non-attainment.[142] Three years later, the EPA replaced CAIR with the Cross-State Air Pollution Rule ("CSAPR"), which again called for limitations on emissions of nitrogen oxide and sulfur dioxide.[143] In August 2012, the D.C. Circuit vacated CSAPR, further delaying policy certainty regarding the "good neighbor" provisions of the CAA.[144] In its place, the court required the temporary continuation of CAIR.[145] While the fate of CSAPR remains undecided,[146] the EPA's continued attempts to regulate the interstate transport of emissions and the D.C. Circuit's decision to allow the

137. 42 U.S.C § 7410(a)(2)(D)(i)(I) (2006).

138. EPA established the NO_x Budget Trading Program under the NO_x State Implementation Plan, also known as the "NO_x SIP Call." The NO_x Budget Trading Program ("NBP") was a market-based cap and trade program created to reduce emissions of nitrogen oxides from power plants and other large combustion sources in the eastern United States. *See* Finding of Significant Contribution and Rulemaking for Certain States in the Ozone Transport Assessment Group Region for Purposes of Reducing Regional Transport of Ozone, 63 Fed. Reg. 57,356, 57,358–59 (Oct. 27, 1998) (codified at C.F.R. pts. 51, 72, 75, 96).

139. Press Release, EPA, Clean Air Proposals Promise Sharp Power Plant Pollution Reductions (Dec. 15, 2003), *available at* http://yosemite.epa.gov/opa/admpress.nsf/e013d28c3c3eb28b85257359003d480b/b8860b2d46c43fa385256dfd007870df!OpenDocument.

140. Clean Air Interstate Rule, 70 Fed. Reg. 25,162, 25,162 (May 12, 2005) (codified at 40 C.F.R. pts. 51, 72, 73, 74, 78, 96).

141. *Id.*

142. North Carolina v. EPA, 531 F.3d 896, 908 (D.C. Cir. 2008) (per curiam).

143. Cross-State Air Pollution Rule, 76 Fed. Reg. 48,208, 48,208 (codified at 40 C.F.R. pts. 51, 52, 72, 78, 97)

144. EME Homer City Generation, L.P. v. EPA, 696 F.3d 7, 12 (D.C. Cir. 2012).

145. *Id.*

146. EPA has requested *en banc* review of the CSAPR decision. *See* Petition for Rehearing En Banc, EME Homer City Generation, L.P. v. EPA, 696 F.3d 7 (D.C. Cir. 2012) (No. 11-1302), 2012 WL 4748805.

temporary administration of CAIR signal a commitment to such regulation.

NAAQS implementation underscores both the need to understand the overall trajectory of environmental regulations and the difficulty of predicting when and how regulations will affect the electric power sector. Because NAAQS revisions can apply to existing facilities (as opposed to only new construction or major modifications),[147] either the increased stringency of individual NAAQS or revision of the "good neighbor" provisions could have a direct impact on fossil fuel-fired power plants, potentially leading to the installation of costly new pollution control equipment or the retirement of certain plants.[148]

2. Hazardous Air Pollutants

Section 112 of the CAA authorizes the EPA to regulate HAP emissions.[149] HAPs are particularly dangerous pollutants including, but not limited to, those that are "carcinogenic, mutagenic, teratogenic, neurotoxic, which cause reproductive dysfunction, or which are acutely or chronically toxic."[150] Given their potential to cause acute health problems, HAPs are subject to the highest technology-based standard possible: maximum achievable control technology ("MACT"). MACT standards represent the "[m]aximum degree of reduction in emissions of the hazardous air pollutants . . . that the [EPA] Administrator, taking into consideration the cost of achieving such emission reduction, and any non-air quality health and environmental impacts and energy requirements, determines is achievable for new or existing sources . . . ."[151] Section 112 further directs the EPA to review and revise these MACT standards at least every eight years.[152] Where improved emissions reduction technologies become available, MACT standards are likely to be revised to reflect those changes, making new and modified conventional power generating units more expensive to operate.

147. *See* 42 U.S.C. § 7410(a)(1) (2006) (The Clean Air Act grants states flexibility in achieving NAAQS, which can include reducing emissions from existing sources).

148. *See* THE BRATTLE GRP., POTENTIAL COAL PLANT RETIREMENTS AND RETROFITS UNDER EMERGING ENVIRONMENTAL REGULATIONS 18 (2011), *available at* http://www.brattle.com/_documents/UploadLibrary/Upload981.pdf (projecting total capital expenditures for coal plants to comply with the MATS Rule and the court-vacated CSAPR of $70–130 billion by 2020).

149. 42 U.S.C. § 7412 (2006).

150. *Id.* § 7412(b)(2).

151. *Id.* § 7412(d)(2).

152. *Id.* § 7412(c)(1).

Emissions limits for mercury in particular have long been in the regulatory pipeline,[153] providing notice to state regulators that power plants would very likely face HAP limits, and exemplifying the difficulty of predicting the timing and stringency of an emissions limitation. The EPA has had the obligation and authority to regulate HAPs since the passage of the CAA in 1970.[154] The 1990 CAA Amendments further included a list of 188 distinct pollutants that created a high likelihood of adverse human health effects, including mercury.[155] However, it would be another twenty years before the EPA released comprehensive limits for mercury emissions from coal-fired power plants in December 2011.[156]

Despite the long rule development process, there were reliable indications that the electric power sector would face limitations on emissions of HAPs. As a prelude to the regulation of mercury under the HAPs rules, the 1990 CAA Amendments required the EPA to determine whether it was "appropriate and necessary" to regulate mercury emissions from the power sector.[157] The EPA under the Clinton Administration completed its studies of mercury emissions from power plants in 2000, concluding that regulating mercury from fossil fuel-fired power plants was "appropriate and necessary."[158] Under the Bush Administration, the EPA subsequently delisted mercury as a hazardous air pollutant and sought to limit it through a trading program rather than regulating it as a HAP.[159] The EPA enacted the Clean Air Mercury Rule ("CAMR") in 2005, seeking to avoid the increased costs to utilities associated with employing MACT.[160] However, a number of states brought suit against the administration, arguing that the administration

153. Keith Harley, *Mercurial but Not Swift: US EPA's Initiative to Regulate Coal Plant Mercury Emissions Changes Course as it Enters a Third Decade*, 86 CHI.-KENT L. REV. 277, 277 (2011).

154. Act of Dec. 31, 1970, Pub. L. No. 91-604, 84 Stat. 1676 (amending the Clean Air Act to improve U.S. air quality standards).

155. 42 U.S.C. § 7412(b).

156. National Emission Standards for Hazardous Air Pollutants From Coal- and Oil-Fired Electric Utility Steam Generating Units and Standards of Performance for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial-Institutional, and Small Industrial-Commercial-Institutional Steam Generating Units, 77 Fed. Reg. 9304, 9367 (Feb. 16, 2012) (to be codified at 40 C.F.R. pts. 60, 63).

157. 42 U.S.C. § 7412(n)(1)(A)–(C).

158. Regulatory Finding on the Emissions of Hazardous Air Pollutants from Electric Utility Steam Generating Units, 65 Fed. Reg. 79,825, 79,830 (Dec. 20, 2000).

159. Revision of December 2000 Regulatory Finding on the Emissions of Hazardous Air Pollutants From Electric Utility Steam Generating Units and the Removal of Coal- and Oil-Fired Electric Utility Steam Generating Units From the Section 112(c) List, 70 Fed. Reg. 15,994, 16,002–03 (Mar. 29, 2005) (codified at 40 C.F.R. pt. 63).

160. *Id.* at 15,999 (noting the extremely high costs that electric utilities will face) (quotation marks omitted).

did not provide sufficient justification for its delisting of mercury.[161] In a 2008 decision, the D.C. Circuit found for the states, vacating CAMR and remanding it to the EPA for reconsideration.[162]

In February 2012, four decades after the first hints that mercury could be regulated as a hazardous air pollutant, and over ten years after the EPA first indicated its intention to regulate mercury from fossil fuel-fired power plants, the EPA released the first iteration of the final Utility MATS rule.[163] Although this long-delayed rule may suggest a strategy of waiting to install pollution control technologies until the regulatory requirements are known, as many utilities did, regulatory certainty emerged between 2000 and 2011. The study issued in 2000,[164] the D.C. Circuit's remand to the EPA to develop a new rule in 2005,[165] and the Obama Administration's announcement on March 16, 2009 that it would release a new rule restricting HAPs from power plants[166] all represented steps towards increased regulatory certainty. In such a context, for example, an informed regulator could have recognized this trend towards increased regulation of mercury emissions, as well as the CAA's statutory text that requires compliance within three years after the EPA finalizes a HAPs emission limit.[167] The regulator could have then called on power plant operators to develop cost-effective compliance options. With that information, state regulators at the PUC, environmental agency, and energy office could have worked together to assess the benefits of acting to reduce mercury emissions before the EPA finalized the Utility MATS rule, thereby helping utilities minimize their operating costs through long-term planning. In addition, the state regulators could have avoided concerns about grid reliability due to the number of retirements likely to occur during the three-year compliance window.[168]

161. New Jersey v. EPA, 517 F.3d 574, 581 (D.C. Cir. 2007).

162. *Id.* at 583–84.

163. National Emission Standards for Hazardous Air Pollutants From Coal- and Oil-Fired Electric Utility Steam Generating Units and Standards of Performance for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial-Institutional, and Small Industrial-Commercial-Institutional Steam Generating Units, 77 Fed. Reg. 9304, 9367 (Feb. 16, 2012) (to be codified at 40 C.F.R. pts. 60, 63).

164. Regulatory Finding on the Emissions of Hazardous Air Pollutants from Electric Utility Steam Generating Units, 65 Fed. Reg. 79,825, 79,830 (Dec. 20, 2000).

165. New Jersey, 517 F.3d at 583–84.

166. National Emission Standards for Hazardous Air Pollutants From Coal- and Oil-Fired Electric Utility Steam Generating Units and Standards of Performance for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial-Institutional, and Small Industrial-Commercial-Institutional Steam Generating Units, 76 Fed. Reg. at 24,976.

167. 42 U.S.C. § 7412(i)(3) (2006).

168. Recent studies by the Brattle Group and the North American Electric Reliability Corporation ("NERC") suggest that current and pending environmental regulations may account for capacity reductions of between thirty-six and sixty-five gigawatts ("GW") by 2020. Accounting for

3. Future Greenhouse Gas Emission Limits

The future cost of operating a coal-fired power plant will depend upon future policy to address climate change.[169] Electricity generation is the nation's single largest source of GHG emissions, and coal in particular has a higher carbon content than both petroleum and natural gas.[170] A requirement to capture carbon dioxide emissions during the typical forty- to sixty-year lifetime of a power plant would add significant costs that many utility regulators do not consider.[171] The cost-effectiveness of retrofitting an existing coal-fired unit to comply with new restrictions on conventional pollutants depends on the timing and stringency of future climate policy.[172]

After the U.S. Supreme Court's 2007 decision in *Massachusetts v. EPA*, finding that GHG emissions from mobile sources met the definition of a pollutant under the CAA,[173] the EPA has issued a number of rules that affect GHG emissions from fossil fuel-fired power plants. The two rules with the most significant potential impact on the sector include the "Tailoring Rule" for new, large sources of GHG emissions and major modifications that result in an increase of GHG emissions (including the vast majority of fossil fuel-fired power plants) and the proposed NSPS rule for new natural gas combined cycle turbines and coal-fired boilers. The Tailoring Rule requires Prevention of Significant Deterioration ("PSD") permits for new sources and major modifications that emit over 100,000 tons of carbon dioxide per year ("TPY") or increase GHG emissions by 75,000 TPY, respectively.[174] PSD permits contain a BACT requirement, granting regulators the authority to mandate technologies to

the effects of CSAPR and MATS, the Brattle Group found that a range of reductions between fifty to sixty-five GW were possible by 2020. BRATTLE GRP., *supra* note 148, at 11. Whereas, a 2011 study by NERC found that CSAPR and MATS would contribute reductions between thirty-six to fifty-nine GW by 2018. N. AM. ELEC. RELIABILITY CORP., *supra* note 107, at 117.

169. *See, e.g.*, Dalia Patino-Echeverri et al., *Economic and Environmental Costs of Regulatory Uncertainty for Coal-Fired Power Plants*, 43 ENVTL. SCI. & TECH. 578, 578 (2009).

170. EPA, 430-R-12-001, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990–2010, at 3–11 (2012), *available at* http://www.epa.gov/climatechange/Downloads/ghg emissions/US-GHG-Inventory-2012-Main-Text.pdf.

171. For example, the Minnesota PUC recently voted to allow utilities to omit carbon price projections in their long-term planning process for another five years. *See* Leslie Brooks Suzukamo, *Minnesota Allows Utilities More Time to Account for Carbon Emissions Costs,* PIONEER PRESS (Oct. 18, 2012, 12:01 AM), http://www.twincities.com/business/ci_21804033 /minnesota-allows-utilities-more-time-account-carbon-emission.

172. Patino-Echeverri et al., *supra* note 169, at 578.

173. Massachusetts v. EPA, 549 U.S. 497, 528 (2007).

174. Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 75 Fed. Reg. 31,514, 31,516 (June 3, 2010) (codified at 40 C.F.R. pts. 51, 52, 70, 71).

limit GHG emissions.[175] In March 2012, the EPA published a proposed NSPS rule limiting carbon dioxide emissions from new fossil fuel-fired power plants.[176] If finalized, it will require that all coal-fired boilers meet the GHG emission levels of a combined cycle natural gas turbine, essentially mandating that any new coal plant install carbon capture technologies.[177]

In the long term, potential climate policy adds significant risk to new investments.[178] A coal-fired power plant built today is expected to be operational for decades,[179] and a policy that regulates existing facilities and puts a price on carbon emissions during that timeframe might significantly increase its operating costs. Similar to the Utility MATS timeline described above, the stringency of future GHG emission limits is unknown. Therefore state regulators cannot predict what actions will be required of a utility or how the regulation will affect electricity prices. Yet, like the Utility MATS rule process, the level of certainty is increasing. The EPA is targeting GHG emissions, and will likely issue more rules for this purpose in the future unless Congress limits the EPA's authority to do so.[180]

Once the NSPS rule becomes final, the CAA will require states to implement, subject to the EPA's guidance and approval, new performance standards for GHG emissions from existing sources.[181] This requirement applies to existing sources when two criteria are met: (1) the existing facility would be subject to NSPS requirements if it were a new facility; and (2) the pollutant is not regulated as a criteria pollutant under the NAAQS program or as a HAP.[182] Despite this statutory requirement, EPA Administrator Lisa Jackson has indicated that the EPA

175. *Id.* at 31,520.

176. Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units, 77 Fed. Reg. 22,392 (proposed Apr. 13, 2012) (to be codified at 40 C.F.R. pt. 60).

177. *Id.* at 22,392.

178. *See* Patino-Echeverri et al., *supra* note 169, at 578.

179. It is common for coal-fired power plants to operate for forty or more years. Many power plants built during the 1970s are still operating today. *See EPA's IPM Base Case v.4.10*, EPA, http://www.epa.gov/airmarkt/progsregs/epa-ipm/docs/v410/NEEDSv410.zip (last updated Sept. 10, 2010) (data referenced appears in columns R and Q).

180. Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units, 77 Fed. Reg. at 22,392.

181. 42 U.S.C. § 7401 (2006); 42 U.S.C. § 7411 (2006); Monast et al., *supra* note 78, at 10,206.

182. The EPA must develop "standards of performance for any existing source for any air pollutant (i) for which air quality criteria have not been issued or which is not included on a list published under section 7408(a) of this title or emitted from a source category which is regulated under section 7412 of this title but (ii) to which a standard of performance would apply if such existing source were a new source." 42 U.S.C. § 7411(d).

has no current plans to issue performance standards for existing sources.[183] Nonetheless, assuming that the EPA finalizes the NSPS GHG rule, existing fossil fuel-fired units will very likely face limits on GHG emissions. While state regulators cannot predict with certainty the timing or stringency of the requirements, they can anticipate that new requirements will eventually apply and hedge the impact on their respective states by considering how GHG emission limits may affect the existing electricity infrastructure.

4. Implications of Regulatory Trends on Infrastructure Planning

Given the uncertainty under the NAAQS process and the EPA's evolving approach to GHG regulation under the CAA, ratepayers and utility shareholders could benefit if state regulators evaluate the potential long-term cost impacts of utility investment proposals under multiple regulatory scenarios. Ignoring those potential impacts, on the other hand, may lead to higher prices and concerns about reliability if a rule induces a large number of plant retirements in a short period of time.

Evaluating potential long-term operating costs under multiple regulatory scenarios does not necessarily result in accurate predictions of costs or compliance obligations. Politics, court cases, technological advances, and scientific knowledge may affect the regulatory pathways.[184] The scenario analysis does, however, allow regulators and facility operators to consider the relative costs of taking action in the near term to hedge against the risk of more stringent future regulations versus the cost of waiting until there is regulatory certainty before acting.[185] Assessing the trends and the likelihood of future regulations may also provide regulators with some certainty regarding future requirements.

CSAPR provides a useful example. Although the D.C. Circuit overturned CSAPR, the EPA still has a legal obligation to enforce the good neighbor requirements in Section 110 of the CAA.[186] Because the good neighbor requirements turn on a *state's* contribution to downwind pollution (as opposed to an individual facility's contribution), there is a direct correlation between the amount of nitrogen oxide and sulfur dioxide pollution coming from an upwind state and the impact of the regulation on the state's electricity sector.[187] By relying on the EPA's

183. Timothy Gardner, *Government Proposes First Carbon Limits on Power Plants*, REUTERS, Mar. 27, 2010, *available at* http://www.reuters.com/article/2012/03/27/us-usa-carbon-idUSBRE82Q0W120120327.

184. *See, e.g.*, EME Homer City Generation, L.P. v. EPA, 696 F.3d 7, 12 (D.C. Cir. 2012).

185. *See* DAVID HOPPOCK ET AL., *supra* note 24, at 31.

186. 42 U.S.C. § 110(a)(2)(D)(i)(I).

187. *Id.*

analysis of which states' nitrogen oxide and sulfur dioxide emissions affect the air quality in downwind states, regulators in upwind states can anticipate the degree to which a new good neighbor rule will affect its electricity sector. Early efforts to reduce nitrogen oxides and sulfur dioxide through pollution controls or investment in generation options that pollute less could, therefore, reduce impacts,[188] even if the exact requirements are not known.

More generally, the regulatory trends described above, as well as the remaining uncertainty, demonstrate the value of investments in electric power generation options that produce less, or no, air emissions. For example, solar, wind, and nuclear facilities do not emit GHGs or pollutants subject to NAAQS, and therefore are reliable hedges against future regulations in these areas.[189] Advanced coal-fired power plants that capture carbon emissions would likely meet any new GHG emission limits.[190] Even conventional natural gas combined cycle turbines can hedge against future regulations, because these facilities do not emit sulfur dioxide and emit fifty percent of the GHGs per kilowatt-hour of electricity originating from a conventional coal-fired plant.[191] There may be very legitimate reasons not to pursue one or more of the options listed above, including construction costs,[192] concerns about waste disposal,[193] land use concerns,[194] or concerns about fuel price volatility (especially

188. For example, avoiding rate impacts of multiple retrofits within a short compliance period and retrofits to recently constructed or modified plants.

189. Because the output of wind and solar power vary throughout the day with changes in wind speed and insolation, other generators (typically natural gas) must ramp up and down quickly to continuously balance the grid, affecting their emissions of nitrogen oxide and carbon dioxide. *See, e.g.*, Warren Katzenstein & Jay Apt, *Air Emissions Due to Wind and Solar Power,* 43 ENVTL. SCI. & TECH. 253, 253–58 (2009). These additional emissions from backup generators offset a portion of the emissions reductions from increased use of non-emitting generation. *Id.* (finding that over a wide range of renewable energy penetration, approximately eighty percent of expected emissions reductions are realized due to additional emissions from ramping up and down natural gas generators).

190. *See* Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units, 77 Fed. Reg. 22,392 (proposed Apr. 13, 2012) (to be codified at 40 C.F.R. pt. 60).

191. *See Clean Energy,* EPA, http://www.epa.gov/cleanenergy/energy-and-you/affect/natural-gas.html (last updated Oct. 17, 2012).

192. Patino-Echeverri et al., *supra* note 169, at 584 ("[I]t seems sensitive to delay [greenhouse gas] regulation until more about feasibility, performance, and costs of control technologies . . . .").

193. Hank C. Jenkins-Smith et al., *New Perspectives on Nuclear Waste Management,* 1 RISKS, HAZARDS & CRISIS PUB. POL'Y 1, 3 (2010).

194. Vasilis Fthenakis & Hyung Chul Kim, *Land Use and Electricity Generation: A Life-cycle Analysis*, 13 RENEWABLE & SUSTAINABLE ENERGY REVS. 1151, 1465 (2009) (stating that critics of renewable energy often cite land-use concerns).

for natural gas).[195] It is prudent, however, to consider the range of options against the likelihood of costly environmental regulations in the future, and the public health benefits of near-term reductions in air and water pollution.

IV. UTILITY REGULATION THAT CONSIDERS ENVIRONMENTAL IMPACTS AND LONG-TERM CONSUMER PRICES

Some states are already taking steps to consider longer-term impacts of electric utility investments, both through PUC decisions and through legislation. This section describes recent examples of PUC decisions that address environmental risk by allowing utilities to consider future compliance costs when making specific investments, then summarizes legislative actions in Minnesota, North Carolina, and Colorado that allow utilities to prepare for future federal requirements. While not a comprehensive list, these examples demonstrate the opportunities for states to allow electric utilities to hedge against regulatory uncertainty and pursue infrastructure investments that are more environmentally sound, even if the investments may not have the lowest cost in the near term. The TBL approach proposed in Part VI builds upon these approaches, providing a broad and actionable framework for states to integrate their energy, environmental, and consumer protection goals. The examples also demonstrate that the value of the TBL for electric utility regulation is not limited to a particular region of the country, energy portfolio, or political ideology.

A. Examples at the Public Utility Commission Level

In most traditionally regulated states, PUCs must determine that a proposed investment in a new electric generating facility serves the public convenience and necessity before the utility can begin construction.[196] Utilities often apply for a similar determination before commencing environmental retrofits of existing facilities to help ensure

195. KEN COSTELLO, NAT'L REGULATORY RESEARCH INST., HYDRAULIC FRACTURING: PLACING WHAT WE KNOW TODAY IN PERSPECTIVE 2–3 (2011), *available at* http://www.nrri.org/pubs/gas/NRRI_Hydraulic_Fracturing_Oct11-16.pdf (describing the importance of natural gas prices in PUC and utility decisions and uncertainty surrounding current prices).

196. *See generally* EDISON ELEC. INST., STATE GENERATION AND TRANSMISSION SITING DIRECTORY (2012), *available at* http://www.eei.org/ourissues/ElectricityTransmission/Documents/State_Generation_Transmission_Siting_Directory.pdf; Hausman & Neufeld, *supra* note 39*,* at 1050.

that the PUC will allow the utility to recover its costs.[197] In the past, PUCs have found that risky expenditures on cancelled plants, construction overruns, and long-term fuel contracts that have exceeded market rates were imprudent and unrecoverable.[198] PUCs have also found utility investments in new technologies or expensive environmental control equipment to be risky expenditures, given the potential for construction costs to exceed expectations or for anticipated environmental requirements to not materialize.[199]

Despite the risk of high construction costs or absence of expected requirements, some PUCs recognize that there are benefits to considering future environmental regulations with regards to specific investment decisions. For example, a particular investment might not be least-cost in the short term, but might hedge against potentially higher future costs to comply with future environmental requirements. Those PUCs have primarily relied on a broader interpretation of public convenience and necessity to justify these types of hedging investments.

The PUCs in Indiana, West Virginia, and Mississippi have allowed utilities to take likely future environmental regulations into account when making specific investment decisions, allowing utilities to invest in unconventional technology that may help meet GHG standards, and technologies that are more effective at controlling conventional pollutants. The state regulatory commission in each state approved utility plans to build Integrated Gasification Combined Cycle ("IGCC")

197. M.J. BRADLEY & ASSOCS. LLC, EP-W-07-064, PUBLIC UTILITY COMMISSION STUDY 20-21 (2011), *available at* http://www.epa.gov/airtoxics/utility/puc_study_march2011.pdf.

198. *See, e.g.*, BURNS ET AL., *supra* note 52, at 79; Amy R. Templeton, *Prudence of Electric Utilities' Coal Contracts and Fuel Procurement Practices: The Impact on Coal Contract Negotiations*, 89 W. VA. L. REV. 715, 715 (1987). The 1970s ushered in a new era of risk in the power sector due to the oil embargoes, load growth uncertainties, a suite of new federal environmental laws, rapidly changing nuclear safety regulations, construction cost overruns, and cancelled power plants. BURNS ET AL., *supra* note 52, at 79. With the new risk and uncertainty, state commissions became more active in reviewing utility planning processes and investment decisions as well as challenging costs that utilities seek to pass on to consumers. *Id.* Many state commissions turned to the prudent investment test as they responded to the riskier utility environment by seeking the proper allocation of risk between ratepayers and utility company when calculating rates. Templeton, *supra* note 198, at 715 n.2. To apply the test, commissions ask whether a utility's decision was "reasonable under the circumstances" and only allow recovery of prudently incurred costs. BURNS ET AL., *supra* note 52, at iv. Commissions use this test to allow and disallow costs associated with cancelled power plants, construction cost overruns, and long-term contracts for fuel that exceed market rates. *Id.*

199. Reinelt & Keith, *supra* note 113, at 101–03 (describing the risk for utilities and regulators of investing in low carbon technologies given uncertainty surrounding future carbon regulation).

coal facilities that use coal to produce a synthesis gas or "syngas" rather than burning the coal directly.[200]

In their respective decisions to approve an investment in IGCC technology, the PUCs in Indiana[201] and West Virginia[202] emphasized the environmental benefits of IGCC technology relative to conventional coal-fired power plants. In particular, the Decisions point to lower emissions of regulated pollutants, including nitrogen oxides and sulfur dioxide, and pollutants that the EPA is working toward regulating such as mercury, coal ash, and greenhouse gases.[203] In addition, both states have enacted legislation to encourage the continued use of in-state coal and the development of clean coal technology.[204]

Duke Energy expects the IGCC plant in Edwardsport, Indiana to begin commercial operation by early 2013.[205] Appalachian Power Company, however, did not move forward with the West Virginia facility because the plant would have also served customers in Virginia where regulators did not approve cost recovery for the investment.[206] Virginia regulators determined that the technology is not yet commercially proven.[207] They also concluded that the utility's cost estimate was not credible[208] and that they do not have enough information to determine whether IGCC with carbon capture and sequestration would be a cost-effective way to comply with future carbon regulations.[209] While Virginia regulators

200. *See* Petition of Miss. Power Co., No. 2009-UA-014 (Miss. Pub. Serv. Comm'n May 26, 2010) (final order on remand granting a certificate of public convenience and necessity); Petition of Appalachian Power Co. & Wheeling Power Co., No. 06-0033-E-CN (Pub. Serv. Comm'n of W. Va. Mar. 6, 2008); Joint Petition & Application of Duke Energy Indiana Energy, Inc., No. 43114 (Ind. Util. Reg. Comm'n Nov. 20, 2007), *available at* https://myweb.in.gov/IURC/eds/Modules/Ecms/Cases/Docketed_Cases/ViewDocument.aspx?DocID=0900b631800e36d1 (approving Duke Energy's proposed IGCC plant located in Edwardsport, Indiana in 2007, which began operation in 2012).

201. Joint Petition & Application of Duke Energy Indiana Energy, Inc., No. 43114, slip op. at 42 (Ind. Util. Reg. Comm'n Nov. 20, 2007).

202. Petition of Appalachian Power Co. & Wheeling Power Co., Case No. 06-0033-E-CN, slip op. at 70 (Pub. Serv. Comm'n of W. Va. Mar. 6, 2008).

203. *Id.* at 72.

204. Environmental compliance plans; required information, IND. CODE ANN. § 8-1-27-6 (LexisNexis 2012). Legislative findings; purpose of chapter, IND. CODE ANN. § 8-1-8.8-1 (LexisNexis 2012). Rate incentives for utility investment in qualified clean coal and clean air control technology facilities, W. VA. CODE ANN. § 24-2-1g (LexisNexis 2008).

205. *Edwardsport Integrated Gasification Combined Cycle (IGCC) Station: Project Overview*, DUKE ENERGY, http://www.duke-energy.com/about-us/edwardsport-overview.asp (last visited Jan. 5, 2013).

206. Application of Appalachian Power Co., No. PUE-2007-00068, slip op. at 2 (Va. State Corp. Comm'n Apr. 14, 2008), 2008 WL 1778119, at *1–3.

207. *Id.* at 12.

208. *Id.* at 3.

209. *Id.* at 7.

differed in their opinion of the technology's maturity, expected cost, and likely cost-effectiveness to address GHGs, the Virginia PUC endorsed the utility's effort to account for future environmental requirements.[210] This example demonstrates the challenges of state-level regulation of regional electricity markets that would remain even if individual states take steps towards their energy, environmental, and consumer protection goals.

By comparison, the Mississippi Public Service Commission ("MPSC") based its approval of an IGCC plant on the plain language of the public convenience and necessity in its enacting legislation.[211] Approving the $2.4 billion plant, the MPSC concluded that the high price tag was justified as a means "to promote adequate, reliable and economical [electric] service to all citizens of the state"[212] because of the price risks associated with natural gas volatility and prospective climate change legislation. Demonstrating how long-term planning can incorporate future environmental requirements, the MPSC found that IGCC serves to mitigate a number of risks associated with increasingly stringent environmental standards. Specifically, the MPSC found climate change legislation was likely and that such legislation would undoubtedly make carbon dioxide emissions more costly as utilities became subject to emissions caps or new technology requirements.[213] With technology capable of capturing sixty-five percent of carbon dioxide, IGCC facilities would avoid the costs of installing environmental retrofits.[214] Furthermore, federal and state support for clean coal technology like IGCC could help offset the costs of development.[215] Although current natural gas prices are low[216] over fifty percent of electrical generation in Mississippi is natural gas-fired,[217] and the MPSC found that increased reliance on natural gas could leave Mississippi consumers footing substantially larger bills in the event of future price increases.[218] In

210. *Id.* at 16.

211. Petition of Miss. Power Co., No. 2009-UA-014, ¶ 108 (Miss. Pub. Serv. Comm'n, Apr. 24, 2012) (on file with author) (granting a certificate of public convenience and necessity).

212. MISS. CODE ANN. § 77-3-2(c) (2010).

213. Petition of Miss. Power Co., No. 2009-UA-014, ¶ 108 (describing the likelihood of regulations that would result in "explicit or implicit requirements to capture and sequester [carbon dioxide] from stationary sources").

214. *Id.*

215. *Id.* ¶ 114.

216. *See id.* ¶ 123.

217. *Id.* ¶ 139.

218. *See id.* ¶ 160.

contrast, the Kemper County, Mississippi project would use lignite coal mined on site at a relatively consistent price.[219]

With these risks and benefits in mind, Mississippi Power and the MPSC evaluated a number of alternative generation methods across more than twenty gas price and carbon compliance forecasts.[220] While initially more expensive than natural gas or other fuels, IGCC facilities proved a better long-term economic choice across the majority of scenarios.[221] Faced with a decision between strategic time preferences,[222] the MPSC expressed a preference for long-term planning.[223] Recognizing that technological advances may eventually limit such tradeoffs, the MPSC saw little benefit in waiting for uncertain advantages:

> Whether it's oil embargos, nuclear catastrophes, environmental regulations, climate change, renewables or shale gas, the one certainty is that change, ingenuity, innovation and hope for a better future will always exist. Nevertheless, a public utility must prudently plan for its future, in part, to guard against uncertainty. The Kemper Project provides a long-term baseload generation solution that exists today and will provide a diversified and stable fuel source for the future, avoiding an overreliance on natural gas and its corresponding price volatility. The Commission finds that there is no benefit to waiting for ten more years to find a forty year solution that exists today.[224]

In these instances, the PUCs in Indiana, West Virginia, and Mississippi acted independently, without a specific mandate to consider potential regulations or other future price vulnerabilities.[225] Statutory rules in Mississippi require that the MPSC grant a certificate to construct a new generation facility only where "convenience and necessity requires, or will require, such construction."[226] Although the clause "will require" suggests a broader temporal dimension to MPSC decisions, the MPSC must still make a slight logical leap in order to consider the effect of prospective regulations on future generation facilities.[227] While the

219. *Id.*
220. *Id.* ¶¶ 118–21.
221. *Id.* ¶ 130.
222. *Id.* ¶ 135.
223. *Id.* ¶ 141.
224. *Id.*
225. *Compare* COLO. REV. STAT. § 40-3.2-206(3)(c) (West 2004 & Supp. 2012) (requiring the PUC to "incorporate a reasonable estimate for the cost of reasonably foreseeable emission regulation consistent with the commission's existing practice"), *with* MISS. CODE ANN. § 77-3-14(1) (2010).
226. MISS. CODE ANN. § 77-3-14(1).
227. *Compare id.*, *with* KY. REV. STAT. ANN. § 278.020(1) (LexisNexis 2009).

decision to approve the Kemper County project has subsequently come under fire from environmental advocacy groups critical of coal,[228] the MPSC's innovative interpretation of its statutory authority demonstrates the possibility for similar interpretive moves in other states.

A recent decision by the Kentucky Public Service Commission ("KPSC"), however, illustrates the limits of a solely PUC-based approach to integrating environmental considerations into energy infrastructure decisions.[229] In 2009, Kentucky Power filed an application with the KPSC seeking approval to enter into an agreement to purchase 100 megawatts of electrical output from FPL Energy Illinois Wind, LLC over a twenty-year period.[230] In this instance, the KPSC declined to consider prospective environmental regulations. In its application, Kentucky Power asserted that the Power Purchase Agreement would allow it to meet likely renewable portfolio mandates at both the state and federal level.[231] If renewable portfolio requirements were enacted, Kentucky Power argued, increased demand for qualifying renewable energy would allow renewable facility operators to charge higher prices, causing increased rates.[232] The KPSC, however, denied the application, finding that it lacked statutory authority to consider the effect of such prospective regulations.[233]

Citing support from both statutory text and court decisions, the KPSC found it was constrained to consider only requirements "known and measurable."[234] Furthermore, the KPSC prioritized the option with the lower current costs: "'least cost is one of the fundamental principles utilized when setting rates that are fair, just, and reasonable."[235] Kentucky Revised Statutes Chapter 278, relied upon by the KPSC,

228. Christa Marshall, *Carbon Capture: Southern Co.'s Kemper Project Running $366M Over Budget*, CLIMATEWIRE (June 14, 2012), http://www.eenews.net/climatewire/rss/2012/06/14/3.

229. Application of Ky. Power Co., No. 2009-00545, slip op. at 1 (Ky. Pub. Serv. Comm'n June 28, 2010) *available at* http://psc.ky.gov/order_vault/orders_2010/200900545_06282010.pdf (order denying request for wind contract).

230. *Id.*

231. *Id.* at 2 ("Kentucky Power states that, although no national renewable portfolio standard ("RPS") currently exists, there have been efforts by the federal government to reduce the emission of carbon dioxide and require increasing amounts of energy to be generated by renewable resources. At the state level, Kentucky Power cites a 2008 report issued by Kentucky Governor Steven L. Beshear entitled 'Intelligent Energy Choices for Kentucky's Future: Kentucky's 7-Point Strategy for Energy Independence.' That report also proposed a renewable energy standard which would require utilities over time to increase their use of renewable sources of generation.").

232. *Id.* at 2–3.

233. *Id.* at 7.

234. *Id.*

235. *Id.* at 5.

provides that new generating capacity may be bought, or built, only where "public convenience and necessity require the service or construction."[236] Importantly, the Statute does not require that such decisions be made according to immediate least-cost, rather, the statute seems to grant the KPSC substantial discretion to interpret "public convenience and necessity."[237]

It is unclear from the statutory authority cited by the KPSC that the Kentucky legislature intended to hamstring the KPSC from considering prospective environmental regulations.[238] The enabling legislation provides little in the way of constraints or direction, but grants the KPSC broad deference.[239] Moreover, the long planning, permitting, and construction horizons involved in electrical generation would seem to require anticipating prospective regulations. Were least-cost considered over the full twenty-year period of the contract, wind generation would very likely satisfy the requirement.[240] The dissenting commissioner provided a similar analysis to that argued by this Article:

> As a Commissioner, I am concerned that ratepayers in a state like Kentucky with no nuclear power, and little potential for in-state renewables . . . will be facing large rate increases. This modest proposal would have guaranteed a price for 20 years for at least a small portion of Kentucky Power's generation mix and thus I believe it is in fact needed.[241]

Relying on PUCs to adequately respond to environmental risks may have limitations. Absent specific legislative requirements to consider these risks, commissioners may exercise their wide-ranging discretion to deny utility attempts to "get ahead" of environmental regulations by implementing innovative technologies and renewable portfolios. Unfortunately, focusing primarily or exclusively on near-term costs may result in both poor environmental outcomes and higher costs for ratepayers.

B. Examples at the Legislative Level

As the examples above demonstrate, while some PUCs may interpret their role in assessing whether an investment serves public convenience

236. KY. REV. STAT. ANN. § 278.020(1) (LexisNexis 2009).
237. *See id.*
238. *See id.*
239. *See id.*
240. Application of Ky. Power Co., No. 2009-00545, slip op. at 9–10 (Gardner, V. Chairman, dissenting).
241. *Id.* at 9.

and necessity to include considerations of environmental risk, others may not. However, states can influence PUC priorities through legislation that explicitly allows or requires utilities to take future environmental requirements into account when making investment decisions. State legislatures have the opportunity to clarify what costs and risks PUCs should prioritize, consistent with other state priorities such as avoiding overreliance on a single fuel source or risk exposure to future climate change legislation. Minnesota and Colorado recently passed laws establishing such requirements. States can also adopt legislation that provides regulatory certainty, requiring utilities to make investments well in advance of new regulations when doing so promotes state environmental goals. Examples from North Carolina and Colorado demonstrate how well-designed legislation can reduce risk in the electricity sector while promoting state environmental goals.

1. Minnesota: Advance Determination of Prudence

Minnesota recently passed legislation that allows utilities to apply for an Advance Determination of Prudence ("ADP") for environmental projects.[242] In contrast to a Certificate of Public Convenience and Necessity ("CPCN"),[243] which does not guarantee recovery in most states, an ADP provides greater assurance of cost recovery and can allow utilities to begin recouping costs before the equipment is operational.[244] By assuring the utility that it will recover costs, ADP can remove the utility's incentive to wait until rules are final to make investments during short compliance periods. It also reduces the risk for the investor, which can lower the utility's cost of capital (and total project cost for ratepayers).[245] The Minnesota law requires that a utility's application

242. MINN. STAT. ANN. § 216B.1695 (West 2010).

243. In the 1970s and 80s, many commissions did not allow recovery of costs associated with cancelled plants (and coal contracts above-market price) even though commissions granted CPCNs for construction based on high projected demand that never came to be. *See* BURNS ET AL., *supra* note 52, at 83; Templeton, *supra* note 198, at 715. During this period commissions began to rely heavily on "prudence reviews" to determine which costs were allowable in rates. Templeton, *supra* note 198, at 715. In many cases commissions allowed recovery of construction costs for cancelled plants on the basis that they were prudently incurred at the time, but in some cases commissions disallowed costs on the basis that they were imprudent or imprudent after a point in time, therefore costs incurred after a certain date are not allowed in rate base. *Id.*

244. N.D. CENT. CODE § 49-05-16 (1999) ("In this section . . . resource addition means construction, modification, purchase, or lease of an energy conversion facility, renewable energy facility, demand response system, transmission facility, or a contract to acquire energy, capacity, or demand response for the purpose of providing electric service . . . . (7) There is a rebuttable presumption that a resource addition located in the state is prudent."); M.J. BRADLEY & ASSOCS., *supra* note 197, at 20–21.

245. M.J. BRADLEY & ASSOCS., *supra* note 197, at 21.

include an assessment of "all anticipated state and federal regulations related to the production of electricity from the . . . facility."[246] It also allows the utility to begin recovering costs for an approved project in the next rate case.[247]

Otter Tail Power Company applied for an ADP under the new law in early 2011 for pollution controls on a coal-fired power plant located in South Dakota, which Otter Tail Corporation ("Otter Tail") owns jointly with Montana-Dakota Utilities Co. and NorthWestern Energy. The utilities proposed to install new controls for nitrogen oxides and sulfur dioxide that comply with South Dakota's updated SIP under EPA's Regional Haze Program.[248] In addition, they submitted plans to install mercury controls at the same time in "anticipation that such controls w[ould] be required by the EPA within the . . . project construction timeframe."[249]

Though the rule was not yet final, Otter Tail anticipated that the proposed mercury control equipment would allow the facility to comply with the Utility MATS rule, including control of metals, acid gases, and organic hazardous air pollutants.[250] By installing the mercury controls at the same time as the equipment to meet the Regional Haze requirements, the utilities planned to tie in both the Regional Haze control equipment and mercury control equipment during the plant's scheduled outage in 2015, in order to reduce overall costs.[251]

In its application, Otter Tail Power Company explained that planned outages for routine maintenance occur once every three to five years at the facility,[252] and scheduling additional outages for baseload facilities tends to increase costs because it requires the utility to dispatch plants with higher costs to meet base demand during that period.[253] Otter Tail also explained that it expects materials and labor costs to escalate as the federal compliance deadline for the Utility MATS rule approaches and

246. MINN. STAT. ANN. § 216B.1695 (West 2010).

247. *See id.*

248. Otter Tail Power Co.'s Petition for an Advance Determination of Prudence for its Big Stone Air Quality Control System Project, No. E-017/M-10-1082, slip op. at 7 (Minn. Pub. Utils. Comm'n Nov. 9, 2011), *available at* https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={ED337DA8-E0E2-40EE-A647-361BF4A13FF1}&documentTitle=201111-68265-01 (stating findings of fact and conclusions of law).

249. *Id.*

250. *See id.* at 21.

251. *See id.* at 17.

252. *See id.*

253. METIN CELEBI ET AL., BRATTLE GRP., SUPPLY CHAIN AND OUTAGE ANALYSIS OF MISO COAL RETROFITS FOR MATS 42 (2012), *available at* http://www.brattle.com/_documents/UploadLibrary/Upload1039.pdf.

many companies retrofit plants to meet the new requirement.[254] It concluded that ratepayers would benefit from early action to comply with the impending rule.[255]

The Minnesota PUC waited until the EPA finalized the Utility MATS rule to issue its order granting Otter Tail the ADP for the Big Stone air quality project.[256] However, because utilities must consider future environmental regulations in their ADP application,[257] it seems to grant the Minnesota PUC latitude to preapprove projects that will help utilities comply with future environmental regulations.

2. North Carolina: The Clean Smokestacks Act[258]

North Carolina adopted the Clean Smokestacks Act ("Session Law 2002-4" or "Clean Smokestacks Act") in 2002, which requires the state's major investor-owned utilities, Duke and Progress Energy,[259] to reduce nitrogen oxide emissions from their in-state coal plants seventy-seven percent by 2009 and sulfur dioxide emissions seventy-three percent by 2013.[260] To achieve these goals, the law allows utilities to choose between retrofitting existing plants with environmental control technology and retiring uncontrolled plants.[261] The law also includes a five-year cap on base rates and allows accelerated recovery of retrofit capital costs to balance the utilities' need to recoup investments with price protection for consumers.[262]

Over a nine-year period Duke installed controls or other measures to reduce nitrogen oxide emissions from all of its coal plants in North Carolina and Progress installed nitrogen oxide controls on all coal plants it will not retire.[263] By the end of 2011, Duke and Progress will have

254. *See* Otter Tail Power Co.'s Petition for an Advance Determination of Prudence for its Big Stone Air Quality Control System Project, No. E-017/M-10-1082, slip op. at 43.

255. *See id.*

256. Big Stone Plant Air Quality Control System Project Quarterly Report § 3 (2012), *available at* http://www.psc.nd.gov/database/documents/11-0165/105-010.pdf.

257. MINN. STAT. ANN. § 216B.1695 (West 2010).

258. *See generally* HOPPOCK ET AL., *supra* note 27 (analyzing the effects of North Carolina's Clean Smokestacks Act on ratepayers and air quality).

259. Duke Energy and Progress Energy merged on July 2, 2012, and now operate as Duke Energy. *See Duke Energy and Progress Energy Have Merged*, DUKE ENERGY, https://www.duke-energy.com/corporate-merger/ (last visited Jan. 5, 2013).

260. *See* Clean Smokestacks Act, 2002 N.C. Sess. Laws 4 (codified as amended at N.C. GEN. STAT. § 62-143 (2011) and N.C. GEN. STAT. §§ 143-215.105–.114C (2011)).

261. *Id.*

262. *See* N.C. GEN. STAT. § 62-133.6 (2011).

263. *See* N.C. DEP'T OF ENV. & NATURAL RES. & N.C. UTILS. COMM'N, IMPLEMENTATION OF THE "CLEAN SMOKESTACKS ACT" 21 (2010), *available at* http://daq.state.nc.us/news/leg/2010_Clean_Smokestacks_Act_Report_Final.pdf.

retired or installed sulfur dioxide scrubbers on all in-state coal plants.[264] The Clean Smokestacks Act has thus facilitated the retirement of 2.8 gigawatts of uncontrolled coal plants.[265]

The Clean Smokestacks Act helped North Carolina meet the then-current NAAQS, and facilitated compliance with additional federal standards put in place after the Clean Smokestacks Act became law. By 2008, the EPA redesignated six out of the seven ozone nonattainment areas of North Carolina as attainment or maintenance areas.[266] Today, North Carolina utilities are in a good position to comply with the acid gas requirements of the Utility MATS rule and with future EPA regulation of air pollution that crosses state boundaries as a result of the emissions abatement requirements in the Clean Smokestacks Act.[267]

The Clean Smokestacks Act also facilitated utility long term planning by providing regulatory certainty. This certainty helped Duke and Progress avoid potential reserve margin impacts of environmental standards that could create cost and reliability risks for customers.[268] By giving Duke and Progress a head start compared to other utilities, the Clean Smokestacks Act also mitigated the risk of cost escalation for sulfur dioxide scrubbers and nitrogen oxide controls leading up to federal compliance deadlines.[269] Without the mandate to reduce emissions, it may have been difficult for the utilities to convince the North Carolina Utilities Commission to take early action. Intervenors who are opposed to any short-term increases in cost would have likely opposed any plans to reduce emissions at existing plants prior to the release of finalized regulations from the EPA.[270]

The flexibility and extended compliance timeframe of the Clean Smokestacks Act allowed Duke Energy and Progress Energy to adjust their compliance plans as market conditions changed. The utilities have elected to retire some coal plants they had originally slated to retrofit

264. *See id.*

265. *See* HOPPOCK ET AL., *supra* note 29, at 11 tbl.3, 22.

266. *See Detailed Raw Ozone Data*, N.C. DEP'T OF ENV'T. & NATURAL RES., http://www.ncair.org/monitor/data/o3design/ (last visited Jan. 5, 2013) (providing one- and eight-hour ozone averages from 1997 to 2011); *see also* HOPPOCK ET AL., *supra* note 29, at 22.

267. *See* N. AM. ELEC. RELIABILITY CORP., *supra* note 107, at 73–78 (describing the impacts of four probable EPA regulations currently in the process of being proposed on existing power suppliers); N.C. DEP'T OF ENV'T & NATURAL RES. & N.C. UTILS. COMM., *supra* note 263, at 15–16.

268. N. AM. ELEC. RELIABILITY CORP., *supra* note 107, at 174–79.

269. *See* HOPPOCK ET AL., *supra* note 29, at 8 (discussing environmental compliance cost escalation during short compliance timelines).

270. Claude M. Vaughan, Jr. & James K. Sharpe, *The Public Utility Regulatory Policies Act: Implications for Regulatory Commission Reform*, 41 PUB. ADMIN. REV. 387, 389–90 (1981) (describing the roles and interests of intervenors).

with pollution controls due to decreases in natural gas prices and increases in coal plant construction costs.[271] Given shorter federal compliance timelines, utilities in other states that must now make similar investments to comply with EPA rules may not have the same ability to adjust plans as conditions change.

3. Colorado: The Clean Air-Clean Jobs Act

Colorado adopted the Clean Air-Clean Jobs Act ("CACJA") in May of 2010.[272] The CACJA requires Colorado's two investor-owned utilities, Black Hills Energy and Xcel Energy, to reduce nitrogen oxide emissions from roughly half of their coal-fired generating capacity to at least seventy percent below 2008 levels by 2017.[273] To that end, the CACJA requires that each utility submit an emissions reduction plan to the utilities commission for approval by August 2010.[274] The CACJA suggests that utilities replace coal with natural gas, but allows multiple means of emission reduction.[275] Emission reduction plans must be "consistent with the current and *reasonably foreseeable* requirements of the [CAA]"[276] and utilities must "[i]ncorporate a reasonable estimate for the cost of reasonably foreseeable emission regulation."[277] To ensure the plans appropriately account for future environmental regulation, the Department of Public Health and Environment provides guidance to the PUC in evaluating the plans.[278] Under the CACJA, utilities may also recover costs prudently incurred in implementing their approved reduction plans,[279] and enter into long-term contracts to purchase natural gas to hedge against future price volatility.[280]

Managing the cost of EPA regulations—such as the Utility MATS rule and forthcoming rules governing greenhouse gases—through advanced

271. *See* N.C. DEP'T OF ENV'T. & NATURAL RES. & N.C. UTILS. COMM'N, *supra* note 263, at 2, 5, 21.

272. 2010 Colo. Legis. Serv. Ch. 140 (West) ("An Act concerning incentives for electric utilities to reduce air emissions, and, in connection therewith, requiring plans to achieve such reductions that give primary consideration to replacing or repowering coal generation with natural gas and also considering other low-emitting resources, and making an appropriation.").

273. The seventy to eighty percent reduction is measured against the 2008 emissions of plants covered under the utility's plan (those plants that constitute 900MW or half of the generating capacity). COLO. REV. STAT. ANN. §§ 40-3.2-204(2)(a), -205(1)(a) (West 2004 & Supp. 2012).

274. *Id.* § 40-3.2-204(1).

275. *Id.* § 40-3.2-202.

276. *Id.* § 40-3.2-204(2)(b)(IV) (emphasis added).

277. *Id.* § 40-3.2-206(3)(c).

278. *Id.* §§ 40-3.2-203(2), -204(2)(b).

279. *Id.* § 40-3.2-207.

280. *Id.* § 40-3.2-202(2).

planning and a coordinated effort is one explicit goal of the CACJA.[281] Although the CACJA requires that utility plans meet reasonably foreseeable new requirements, the legislation will also be instrumental in meeting existing requirements for regional haze and ozone.[282]

Like North Carolina's Clean Smokestacks Act, the CACJA directly addresses the uncertainty utilities face with regard to future environmental requirements. For Colorado's investor-owned electric utilities, the CACJA negotiated a future in which coal retirements and retrofits are already planned, making it easier to meet forthcoming EPA rules while maintaining reliability. Because Colorado utilities are now planning ahead, they have a longer time horizon for compliance, mitigating the risk of construction and equipment price escalation during shorter federal compliance periods. The comprehensive planning approach allows utilities and regulators to take a broad, long-term view and tackle multiple problems at once—among them, ground-level ozone, regional haze, air toxics, and greenhouse gases. Such a comprehensive approach to environmental compliance is difficult for utilities to execute if they take on federal standards as they come because compliance timelines and techniques are often determined by statute.[283] Though the CACJA requires utilities to make investments that will raise rates in the near term, it protects ratepayers in the long term by reducing the price risk associated with future environmental compliance and allowing utilities to hedge against natural gas price volatility.

V. CHALLENGES TO ALIGNING ENVIRONMENTAL AND CONSUMER PROTECTION GOALS

While the above examples demonstrate the potential for states to successfully integrate energy, environmental, and consumer protection goals, states must overcome key challenges within the existing regulatory system. This Part briefly describes three key challenges aligning state energy, environmental, and consumer protection goals—the adjudicatory

281. *See id.* § 40-3.2-202(1) ("The General Assembly hereby finds . . . that the federal 'Clean Air Act' . . . will likely require reductions in emissions from coal-fired power plants operated by rate-regulated utilities in Colorado. A coordinated plan of emission reductions . . . will enable Colorado rate-regulated utilities to meet the requirements . . . at a lower cost . . . ."); *see also* Ronald J. Binz, *Colorado's Clean Air-Clean Jobs Act Remakes State's Electric Fleet*, NAT. GAS & ELECTRICITY, Feb. 2011, at 8, 8–9 (citing the Colorado legislature's declaration that a coordinated approach will cost less than a piecemeal approach).

282. *See* Binz, *supra* note 282, at 8.

283. *See, e.g.*, *supra* note 166 and accompanying text (describing the statutory requirement for existing sources to comply with regulations governing hazardous air pollutants within three years of promulgation).

role of the PUC, lack of policy coordination, and regulatory uncertainty. The following Parts introduce the TBL approach and describe strategies that states can adopt to overcome these challenges.

A. Traditional Adjudicatory Role of Public Utility Commissions

PUCs often function as quasi-judicial bodies, adjudicating matters such as rate determinations, certificates of public convenience and necessity, and handling complaints from individuals about the quality of utility service.[284] During these proceedings, utility commissioners act like judges, applying "general rules to a specific interest."[285] As such, PUC members are subject to many of the same limitations as judges, including a limited ability to engage in independent fact-finding[286] and a general restriction from engaging in *ex parte* communications during a formal decision-making process or with any party outside of a PUC hearing.[287] These limits on *ex parte* communications protect the due process rights of the parties and maintain transparency of the hearing process by allowing opposing parties the opportunity to hear and respond to information presented to the commissioners.[288] However, rules against *ex parte* communications can create a barrier to commissioners consulting with expert environmental staff on issues that arise during proceedings, such as whether more stringent future regulations are likely or what an existing rule currently requires.[289]

B. Lack of Policy Coordination

The state's organizational structure may also fail to encourage—or may even discourage—communication between utilities and environmental regulators on issues of mutual concern, hindering fully informed decision making and collaborative problem solving that can reduce overall costs for consumers. For example, utility commissioners may not be aware of impending environmental regulations or regulations

284. MIKE BULL, MINN. HOUSE RESEARCH DEP'T, THE MINNESOTA PUBLIC UTILITIES COMMISSION AND RELATED AGENCIES: STRUCTURE AND FUNCTION 7 (2002), *available at* http://www.ictregulationtoolkit.org/en/Document.1438.pdf; Fitzpatrick, *supra* note 46, at 106, 109–10.

285. Gerald E. Dahl, *Advising Quasi-Judges: Bias, Conflicts of Interest, Prejudgment, and Ex Parte Communications*, COLO. LAW., Mar. 2004, at 69, 69.

286. *Id.*

287. *Id.* at 71.

288. *Id.*

289. GORMLEY, JR., *supra* note 5, at 32. For example, South Carolina prohibits *ex parte* communications between a commissioner or commission employee and any "public or elected official." S.C. CODE ANN. § 58-3-260(B) (Supp. 2011).

that are required by statute but may take longer periods of time for the EPA to promulgate, such as the Utility MATS rule. This knowledge gap may prevent PUCs from considering opportunities for utilities to make investments that will help achieve existing or future environmental goals.

C. The Challenge of Regulatory Uncertainty in the Public Utility Commission Context

PUCs, especially those overseeing traditionally regulated markets with utilities operating as monopolies, face a significant challenge when assessing regulatory uncertainty. A primary function of the PUC is to ensure that electric utilities provide affordable, reliable electricity, and to provide a check on utilities' monopoly power.[290] The PUC sets rates based on the amount of capital invested by the utility to serve customers, plus a fair rate of return.[291] One way for a utility to increase profits is to get a higher rate of return approved.[292] The other way is to increase the amount of capital invested, including investments in pollution control technology or more expensive but cleaner generating technology.[293] If a PUC allows a utility to justify a more expensive capital investment in anticipation of future greenhouse gas emission limits, for example, the utility will then pass the cost of that investment along its customers.[294] Utilities, therefore, may have an incentive to exaggerate the likelihood of future regulation in order to increase the return for shareholders—a practice commonly referred to as "gold-plating."[295] As a result, PUCs are often unwilling, or unable, to take regulatory uncertainty into account when evaluating a utility's capital investment plan, even if hedging that uncertainty would be in the best interest of its customers over the long term.

VI. THE TRIPLE BOTTOM LINE APPROACH FOR ELECTRIC UTILITY REGULATION

A more coordinated, informed decision-making process among state actors could improve outcomes across the three related goals of affordable electricity, reliable electricity, and protection of public health

290. *See supra* Part II.A (broadly describing the function of state public utility commissions).

291. Martha L. Louder et al., *Market Valuation of Regulatory Assets in Public Utility Firms,* 71 ACCT. REV. 357, 359 (1996).

292. AYNSLEY KELLOW, TRANSFORMING POWER: THE POLITICS OF ELECTRICITY PLANNING 22 (1996).

293. *Id.*

294. Louder et al., *supra* note 291, at 359.

295. KELLOW, *supra* note 292, at 22.

and the environment. A TBL approach to state electric utility regulation built around the following three simple, measurable policy objectives can provide a framework for evaluating the interactions between energy, environmental, and consumer protection goals:

> (1) Affordability—electricity prices should remain at a level that allows individual consumers to power their homes and allow a healthy business sector;
>
> (2) Reliability—the electricity grid should deliver a sufficient amount of electricity to meet demand; and
>
> (3) Protect Public Health and the Environment—the electricity sector should minimize or eliminate harmful pollutants, including GHG emissions.

The TBL concept in its most general form is an effort to encourage private corporations to take a more holistic view of business impacts and value by measuring a firm's social and environmental impacts in addition to financial health.[296] Based on the principle of "what you measure is what you get, because what you measure is what you are likely to pay attention to," TBL reporting encourages business sustainability by changing how business leaders view value.[297] Today, the TBL approach is not only a set of voluntary business practices, but has become a common criterion for private and public sector efforts to incorporate sustainability into decision making.[298]

The TBL approach proposed in this Article does not focus on creating new policy goals, but rather on optimizing state-level policy goals and mandates that already exist. States currently seek to maintain healthy air quality, maintain electricity rates that consumers can afford, and ensure a

296. JOHN ELKINGTON, CANNIBALS WITH FORKS: THE TRIPLE BOTTOM LINE OF 21ST CENTURY BUSINESS 69–94 (1997); Tim Hindle, *Triple Bottom Line—It Consists of Three Ps: Profit, People, and Planet*, THE ECONOMIST (Nov. 19, 2007), http://www.economist.com/node/14301663.

297. Hindle, *supra* note 296.

298. *See, e.g.*, Philip L. Comella, *Acquiring or Selling the Privately Held Company 2011*, *in* CORPORATE LAW AND PRACTICE COURSE HANDBOOK SERIES 241, 258 (2011) ("Many major companies are now focusing, at least as a matter of policy, on what is called the 'triple bottom line': financial, social, and environmental responsibilities."); Makena Coffman & Karen Umemoto, *The Triple-Bottom-Line: Framing of Trade-Offs in Sustainability Planning Practice*, 12 ENVTL. DEV. & SUSTAINABILITY 597, 599 (2010); Timothy F. Slaper & Tanya J. Hall, *The Triple Bottom Line: What Is It and How Does It Work?*, 86 IND. BUS. REV. 4, 4 (2011) ("Interest in triple bottom line accounting has been growing across for-profit, nonprofit and government sectors. Many businesses and nonprofit organizations have adopted the TBL sustainability framework to evaluate their performance, and a similar approach has gained currency with governments at the federal, state and local levels.").

reliable electricity grid, and they are largely successful with all three goals. Rather than propose that state governments reorient decision making around sustainability, what is needed is better coordination, information sharing, and evaluation criteria which ensure that each state agency responsible for regulating an aspect of electric utility operations does so in a manner that facilitates achievement of the full suite of goals rather than one or two of the three TBL pillars. The TBL approach proposed here includes processes, information sharing, and individual decision evaluation to ensure that actions at various agencies contribute to a consistent approach or, at the very least, do not frustrate achieving the three broad goals defined here.

In practice, making the TBL approach operational in the utility sector requires: (1) long-term planning that accounts for potential shifts in the relative cost of generation technologies over time, including shifts that result from new environmental regulations; (2) allowing utilities to make the investments necessary to meet demand and providing the opportunity to earn a rate of return sufficient to attract low-cost capital; and (3) maintaining a diverse portfolio that includes energy efficiency and long-term power purchase agreements for renewable energy to hedge against potential increases in the cost of fossil-fuel fired electricity.

With an understanding of how the multiple agencies and policy objectives interact to influence utility investments, consumer electric bills, and environmental quality, states can be more deliberate about that interaction to improve outcomes on all three pillars of the TBL. Specific opportunities to act fall into four broad strategies: (1) sharing information among state regulators overseeing electric utility operations; (2) considering future environmental regulations when planning for utility investments; (3) creating mandates or incentives for energy efficiency or diversification of generation resources that hedge against fuel or compliance cost increases; and (4) providing regulatory certainty through state law.

A. Sharing Information Across State Agencies

Information sharing among regulators who oversee different aspects of utility operations—and who are primarily responsible for different aspects of the TBL approach—can create more informed decision making and greater consistency across state agencies.[299] For instance, PUCs may incorporate state environmental regulators' expertise when

299. *See supra* Part IV.B.3 (describing the information sharing requirements of the Colorado Clean Air-Clean Jobs Act).

determining whether a proposed pollution control investment constitutes prudent planning or unnecessary gold-plating. Similarly, PUC members with expertise in long-term planning processes by utilities may help inform state regulators in creating state air quality plans. State agencies can share information in a number of ways, some of which agencies could pursue under their current mandates and others that might require action within the state legislature. Information sharing may take many forms, including regularized written reports, regular interaction, formal testimony before PUC members, and agency reorganization.

1. Reports

PUCs, environmental agencies, and state energy offices could transmit information through written reports. Just as agencies may submit regular reports to state legislatures,[300] state energy and environmental agencies could report to each other via written reports on a regular basis. The abundance of decentralized information that energy and environmental regulators currently produce,[301] combined with resource constraints, can make it difficult for regulators to efficiently identify the information that is most relevant to a specific decision-making process. Interagency reports, however, might make it easier for individuals to identify and access pertinent TBL information that improves decision making. Interagency reports would include summaries of recent dockets and rulemakings, data on efficiency or renewable energy incentive programs, and forecasts of upcoming dockets or new rules. Importantly for PUCs, these reports would identify future issues before they are raised in dockets and thus subject to rules of *ex parte* communications.

In addition to annual reports, environmental regulators could also produce reports for specific PUC proceedings. For example, a report might analyze the impact of a proposed facility on state NAAQS compliance, future regulations that that may impact the new facility, and the range of options to mitigate environmental impacts. The regulators would avoid *ex parte* concerns by: (1) making these reports available to all parties and potentially to the public; or (2) by bringing in

300. For example, the North Carolina Clean Smokestacks Act requires the North Carolina Utilities Commission and Division of Air Quality to submit annual reports to the legislature on implementation of the Act. *See* N.C. GEN. STAT. § 143-215.108 (2011).

301. For example, utility regulators require utilities to periodically develop long term resource plans while the EPA regularly conducts extensive scientific reviews of air quality standards. *See infra* Part VI.B.1 (describing integrated resource planning); *see also Final Reports by Fiscal Year,* EPA, http://yosemite.epa.gov/sab/sabproduct.nsf/WebReportsbyYear CASAC!OpenView (last visited Jan. 5, 2013) (cataloguing the EPA's scientific reviews of air quality standards from 1979 to 2013).

environmental regulators as intervenors in the proceeding, following the common precedent of a state entity representing the consumers' interests in the PUC hearing process.

2. Regular Interaction Among Political Appointees and Staff at the Public Utility Commission and State Agencies

Regular meetings between utility commissioners, agency administrators, and staff would also facilitate information sharing and build a rapport between state agencies. These meetings would provide a forum for informal discussions of shared challenges,[302] a chance to identify areas where agencies may be able to help each other,[303] and a place for administrators and staff to build relationships.[304] Interagency meetings would also include joint training sessions, in which administrators and staff from all three agencies would learn about new policies and programs, develop new skills, and inform each other about their own areas of expertise. Research on multi-agency cooperation in other sectors suggests that joint training and team building exercises are common characteristics of successful efforts.[305] Other keys to success include strong leadership, staff morale, clear planning processes, and a supportive and respective institutional culture.[306] Interagency meetings should aim to achieve these milestones.

302. For example, all three agencies confront similar challenges in predicting the future impact of renewable energy and energy efficiency policies on electricity demand: PUCs during long-term planning processes, in rate cases when intervenors propose that efficiency can make new capacity unnecessary, and when determining lost revenue requirements associated with energy efficiency investments; environmental agencies in air quality planning; and state energy offices when evaluating the performance of state-led efficiency programs. *See National Action Plan on Energy Efficiency,* EPA, http://www.epa.gov/cleanenergy
/energy-programs/suca/resources.html (last updated Oct. 17, 2012).

303. DAVID FARNSWORTH, REGULATORY ASSISTANCE PROJECT, PREPARING FOR EPA REGULATIONS: WORKING TO ENSURE RELIABLE AND AFFORDABLE ENVIRONMENTAL COMPLIANCE 39 (2011), *available at* http://www.raponline.org/document/download/id/
919.

304. Noting the value of shared information and interagency relationships, the National Associations of Clean Air agencies ("NACAA"), State Energy Officials ("NASEO"), and Regulatory Utility Commissions ("NARUC") encouraged member agencies to meet regularly within their state at a joint conference in Washington, DC on July 9–10, 2012. *See* ENVIRONMENTAL PROTECTION & CLEAN RELIABLE ENERGY: GOVERNMENTS WORKING TOGETHER, AGENDA (n.d.), *available at* http://www.narucmeetings.org/EventDocuments/
3NAgenda1.pdf (detailing events at the joint conference).

305. Patricia Sloper, *Facilitators and Barriers for Co-Ordinated Multi-Agency Services*, 30 CHILD: CARE, HEALTH & DEV. 571, 575–76 (2004).

306. *Id.*

3. Testimony

Because PUCs are quasi-judicial bodies, formal testimony carries great weight at PUC hearings. State environmental regulators and energy officials may hesitate to testify for a number of reasons,[307] but their testimony at PUC proceedings would provide a foundation in the record that commissioners could rely on to evaluate utility decisions against the state's TBL objectives. Various industries, consumers, environmentalists, and other special interests already intervene regularly at PUC proceedings,[308] and while consumer advocate designated by the state argues for affordable and reliable electricity,[309] there is rarely a party officially representing the state's public health and environmental goals. However, Colorado experimented with an alternative to this participatory scheme when it required the state's environmental agency to guide the Colorado PUC in determining whether the utilities' CACJA compliance plans were "consistent with existing and reasonably foreseeable [environmental] requirements."[310] States could follow Colorado's lead by requiring environmental regulators and energy officials to testify as expert witnesses at all relevant PUC proceedings, such as proposals to install pollution controls, to implement new energy efficiency programs, or to build new power plants. In exchange, utility regulators and their staffs could also offer valuable insight on environmental rulemakings. PUCs could offer formal comments concerning the feasibility, costs, and other important factors of proposed rules into environmental agencies' formal decision-making processes.

4. Reorganize to Streamline Goal Setting, Accountability, and Communication

Finally, states could consider reorganizing state agencies to streamline the process of setting goals, accountability, and communication.

307. For example, environmental regulators may be concerned with the political implications of testifying, or not have the time and resources to participate.

308. *See, e.g.*, Jeffry Pollock, *Electric Utility Regulation: Procedures, Parameters, and Current Issues from an Intervenor's Perspective*, *in* INDUSTRY APPLICATIONS SOCIETY 37TH ANNUAL PETROLEUM & CHEMICAL INDUSTRY CONFERENCE 65, 67 (1990) (describing the interests and opportunities for industrial intervenors in utility rate cases); James M. Van Nostrand & Erin P. Honaker, *Preserving the Public Interest Through the Use of Alternative Dispute Resolution in Utility Retail Rate Cases*, 27 PACE ENVTL. L. REV. 227, 230, 245 (2009) (describing the presence and role of special interest intervenors in rate cases).

309. Vaughan, Jr. & Sharpe, *supra* note 270, at 390 (noting that in most states, the Attorney General's office is responsible for representing consumer interests).

310. COLO. REV. STAT. ANN. § 40-3.2-204 (West 2004 & Supp. 2012).

Massachusetts[311] and Connecticut[312] implemented reorganizations in 2007 and 2011, respectively, to unite their PUCs, energy offices, and environmental agencies within a single department. In both states, the new departments of energy and environment boast a mission of achieving TBL objectives described here.[313] Two years after the reorganization Ken Kimmell—then General Council for the Massachusetts Executive Office of Energy and Environmental Affairs—and his co-author Lorie Burt described the effort as a success: "Instead of competing for resources and attention [the Massachusetts Department of Environmental Protection] and the Department of Energy Resources are working together to achieve the same broad policy goals."[314]

States have received mixed results, however, from past efforts to reorganize and streamline multiagency objectives such as child welfare, health care, and education[315] through the merger of different agencies or the creation of specialized interagency teams. For example, human services employees in Florida reported progress toward integration of services and improved client services following reorganization in 1975, which aimed to more adequately cover clients with multiple problems.[316] While some states may benefit from joint leadership and regular interaction among key actors, reorganization can also be disruptive. Reorganization sometimes requires employees to relocate within the organization or to a different physical location.[317] As a result, employees may need to develop new relationships and communication patterns to perform their normal tasks, in addition to the new relationship and communication patterns needed to implement the TBL approach. As such, other states may find that it is less disruptive to pursue interagency coordination within their existing structure.

311. MASS. ANN. LAWS ch. 21A, § 1 (LexisNexis 2007 & Supp. 2012).

312. CONN. GEN. STAT. ANN. § 22a-1a (West 2007 & Supp. 2012).

313. *About Us: Executive Office of Energy and Environmental Affairs,* MASS.GOV, http://www.mass.gov/eea/utility/about-us.html (last visited Jan. 27, 2013); *About Us*, DEP'T ENERGY & ENVTL. PROT., http://www.ct.gov/dep/cwp/view.asp?a=2690&q=322476&depNav_GID=1511 (Jan. 27, 2013).

314. Ken Kimmell & Laurie Burt, *Massachusetts Takes on Climate Change,* 27 UCLA J. ENVTL. L. & POL'Y 295, 298 (2009).

315. *See, e.g.*, Larry Polivka et al., *Human Services Reorganization and Its Effects: A Preliminary Assessment of Florida's Services Integration 'Experiment'*, 41 PUB. ADMIN. REV. 356, 356–65 (describing the relative success of reorganization); Sloper, *supra* note 305, at 572 (describing the difficulty of achieving successful multi-agency coordination in the health, education, and social services sectors).

316. *See* Polivka et al., *supra* note 315, at 356–65.

317. *See generally* Rufus. E. Miles, *Considerations for a President Bent on Reorganization*, 37 PUB. ADMIN. REV. 155 (1977) (describing factors that a President should consider when deciding whether to reorganize federal agencies).

B. Considering Future Environmental Regulation In Investment Planning

As the examples described above of recent decisions in Indiana, West Virginia, and Mississippi demonstrate,[318] PUCs can incorporate future environmental requirements into their evaluations of utility investments, applying the TBL approach through the lens of long-term affordability. PUCs engage in two processes that the TBL can inform: long-term planning (often called "integrated resources planning") and individual investment proposals.

1. Integrated Resource Planning Process

Most states with traditional regulation require utilities to develop long-term planning documents called Integrated Resource Plans ("IRPs").[319] IRPs combine a utility's long-term demand forecasts with scenarios for meeting that demand, including the utility's preferred portfolio.[320] States typically require utilities to consider both demand-side strategies (for example, energy efficiency at the residential and industrial levels) and supply-side strategies (for example, energy efficiency at the utilities' level).[321] The level of involvement of the state's PUC and the frequency with which utilities must update their IRPs varies by state,[322] but the IRP process is generally an appropriate venue for both utilities and regulators to explore the risk of making low-cost investments today that could become expensive to operate under potential future scenarios. Utilities and regulators routinely evaluate other types of risk through their IRPs, including fuel price volatility and extreme weather.[323] In many states, utilities already incorporate estimates of future carbon prices into some scenarios to account for future climate policy risk.[324] If utilities are not already sufficiently evaluating the potential for future climate policy or

318. *See supra* Part IV.A.

319. *See generally* RACHEL WILSON & PAUL PETERSON, SYNAPSE ENERGY ECON., INC., A BRIEF SURVEY OF STATE INTEGRATED RESOURCE PLANNING RULES AND REQUIREMENTS (2011), *available at* http://www.cleanskies.org/wp-content/uploads/2011/05/ACSF_IRP-Survey_Final_2011-04-28.pdf.

320. *Id.*

321. *Id.*

322. WILSON & PETERSON, *supra* note 319, at 7–8.

323. Karl Bokenkamp et al., *Hedging Carbon Risk: Protecting Customers and Shareholders from the Financial Risk Associated with Carbon Dioxide Emissions*, 18 ELECTRICITY J., July 2005, at 11, 12.

324. *See generally* GLEN BARBOSE ET AL., ERNEST ORLANDO LAWRENCE BERKELEY NAT'L LAB., READING THE TEA LEAVES: HOW UTILITIES IN THE WEST ARE MANAGING CARBON REGULATORY RISK IN THEIR RESOURCE PLANS (2008), *available at* http://emp.lbl.gov/sites/all/files/REPORT%20lbnl-44e_0.pdf.

other reasonably likely future environmental requirements, PUCs that have authority to approve (or disapprove) utility IRPs under state law could request that utilities incorporate different levels of environmental policy stringency into their IRP scenarios.[325] In other states, new legislation could establish the requirement that environmental regulators comment on a utility IRP to help the PUC determine whether the utility sufficiently addresses likely future requirements. Colorado's CACJA compliance planning process provides a model for this type of interaction.[326]

2. Specific Utility Investments

As the previously described examples in Indiana, West Virginia, and Mississippi demonstrate, PUCs have some latitude to consider the impacts of specific investment decisions on state public health and the environmental goals when evaluating specific utility proposals.[327] If PUCs interpret their responsibility to protect the public convenience and necessity to include the long-term availability of affordable and reliable energy in their state, it is appropriate to consider the impacts of likely future policies that address the state's third TBL pillar—a healthy environment.[328] This need is especially acute in the context of the long life cycle of most utility investments and in view of the history of increasingly stringent environmental requirements.[329] Maintaining a balanced energy portfolio is critical to successfully implementing this approach. Just as the Mississippi PUC determined that the state's heavy reliance on natural gas put consumers at risk and justified an investment in an IGCC coal facility, other PUCs may find that an overreliance on other technologies that are likely to face new regulations is not good for consumers.[330]

325. WILSON & PETERSON, *supra* note 319, at 7–8 (PUCs give varying amounts of weight to certain resources and operate under different planning horizons that may correspond to stronger or weaker regulatory regimes.)

326. COLO. REV. STAT. ANN. §§ 40-3.2-203(2), -204(2)(b) (West 2004 & Supp. 2012).

327. *See supr*a Part III (describing the relationship between environmental regulations and consumer prices and the prudence of considering future environmental regulations in electricity infrastructure decisions).

328. *Id.*

329. *Id.*

330. *See* sources cited *supra* notes 213–30 and accompanying text (describing the Mississippi PSC's decision to approve a IGCC coal-fired power plant).

C. Creating Mandates or Incentives for Energy Efficiency or Diversification of Generation Resources That Hedge Against Fuel or Compliance Cost Increases

Energy efficiency measures and renewable energy technologies are important tools to mitigate uncertainty and environmental risk in the electricity sector.[331] Energy efficiency and conservation measures allow utilities to delay investments in new generation, and the development of renewable energy resources reduces overreliance on traditional technologies, thereby diversifying the sources of electricity supply and enhancing energy security.[332] Twenty-nine states have adopted renewable portfolio standards ("RPSs") that diversify electricity supply with a minimum level of renewable resources, though policy design and scope vary substantially across states.[333] There are also many well-documented efforts and opportunities to encourage greater reliance on energy efficiency, including actions outside of the electricity sector such as updating and enforcing building codes and setting appliance efficiency standards,[334] and actions within the electricity sector such as energy efficiency resource standards and innovative rate design.[335] The state energy offices could provide a bridge between these various regulatory

331. *See* BINZ ET AL., *supra* note 14, at 8, 10.

332. *See* DAVID HOPPOCK & JONAS MONAST, DUKE UNIV. CLIMATE CHANGE POL'Y P'SHIP, RESIDENTIAL ENERGY EFFICIENCY AND THE AMERICAN CLEAN ENERGY AND SECURITY ACT H.R. 2454, at 7 (2009), *available at* http://www.nicholas.duke.edu/ccpp/ccpp_pdfs/ree.07.08.09 .pdf (describing the effects of increased energy efficiency including delayed power plant investments and hedging against fuel price volatility).

333. *See* Ryan Wiser et al., *The Experience with State Renewable Portfolio Standards in the United States*, 20 ELECTRICITY J., May 2007, at 8, 9; *see also RPS Policies Summary Map*, DATABASE OF STATE INCENTIVES FOR RENEWABLES AND EFFICIENCY, http://www.dsireusa.org/summarymaps /index.cfm?ee=1&RE=1 (last visited Jan. 27, 2013) (providing an updated list of state RPS policies).

334. HOPPOCK & MONAST, *supra* note 332, at 9 (describing California's success with building code improvements and appliance efficiency standards).

335. Regulators can adopt "decoupling" mechanisms that periodically adjust rates to make up for deviations from the level of sales projected during the last rate case, thereby eliminating any revenue losses due to energy efficiency gains and extra profits from increased energy sales. *See* Jay Zarnikau, *The Many Factors that Affect the Success of Regulatory Mechanisms Designed to Foster Investments in Energy Efficiency*, 5 ENERGY EFFICIENCY 393, 393 (2011) ("The reduction in profitable sales resulting from energy efficiency poses a disincentive to utility investments in energy efficiency. Regulatory schemes have been devised to remove this disincentive, including lost revenue adjustment mechanisms (LRAMs), decoupling mechanisms, and shareholder bonuses."). Shared incentive mechanisms go one step further to compensate the utility for the opportunity cost of foregone capacity investments due to decreases in demand. Larry Blank & Doug Gegax, *Objectively Designing Shared Incentive Mechanisms: An Opportunity Cost Model for Electric Utility Efficiency Programs*, 24 ELECTRICITY J., Nov. 2011, at 31, 31–32 (describing shared incentive mechanisms). Similarly, states may offer utilities annual lump-sum rewards for achieving energy efficiency goals, such as 0.5% annual reduction in per capita energy use. *See id*.

processes—soliciting feedback from interested agencies across the state government, ensuring that energy efficiency and energy diversification efforts are consistent with other state energy goals, as well as identifying opportunities for cost-effective environmental compliance.

Some of these opportunities, such as innovative rate design, fall within the purview of the PUC.[336] State energy offices are likely responsible for implementing others,[337] and establishing many of these initiatives requires state legislatures to act. For example, most states with an RPS have adopted the policy through legislation, though a few have relied on regulatory or voter-approved initiatives.[338] States may also allow utilities to earn credit for energy efficiency as part of their renewable energy standard or adopt a separate energy efficiency resource standard that requires utilities to meet a percentage of demand through energy efficiency.[339] States have adopted energy efficiency resource standards through legislation, rulemaking, and through contracts between utilities and PUCs.[340]

The crossover between PUCs, state energy offices, state environmental agencies, and the legislative responsibilities for energy efficiency and renewable energy programs again underscores the need for interagency communication and information sharing. In particular, while energy efficiency and conservation measures represent a large, cost-effective energy source that should play an increasingly important role in meeting electricity demand, implementing successful energy efficiency programs is difficult because of a number of social, regulatory, and financial barriers.[341] Coordination and communication between various agencies responsible for such programs could help enhance the role of energy

336. COLUMBIA LAW SCH. CTR. FOR CLIMATE CHANGE L., PUBLIC UTILITY COMMISSIONS AND ENERGY EFFICIENCY: A HANDBOOK OF LEGAL AND REGULATORY TOOLS FOR COMMISSIONERS AND ADVOCATES 47 (2012), *available at* https://www.law.columbia.edu/Null /download?&exclusive=filemgr.download&file_id=611933.

337. *See supra* Part II.C (describing the role of state energy offices).

338. Ryan Wiser et al., *supra* note 333, at 9.

339. STEVEN NADEL, AM. COUNCIL FOR AN ENERGY EFFICIENT ECON., ACEEE REPORT E063, ENERGY EFFICIENCY RESOURCE STANDARDS: EXPERIENCE AND RECOMMENDATIONS 1 (2006), *available at* http://www.aceee.org/sites/default/files/publications/researchreports/ e063.pdf.

340. *Id.*

341. EPA, NATIONAL ACTION PLAN ON ENERGY EFFICIENCY VISION FOR 2025: A FRAMEWORK FOR CHANGE ES-2 (2008), *available at* http://www.epa.gov/cleanenergy/documents/suca/ vision.pdf (stating that energy efficiency could meet fifty percent of load growth through 2025 and suggesting steps that must be taken to realize this potential, including valuing energy efficiency similar to supply side options and aligning financial incentives for utilities, investors, and customers).

efficiency and conservation measures in achieving the state's TBL objectives.

D. Providing Regulatory Certainty Through State Law

Historical trends suggest that environmental regulations will become increasingly stringent over time, but the timing and optimal compliance strategy of likely requirements is difficult to predict.[342] However, as discussed in the examples cited above, states can create policy certainty that allows utilities to make strategic investments ahead of future federal environmental regulations when state public health and environmental goals supersede federal priorities.[343] In this regard, North Carolina's Clean Smokestacks Act and Colorado's Clean Air-Clean Jobs Act are good examples of state policies that simultaneously address all three TBL objectives in the utility sector.

State policies that allow utilities to act early must be carefully designed to support all three TBL pillars. Compliance flexibility (which, for example, does not mandate a particular pollution control strategy) and long compliance timelines are key design elements.[344] Together, those approaches allow utilities to adjust their pollution control strategy as they learn more about the future, including the likely impacts of federal regulations and fuel price trends.[345] Well-designed policies should also reflect state-level public health and environmental goals independent from federal priorities. While identifying strategic opportunities to act early is no simple task, states can improve their ability to do so by facilitating communication between the various state actors that influence electric utilities, such as through many of the information sharing strategies suggested above. Collaboration between utilities, utility regulators, environmental regulators, NGOs, and elected officials was critical to the design and passage of such legislation in North Carolina and Colorado.[346]

342. *See supra* Parts V.B.1–3.

343. *See supra* Part IV.B.

344. HOPPOCK ET AL., *supra* note 24, at 3.

345. *Id.*

346. *See, e.g.*, William G. Ross, Jr., *North Carolina's Clean Smokestacks Act*, N.C. DEP'T OF ENV'T AND NATURAL RES., http://daq.state.nc.us/news/leg/cleanstacks.shtml (last modified May. 13, 2009) ("One of the biggest reasons for the bill's passage was the involvement of various stakeholders in developing the legislation. Negotiations included representatives from power companies, environmental groups, the legislature, the governor's office, state agencies, electric rate payers' associations, non-utility industry groups and the state utilities commission.").

VII. CONCLUSION

This Article proposes a TBL approach to energy and environmental decision making. While the original TBL concept sought to change the way businesses and governments measure value—adding social and environmental considerations to traditional economic measures—the TBL approach envisioned here asks decision makers to integrate *existing* public policy goals. States currently seek to provide affordable electricity, reliable electricity, and a healthy environment by delegating elements of these interrelated public policy goals to PUCs, environmental agencies, and energy offices that rarely interact. Integrating these state objectives in a TBL approach would reveal opportunities to coordinate efforts and improve outcomes. Recent events in states as diverse as Massachusetts, Colorado, Indiana, and Mississippi have shown that the TBL approach is compatible with existing state goals and agency mandates. Coordinating efforts to achieve the three pillars of affordable electricity, reliable electricity, and a healthy environment would help regulators cope with the large energy investment needs and the significant uncertainties surrounding the development of the electricity sector today.