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ELECTRICITY COMPETITION AND THE PUBLIC GOOD: RETHINKING MARKETS AND MONOPOLIES

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The United States electricity sector is engaged in a long-term experiment regarding the proper role of market competition. Many states that transitioned to competitive electricity markets in the early 2000s are again reconsidering the relationship between market competition and public policy goals. Low natural gas prices, falling costs of renewable energy and energy storage, and improvements in efficiency are causing early retirements of coal and nuclear power plants and thus affecting environmental policy goals and economic interests. States that continue to rely on monopoly utilities for electricity are also reconsidering the role of competition, but from a different angle. Rather than focusing on mitigating the downsides of competition, some traditionally regulated states are creating new opportunities for third parties to compete with monopoly utilities.

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The implications for electricity sectors in restructured and traditionally regulated states extend far beyond the particular facilities that stand to gain from new subsidies or the monopoly utilities subject to new forms of competition. Post hoc changes to market rules risk wasting resources that will be necessary to aggressively reduce greenhouse gas emissions, ensure long-term affordability, and mitigate the employment impacts of a transitioning sector.

This Article explores the factors causing policymakers to reconsider the role of competition in the pursuit of energy goals. It identifies lessons for realizing the benefits of electricity sector competition while managing the downsides that occur during periods of unanticipated change. In restructured markets, the lessons center on strategies to address job losses and achieve state environmental goals. In traditionally regulated states, the lessons focus on opportunities to harness competition to deliver additional societal benefits without undermining the traditional rate-setting model for monopoly utilities.

INTRODUCTION

Are markets or monopolies better suited to deliver affordable, reliable, and clean electric power? A long-term experiment is underway in the U.S. electricity sector to answer the question.

Historically, states relied on public utilities—vertically integrated monopolies that own electricity generation, transmission, and distribution systems—to provide affordable and reliable electric power.[1] The federal government started creating opportunities for competition among wholesale electricity generators in the 1970s. Some states took more dramatic steps to foster electricity-sector competition in the 1990s and early 2000s by transitioning away from vertically integrated utilities. Policymakers in these states believed competition would deliver lower electricity prices, better environmental outcomes, and greater opportunities for innovation.[2] Other states continued to rely on traditional electric utilities, trusting the established monopoly model to continue delivering affordable and reliable electricity.[3]

Recent developments are causing policymakers to once again consider the balance between competitive markets, monopolies, and financial support for certain facilities. Some

1. DAVID P. TUTTLE ET AL., THE HISTORY AND EVOLUTION OF THE U.S. ELECTRIC INDUSTRY 2–3 (2016), http://sites.utexas.edu/energyinstitute/files/2016/09/UTAustin_FCe_History_2016.pdf [https://perma.cc/M8TZ-FZHZ].

2. *See, e.g.*, ELIZABETH B. STEIN & FERIT UCAR, ENVTL. DEF. FUND, DRIVING ENVIRONMENTAL OUTCOMES THROUGH UTILITY REFORM 6–9 (Jan. 2018), https://www.edf.org/sites/default/files/documents/driving-environmental-outcomes.pdf [https://perma.cc/P3AY-BKE9].

3. TUTTLE ET AL., *supra* note 1, at 3.

states that embraced competitive markets are now grappling with whether, and how, to control the downsides of competition. Many nuclear and coal-fired power plants are struggling to remain profitable in competitive markets, due primarily to low natural gas prices.[4] Some states have responded with new programs to compensate nuclear facilities for their role in providing carbon-free electricity.[5] The Trump administration has proposed subsidizing economically vulnerable coal and nuclear facilities, justifying the move as necessary to ensure grid reliability.[6] These strategies differ significantly from one another in both their underlying policy goals and the data supporting them. Without subsidies for nuclear power plants, states will be unable to meet their respective decarbonization goals.[7] In contrast, the Trump administration is promoting subsidies for coal and nuclear facilities despite the lack of evidence that the facilities are necessary for reliability.[8] Although there are important differences between the state and federal efforts, they share an important trait: each attempts to insulate certain power plants from competitive pressures.

States with monopoly utilities face a different set of questions. Rather than focusing on mitigating the downsides of competition, some traditionally regulated states are now exploring mechanisms to realize the benefits of competition while

4. Ari Natter, *Coal Plants Keep Shutting Despite Trump's Order to Rescue Them*, BLOOMBERG (June 18, 2018), https://www.bloomberg.com/news/articles/2018-06-18/coal-plants-keep-shutting-despite-trump-s-order-to-rescue-them [https://perma.cc/YFR6-GSC8]; *see also* Sonal Patel, *More Premature Nuclear Unit Retirements Loom*, POWER (Feb. 1, 2018), https://www.powermag.com/more-premature-nuclear-unit-retirements-loom/ [https://perma.cc/QJ3S-4CBV].

5. DANIEL SHEA & KRISTY HARTMAN, NAT'L CONF. OF STATE LEGISLATURES, STATE OPTIONS TO KEEP NUCLEAR IN THE ENERGY MIX 21–27 (Jan. 2017), http://www.ncsl.org/Portals/1/Documents/energy/StateOptions_NuclearPower_f02_WEB.pdf [https://perma.cc/5AC4-Z2EQ].

6. Brad Plumer, *Trump Orders a Lifeline for Struggling Coal and Nuclear Plants*, N.Y. TIMES (June 1, 2018), https://www.nytimes.com/2018/06/01/climate/trump-coal-nuclear-power.html [https://perma.cc/C3CB-LXXE].

7. Russell Gold, *Utility Jobs Lost as New Power Plants Need Fewer Workers*, WALL ST. J. (Jan. 16, 2018), https://www.wsj.com/articles/utility-jobs-shrink-as-new-power-plants-need-fewer-workers-1516021200 [https://perma.cc/6AWJ-TVXW]; *see also* Brad Plumer, *How Retiring Nuclear Power Plants May Undercut U.S. Climate Goals*, N.Y. TIMES (June 13, 2017), https://www.nytimes.com/017/06/13/climate/nuclear-power-retirements-us-climate-goals.html [https://perma.cc/XM57-4UFX].

8. *See infra* Section III.B.

also preserving the cost-of-service model.[9] Strategically harnessing competition to enhance utilities' accountability, responsiveness to consumer demands, and risk management practices can help protect ratepayers in the face of uncertain futures.

Post hoc changes to rules for electricity-sector competition not only impact market participants but also risk wasting resources that will be necessary to aggressively reduce greenhouse gas emissions, ensure long-term affordability, and mitigate employment impacts of a transitioning sector. The changing approaches to competition also call into question the socially beneficial makeup of the electricity sector and the proper balance between competition and regulation.

Numerous scholars are exploring the important jurisdictional implications of these state and federal market interventions.[10] These inquiries focus on who may—or who should—establish energy policy goals and create the rules necessary to achieve them. The "who decides" question is a critical element in the energy policy debate, evidenced by the dramatic shift in federal policy priorities as the Trump administration seeks to overturn much of the Obama administration's environmental regulations. Resolving jurisdictional arguments, however, would only address one aspect of the regulatory uncertainty hanging over electricity-sector stakeholders. Federal and state policymakers may pursue different choices if given broader authority over the sector, but both are second-guessing the proper role of competition in achieving energy policy goals. This perspective is not limited to one political ideology or to one region of the country, and jurisdictional certainty will not resolve questions regarding the proper role of market competition.

This Article argues that competition can play an important role in achieving societal benefits in restructured and traditionally regulated states.[11] Doing so, however, requires proactive

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9. *See infra* Part IV. "Cost of service" refers to compensating electric utilities for the cost of providing the service plus a rate of return that allows the company to attract investors and satisfy debt obligations.

10. *See infra* Part I.

11. Electricity markets take many forms, and it is not the goal of this Article to explore each. Furthermore, the distinctions between competitive electricity markets and traditionally regulated electricity markets are not absolute. States do not rely solely on one model or the other. Bilateral contracts, participation in wholesale electricity markets, renewable energy mandates, and fixed infrastructure costs are just some examples of the interactions between electricity markets and public policy across the country. Yet these recent changes signal a

strategies that address the downsides of competition. Electricity market choices have social costs. These costs are reflected in electricity rates and the state's resulting ability to attract and retain energy-intensive industries. They are also reflected in the job losses and related public health impacts in communities dependent on coal-fired generation, as well as the ongoing health and environmental costs associated with fossil-fuel-fired generation.

There are models for incorporating these social and environmental goals more directly into electricity governance. For example, many states that opted into competitive electricity markets in the early 2000s implemented a "competitive transition charge" to compensate utilities for any sunk costs that they could not otherwise recover.[12] A similar approach could fund economic development and job retraining efforts in communities suffering job losses as older power plants retire. The Federal Power Act and state utility laws are generally broad enough to allow greater consideration of environmental policy impacts. In traditionally regulated states, policymakers are already experimenting with new forms of electricity-sector competition and could target these efforts to achieve social policy goals.

The Article explores evolving approaches to markets and competition, but it does not take a position on the relative merits of competitive or traditionally regulated electricity sectors. Both have value, particularly during a period of rapid technological developments.[13] Some innovations are more likely to emerge in competitive markets where grid operators may be agnostic between the choice of purchasing additional electricity versus using other means to satisfy electricity demand.[14] Traditionally regulated states may facilitate other

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more fundamental rethinking of competition and social policy. The result is a blending of market-based and cost-of-service approaches as policymakers seek the proper balance of social policy goals and market reliance.

12. *See* FRANCISCO FLORES-ESPINIO ET AL., NAT'L RENEWABLE ENERGY LAB., COMPETITIVE ELECTRICITY MARKET REGULATION IN THE UNITED STATES: A PRIMER 9–10 (Dec. 2016), https://www.nrel.gov/docs/fy17osti/67106.pdf [https://perma.cc/F94L-3W88].

13. William Boyd & Ann E. Carlson, *Accidents of Federalism: Ratemaking and Policy Innovation in Public Utility Law*, 63 UCLA L. REV. 810, 835–78 (2016) (discussing rate-setting innovations in competitive and traditionally regulated systems).

14. *See* Michael Wara, *Fostering Competition in the 21st Century Electricity Industry*, 40 HARV. ENVTL. L. REV. F. 41, 47–48 (2016).

innovations, such as implementing new approaches to rate setting and incentivizing investment in next-generation energy technologies.[15]

Part I provides a brief history of electricity-sector competition to provide context for the discussions of restructured and traditionally regulated electricity sectors that follow. Parts II and III explore the different relationships to competition in traditionally regulated and restructured markets.[16] Proponents of restructuring argued that it would increase natural gas generation and remove barriers to energy efficiency and renewable energy.[17] These rapid changes are leading some restructured states to implement their own market-correction efforts, such as "zero emission credits" (ZECs), and leading the Department of Energy to propose subsidies for coal and nuclear power plants.[18] Part III contrasts these responses with efforts in traditionally regulated territories to expand opportunities for electricity competition: North Carolina's new competitive procurement process for solar energy, a Nevada law allowing energy users to exit the monopoly's exclusive service territory, and a recent Nevada ballot measure calling for the state to restructure its electricity sector.

Part IV identifies four crucial lessons for realizing social and environmental benefits in both competitive electricity markets and the territories of traditionally regulated monopolies. First, core societal values continue to drive electricity-sector policy and will have direct impacts on the evolution of the sector. Second, case-by-case efforts to support specific, existing

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15. *See, e.g.*, David A. Repka & Tyson R. Smith, *Deep Decarbonization and Nuclear Energy*, 48 ENVTL. L. REP. 10244, 10257 (2018) (discussing the role of cost recovery in incentivizing new nuclear construction).

16. Restructured states rely on regional transmission organizations (RTOs) to design and operate wholesale electricity markets to achieve the core energy values. The market rules benefit some market participants more than others (e.g., capacity auctions excluding intermittent resources such as solar energy). Some restructured states have been generally agnostic regarding electricity generation options, while others impose additional market-based measures on RTO markets (e.g., carbon markets, renewable portfolio standards, energy efficiency programs). This latter category of restructured states treats competition as the means to achieve numerous societal goals that extend beyond affordability and reliability.

17. *See, e.g.,* Richard J. Pierce, Jr., *A Proposal to Deregulate the Market for Bulk Power*, 72 VA. L. REV. 1183 (1986).

18. *See* Ray Gifford & Matt Larson, *The DOE NOPR: An Inevitable Next Step in Power "Market" Regulation*, UTIL. DIVE (Oct. 6, 2017), https://www.utilitydive.com/news/the-doe-nopr-an-inevitable-next-step-in-power-market-regulation/506703/ [https://perma.cc/468U-C4VS]; Plumer, *supra* note 6.

facilities are resulting in a post hoc cost-of-service approach without direct oversight of system needs and rates. Third, ZEC programs and the Trump administration's proposed subsidies are reactions to electricity prices falling below the level necessary to deliver social benefits. Without proactive measures to help communities weather economic impacts and ensure that states achieve environmental goals, reactive, case-by-case responses will likely continue. Finally, policymakers in traditionally regulated states may harness market forces to deliver new benefits to ratepayers without rejecting the monopoly utility model.[19]

I. A BRIEF HISTORY OF ELECTRICITY-SECTOR COMPETITION

State oversight of the electricity sector once depended largely on monopoly utilities to provide affordable, reliable power.[20] Public utilities accepted the obligation to provide affordable and reliable electricity at rates determined by state public utilities commissions (PUCs). In exchange, state law prohibited other entities from selling electricity to retail customers within the utilities' respective service territories.[21]

PUCs replaced market competition with rates based on the utility's costs of providing reliable electricity.[22] This approach, referred to as cost-of-service rate setting, sought to compensate utilities for capital investments and ensure the financial viability of the firm, including allowing a reasonable rate of return

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19. This creates a new opportunity to realize the early vision of the public utility as an undertaking to "harness[ ] the power of private enterprise and direct[ ] it toward public ends." William Boyd, *Public Utility and the Low-Carbon Future*, 61 UCLA L. REV. 1614, 1619–20 (2014).

20. W. KIP VISCUSI ET AL., ECONOMICS OF REGULATION AND ANTITRUST 325–26 (2d ed. 1995). Allowing electric utilities, water utilities, and telecommunication companies to operate as monopolies took advantage of economies of scale, scope, and coordination. STEVE ISSER, ELECTRICITY RESTRUCTURING IN THE UNITED STATES: MARKETS AND POLICY FROM THE 1978 ENERGY ACT TO THE PRESENT 12–13 (2015) (discussing the distinction between the terms *deregulation* and *restructuring* in the context of electricity regulation). The adoption of the monopoly structure and state-imposed exclusive service territory was not intended to squash innovation. Boyd, *supra* note 19, at 1647 ("The broad concept of public utility advanced by progressives and legal realists thus embodied a pragmatic approach to competition and markets in an era of rapid industrial change . . . .").

21. Joseph P. Tomain, *Electricity Restructuring: A Case Study in Government Regulation*, 33 TULSA L.J. 827, 832 (1998).

22. *Id.*

on capital investments to attract investors.[23] Rate setting removed financial risk for the electricity provider, allowing utilities to access the capital and equity necessary for expensive infrastructure investments.[24] State law granted public utilities exclusive service territories—specific geographic areas in which the respective public utility would be the exclusive provider of electricity.[25]

Providing a rate of return for capital investments naturally incentivizes the private firm to pursue high-cost infrastructure projects.[26] PUCs control for this incentive by relying on the "least cost mandate" approach—with the default assumption that a prudent investment by a regulated monopoly is the lowest-cost option that meets demand, complies with applicable laws, and satisfies other relevant criteria.[27]

The cost-of-service rate-setting model has been the subject of multiple criticisms over the years, including: regulatory capture;[28] information asymmetries between utilities and utility commissions resulting in approval of unnecessary, or unnecessarily expensive, capital projects;[29] and inherent incentives for utilities to maximize capital expenditures in order to increase shareholder returns.[30] These criticisms were amplified in the

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23. Boyd & Carlson, *supra* note 13, at 827.

24. *See, e.g.*, Boyd, *supra* note 19, at 1643–44. "The planning, sequencing, and financing of hundreds of billions of dollars in new investments needed to modernize the electric power grid and build new low carbon generation will require a level of certainty regarding cost recovery that markets alone will have difficulty providing." *Id.* at 1618.

25. *Id.* at 1643.

26. Harvey Averch & Leland L. Johnson, *Behavior of the Firm Under Regulatory Constraint*, 52 AM. ECON. REV. 1052, 1068 (1962).

27. Jonas J. Monast, *Maximizing Utility in Electric Utility Regulation*, 43 FLA. ST. U. L. REV. 135, 146–49 (2015).

28. Boyd, *supra* note 19, at 1652 (citing George J. Stigler, *The Theory of Economic Regulation*, 2 BELL J. ECON. & MGMT. SCI. 3, 3 (1971)).

29. Paul L. Joskow, *Incentive Regulation in Theory and Practice: Electricity Distribution and Transmission Networks*, *in* ECONOMIC REGULATION AND ITS REFORM: WHAT HAVE WE LEARNED? 291 (2014), http://www.nber.org/chapters/c12566.pdf [https://perma.cc/Z4NP-EAEC]; Adam R. Fremeth & Guy L.F. Holburn, *Information Asymmetries and Regulatory Decision Costs: An Analysis of U.S. Electric Utility Rate Changes 1980-2000*, 28 J.L. ECON. & ORG. 127 (2012); John S. Moot, *Economic Theories of Regulation and Electricity Restructuring*, 25 ENERGY L.J. 273, 287 (2004) (noting that cost-of-service ratemaking was blamed for exacerbating nuclear cost overruns because facilities were not cancelled early); David B. Spence, *Can Law Manage Competitive Energy Markets?*, 93 CORNELL L. REV. 765, 771 (2008).

30. JIM LAZAR & REGULATORY ASSISTANCE PROJECT STAFF, ELECTRICITY REGULATION IN THE US: A GUIDE 86–87 (2d ed. 2016), http://www.raponline.org/

late 1970s and 1980s as the combination of high inflation, decreased demand for electricity, and the Three Mile Island accident resulted in cancelled nuclear projects.[31]

Many of the critics of vertically integrated electric utilities argued that competitive markets would result in lower prices and better services, enhance innovation, and better achieve environmental goals.[32] The criticisms were not uniform, however.[33] Over half of the states continued to view the vertically integrated electric utility as the best option for meeting electricity-sector goals, but a growing chorus of stakeholders and policymakers viewed competition as necessary to induce cost discipline on utility executives.[34]

The 1978 Public Utilities Regulatory Policy Act (PURPA) was an initial step toward utilizing competition to transform the electricity sector in socially beneficial ways.[35] The law required local utilities to purchase power from qualifying facili-

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wp-content/uploads/2016/07/rap-lazar-electricity-regulation-US-june-2016.pdf [https://perma.cc/D9SK-RU6Y] (noting that traditional monopoly utility regulation may incentivize higher operating expenses because understaffed PUCs often approve higher operating expenses that can increase the revenues that utilities are allowed to earn in future years); Joseph P. Tomain, *The Past and Future of Electricity Regulation*, 32 ENVTL. L. 435, 448 (2002).

31. *See* Pierce, *supra* note 17, at 1183–86; *see also* Douglas Martin, *3 Mile Island: Financial Fallout*, N.Y. TIMES, Jan. 13, 1981, at D1, https://www.nytimes.com/1981/01/13/business/3-mile-island-financial-fallout.html [https://perma.cc/AU72-BJ85].

32. *See, e.g.*, Pierce, *supra* note 17, at 1192 ("These inefficiencies fall into seven basic categories: (1) incomplete realization of economies of scale and coordination; (2) distortion of investment decisions by Averch-Johnson and negative Averch-Johnson effects; (3) opportunistic behavior by regulators; (4) intertemporal distortion of rates and investment decisions caused by embedded cost ratemaking; (5) inefficiencies created by retail rate structures not based on marginal cost principles; (6) distorted purchase and use incentives created by wholesale rate structures not based on marginal cost principles; and (7) distortions created by opportunities to purchase bulk power from loosely regulated corporate affiliates.").

33. Douglas Gagax & Kenneth Nowotny, *Competition and the Electric Utility Industry: An Evaluation*, 10 YALE J. ON REG. 63, 72–76 (1993) (noting the continued cost benefits of centralized electricity generation).

34. Spence, *supra* note 29, at 774–75; U.S. ENERGY INFO. ADMIN., STATUS OF STATE ELECTRIC INDUSTRY RESTRUCTURING ACTIVITY AS OF FEBRUARY 2003 (Feb. 2003), https://www.eia.gov/electricity/policies/legislation/california/pdf/restructure.pdf [https://perma.cc/JL94-TKDW].

35. *See* Public Utilities Regulatory Policy Act, 16 U.S.C. § 2601 (2012); *see also* Chris Warren, *Once an Obscure Law, PURPA Now Drives Utility-Scale Solar. Regulatory Conflict Quickly Followed*, GREENTECH MEDIA (Feb. 23, 2017), https://www.greentechmedia.com/articles/read/purpa-is-causing-conflict-in-montana [https://perma.cc/9CDR-75DZ].

ties at the utility's "avoided cost," thus reducing barriers to electricity generation from renewable energy and combined-heat-and-power sources.[36] In doing so, PURPA required utilities and PUC commissioners to treat electricity generation and delivery as separate services with different prices.[37] Together, these steps "demonstrated the viability of competitive entry into the capital-intensive power generation business."[38] Subsequent steps to unbundle transmission and generation services include FERC Order 888, which requires open access to interstate transmission lines and lays out initial requirements for independent system operators (ISOs), and FERC Order 2000, which establishes requirements for regional transmission organizations.[39]

Some states opted to move away from cost-of-service regulation in the 1990s and 2000s following FERC's efforts to facilitate market-based competition.[40] These states required their state-regulated monopoly utilities to divest themselves of generation and transmission assets.[41] In these states, monopolies still operate electricity grids to deliver power to retail customers (i.e., end users of electricity).[42] Some of these states al-

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36. 16 U.S.C. § 824a-3(a)–(b); Moot, *supra* note 29, at 274.

37. PURPA, Pub. L. No. 95-617, 92 Stat. 3117 (Nov. 9, 1978); Spence, *supra* note 29, at 772–74.

38. Matthew W. White, *Power Struggles: Explaining Deregulatory Reforms in Electricity Markets*, BROOKINGS PAPERS: MICROECONOMICS 201, 207 (1996), https://www.brookings.edu/wp-content/uploads/1996/01/1996_bpeamicro_white.pdf [https://perma.cc/YWX3-WL6Z].

39. Regional Transmission Organizations, Order No. 2000, 65 Fed. Reg. 810 (Jan. 6, 2000); Jim Rossi, *The Common Law "Duty to Serve" and Protection of Consumers in an Age of Competitive Retail Public Utility Restructuring*, 51 VAND. L. REV. 1233, 1280 (1998) ("[T]he most significant event to date in electricity industry restructuring is a rulemaking FERC adopted in 1996, known as the electricity mega-Grid Resiliency NOPR or Order No. 888. Order No. 888 is designed to restructure wholesale markets for electricity, in a manner similar to FERC's competitive restructuring of the natural gas industry which FERC achieved in 1992 by adopting Order No. 636.").

40. Ari Peskoe, *Easing Jurisdictional Tensions by Integrating Public Policy in Wholesale Electricity Markets*, 38 ENERGY L.J. 1, 3–4 (2017); Boyd, *supra* note 19, at 1628–29. Numerous states were at various stages of considering restructuring but put those efforts on hold in the aftermath of the California electricity crisis. Spence, *supra* note 29, at 774–75 ("[The] California energy crisis of 2000–2001 cowed some states into halting their restructuring plans, though retail competition continued in sixteen states and the District of Columbia.").

41. *See* Spence, *supra* note 29, at 784 n.104; ISSER, *supra* note 20, at 1 (discussing the distinction between the terms *deregulation* and *restructuring* in the context of electricity regulation).

42. Rossi, *supra* note 39, at 1283.

low consumers to choose their electricity provider, while others rely on the operator of local grids to purchase and deliver electricity.[43] PUCs continue to oversee rates charged for the operation of these distribution systems and, in instances where distribution companies are purchasing power on behalf of their consumers, the prices distribution companies pay for electricity.[44] These restructured states depend on regional transmission organizations (RTOs) or independent system operators (ISOs) to operate wholesale electricity markets and the transmission systems.[45]

The details of restructuring vary by state. When this Article refers to competitive markets, it is primarily referencing experiences in three RTO/ISO markets—PJM, New York ISO (NYISO), and New England (ISO-NE)—for four reasons.[46] The first is size. Together, these RTO territories serve a population of almost one hundred million.[47] The second is FERC jurisdiction, which makes federal oversight of wholesale electricity markets a key factor.[48] (The Texas electricity system (ERCOT) presents some of the same issues, but because the system is entirely within the state borders, FERC does not have jurisdiction.[49]) The third is the fact that these markets include restructured states. The NYISO is fully restructured, as is ISO-NE,

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43. David B. Spence, *Coal-Fired Power in a Restructured Electricity Market*, 15 DUKE ENVTL. L. & POL'Y F. 187, 202 (2005).

44. Jonas J. Monast & Sarah K. Adair, *Completing the Energy Innovation Cycle: The View from the Public Utility Commission*, 65 HASTINGS L.J. 1345, 1378–81 (2014) (discussing Rhode Island PUC oversight of a contract to purchase electricity from an offshore wind facility).

45. Boyd & Carlson, *supra* note 13, at 837.

46. Other RTOs, such as the Midcontinent ISO (MISO) and the Southwest Power Pool (SPP) strike a middle ground, with electricity generators competing in energy markets but PUCs still providing cost recovery for capital investments and therefore addressing capacity needs.

47. *See* PJM, PJM LOAD FORECAST REPORT 9 (2018), https://www.pjm.com/-/media/library/reports-notices/load-forecast/2018-load-forecast-report.ashx?la=en [https://perma.cc/8DPF-VFEJ]; *Key Grid and Market Stats*, ISO-NEW ENGLAND, https://www.iso-ne.com/about/key-stats/ (last visited Oct. 8, 2018) [https://perma.cc/PUK5-KU3J]; TARIQ NIAZI, N.Y. INDEP. SYS. OPERATOR, INTRODUCTION TO THE NYISO & NY'S WHOLESALE ELECTRICITY MARKETS 5 (May 25, 2016), https://www.nyserda.ny.gov/-/media/Files/EDPPP/LIFE/Conferences/ [https://perma.cc/WH2E-Q73D].

48. *See* Clinton Vince et al., *What Is Happening and Where in the World of RTOs and ISOs?*, 27 ENERGY L.J. 65, 76–80 (2006).

49. David B. Spence, *Introduction to ERCOT's Jurisdictional Status,* 3 TEX. J. OIL GAS & ENERGY L. 1, 1 (2008).

with the exception of Vermont.[50] PJM is a hybrid market that includes some restructured states and some that require electric utilities to transfer control of transmission assets to the RTO and participate in competitive energy markets, but PUCs continue their historic rate-setting role.[51] The final reason is that each of these markets include nuclear power plants that have recently become uneconomic due to low natural gas prices.[52]

RTO market design choices are not agnostic. The manner in which RTOs price various attributes (e.g., location and ability to dispatch when needed) influences the relative competitiveness among energy resources.[53] Reliability rules dictate certain investments, and RTOs regularly adjust capacity auction rules to incentivize a sufficient number of generation owners to ensure that their facilities will be available to provide electricity at a future date.[54] Capacity markets, for example, may reward dispatchable generation options (i.e., power plants that can provide electricity when needed, in contrast to energy resources such as solar and wind), create barriers to renewable energy investments, and minimize the role of state energy policies.[55]

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50. *See Vermont Electric Utilities*, VT. DEPT. OF PUB. SERV., http://publicservice.vermont.gov/electric (last visited Oct. 7, 2018) [https://perma.cc/4R8M-24L94]; SUSAN F. TIERNEY, THE NEW YORK INDEPENDENT OPERATING SYSTEM: A TEN-YEAR REVIEW 2 (2010), https://www.analysisgroup.com/uploadedfiles/content/insights/publishing/tierney_nyiso_10_year_review.pdf [https://perma.cc/2YKW-94JQ].

51. *See* Erin T. Mansur, *Upstream Competition and Vertical Integration in Electricity Markets*, 50 J.L. & ECON. 125, 125–26 (2007).

52. *See* David Solimeno, Note, *Armageddon: The Inevitable Death of Nuclear Power and Whether New York State Has the Legal Authority to Keep It on Life Support*, 35 PACE ENVTL. L. REV. 135, 143–44 (2017).

53. Danny Cullenward & Shelley Welton, *The Quiet Undoing: How Regional Electricity Market Reforms Threaten State Clean Energy Goals*, 36 YALE J. ON REG. (2018–19), http://yalejreg.com/the-quiet-undoing-how-regional-electricity-market-reforms-threaten-state-clean-energy-goals/ [https://perma.cc/K43R-ELGV] (criticizing FERC efforts to undermine state renewable energy policies).

54. Capacity markets don't guarantee that the electricity will be purchased. Instead, they pay companies for being available if needed. Emily Hammond & David B. Spence, *The Regulatory Contract in the Marketplace*, 69 VAND. L. REV. 141, 153 (2016).

55. Cullenward & Welton, *supra* note 53; 163 FERC ¶ 61,236 (2018). "Resource offers (or bids into the market) that are deemed subsidized would be subject to an expanded Minimum Offer Price Rule (MOPR) with few or no exceptions, which would bump up these offers to a price deemed competitive." Jennifer Chen, *Understanding FERC's Order Rejecting PJM's Capacity Market Proposals and the Proposed Replacement Framework*, NICHOLAS INST.: DUKE U.

Other examples of utilizing competition to achieve social goals abound. Twenty-nine states have implemented renewable portfolio standards that create mandatory renewable energy targets, thus guaranteeing market demand for qualifying renewable energy generation.[56] State net metering policies create market incentives for homeowners and businesses to invest in rooftop solar generation.[57] Some RTOs and ISOs utilize capacity markets—essentially auctions for the promise that dispatchable electricity generation will be prepared to supply power at a later date—to address concerns that electricity market prices may not incentivize sufficient construction and maintenance investments necessary to ensure reliability.[58] State and federal policies utilize market-based environmental policies to create incentives to invest in pollution control technologies and/or lower-emitting resources.[59] RTOs, stakeholders, and scholars are considering strategies to implement carbon pricing pursuant to the existing authority in the Federal Power Act.[60] An emerging focus on transactive energy—a dynamic approach to electricity markets that can accommodate distributed resources and integrate smart grid technologies—demonstrates potential changes to platforms facilitating competition.[61]

(July 18, 2018), https://nicholasinstitute.duke.edu/articles/understanding-ferc%E2%80%99s-order-rejecting-pjm%E2%80%99s-capacity-market-proposals-and-proposed [https://perma.cc/993Y-49WE]; *see also* Jennifer Chen, *PJM's New Rules Skew Against Clean Energy; Silver Lining in a Lower Forecast*, NRDC: EXPERT BLOG (May 24, 2016), https://www.nrdc.org/experts/jennifer-chen/pjms-new-rules-skew-against-clean-energy-silver-lining-lower-forecast [https://perma.cc/NW86-7BHZ].

56. *State Renewable Portfolio Standards and Goals*, NAT'L CONF. STATE LEGISLATURES (July 20, 2018), http://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx [https://perma.cc/5DWG-VDRP].

57. *See* Julia Pyper, *More Than Half of U.S. States Are Studying or Changing Net Metering Policies*, GREENTECH MEDIA (Nov. 13, 2015), https://www.greentechmedia.com/articles/read/more-than-half-of-us-states-are-studying-or-changing-net-metering-policies [https://perma.cc/86AV-B72D].

58. Joel B. Eisen, *FERC's Expansive Authority to Transform the Electric Grid*, 49 U.C. DAVIS L. REV. 1783, 1824 (2016).

59. Jonas Monast, *From Top-Down to Bottom-Up Climate Policy: New Challenges in Carbon Market Design*, 8 SAN DIEGO J. CLIMATE & ENERGY L. 175, 180, 185 (2017).

60. Peskoe, *supra* note 40, at 15–16.

61. *Transactive Energy: An Overview*, NAT'L INST. OF STANDARDS & TECH. (Apr. 19, 2017), https://www.nist.gov/engineering-laboratory/smart-grid/transactive-energy-overview [https://perma.cc/KL2L-3HYK]; *see also* Joel B. Eisen & Felix Mormann, *Free Trade in Electric Power*, 2018 UTAH L. REV. 49, 53–54, 57–77 (2018).

These market interventions are important elements of the complex policy ecosystem that will influence the future makeup of the U.S. electricity grid, but a detailed analysis of the respective efforts is beyond the scope of this article. Instead, this analysis focuses on recent shifts in views of competition that are seemingly at odds with a state's chosen approach—competitive markets or monopoly utilities—to identify lessons for the role of competition in achieving social goals.

II. RETHINKING COMPETITION IN RESTRUCTURED STATES

Competitive electricity markets have been far more disruptive to the power sector than the proponents of restructuring could have foreseen.[62] Natural gas prices are hovering at historic lows.[63] Electricity-demand growth is generally flat and may soon decline.[64] Prices for wind and solar energy have fallen significantly and both are playing a growing role in electricity generation.[65] In some states, wind energy is able to com-

62. *See, e.g.*, U.S. ENERGY INFO. ADMIN., DOE/EIA-0383, ANNUAL ENERGY OUTLOOK 2006 WITH PROJECTIONS TO 2030 (Feb. 2006), https://www.eia.gov/outlooks/archive/aeo06/electricity.html [https://perma.cc/7FVW-NBU8] (projecting that "[c]oal-fired and natural-gas-fired plants account for about 50 percent and 40 percent, respectively, of the capacity additions from 2004 to 2030"). As further evidence of the rapidly changing market dynamics, the 2006 Annual Energy Outlook states that "[c]oal-fired capacity is generally more economical to operate than natural-gas-fired capacity, because coal prices are considerably lower than natural gas prices. As a result, new natural-gas-fired plants are built to ensure reliability and operate for comparatively few hours when electricity demand is high." *Id.*

63. *Future U.S. Electricity Generation Will Depend Largely on Natural Gas Prices*, U.S. ENERGY INFO. ADMIN. (Feb. 7, 2018), https://www.eia.gov/todayinenergy/detail.php?id=34852 [https://perma.cc/5WSX-JX96] [hereinafter *Future U.S. Electricity Generation*]. Note, however, that natural gas prices exhibit seasonal fluctuations, with higher prices in winter months due to increased demand for heat. *Natural Gas Prices Reflect Decreasing Seasonality*, U.S. ENERGY INFO. ADMIN. (Nov. 20, 2013), https://www.eia.gov/todayinenergy/detail.php?id=13871 [https://perma.cc/QQ9B-YBVJ].

64. *U.S. Economy and Electricity Demand Growth Are Linked, but Relationship Is Changing*, U.S. ENERGY INFO. ADMIN. (Mar. 22, 2013), https://www.eia.gov/todayinenergy/detail.php?id=10491 [https://perma.cc/AFN3-PFTD].

65. *See* Jairo Chung & Jim Hempstead, *Utilities Increasingly Adding Low Cost Wind Power to Rate Base, Leaving Inefficient Coal Plants at Risk*, MOODY'S INV. SERV. (Mar. 15, 2017), https://www.moodys.com/research/Moodys-Utilities-increasingly-adding-low-cost-wind-power-to-rate--PR_363547 [https://perma.cc/SB54-RPR3]; Michael O'Boyle, *Wind and Solar Are Our Cheapest Electricity Generation Sources. Now What Do We Do?*, GREENTECH MEDIA (Jan. 26, 2017), https://www.greentechmedia.com/articles/read/wind-and-solar-are-our-cheapest-electricity-generation-sources-now-what-do#gs.KyyugMY [https://perma.cc/T8HW-

pete on a cost basis with coal.[66] Coal-fired power plants provided approximately half of the nation's electricity generation between 1995 and 2005, but that number dropped to 30 percent by 2015, and additional retirements are expected to continue at least through the near future.[67] "War on coal" rhetoric that was common during most of the Obama presidency suggested that these impacts were due to deliberate policy choices, but it was

MGKK] (explaining that while solar and wind pricing have decreased dramatically since 2009, certain states have seen more of a decrease than others); Earl J. Ritchie, *The Cost of Wind and Solar Intermittency*, FORBES (Jan. 24, 2017), https://www.forbes.com/sites/uhenergy/2017/01/24/the-cost-of-wind-and-solar-intermittency [https://perma.cc/MF7J-228B].

66. Ritchie, *supra* note 65.

67. MJ BRADLEY & ASSOC., COAL-FIRED ELECTRICITY GENERATION IN THE UNITED STATES AND FUTURE OUTLOOK 2 fig.1 (Aug. 28, 2017), http://www.mjbradley.com/sites/default/files/MJBAcoalretirementissuebrief.pdf [https://perma.cc/YN8Y-QA55]. Coal-fired power plants

> [A]ccounted for 51 percent of total U.S. electricity generation on average from 1949 through 2005. However, since that time, coal's share of generation has declined at a steady clip [ ]. In 2016, U.S. coal plants accounted for just 30 percent of total generation output, according to government figures—2016 was a year of record low natural gas prices in the U.S. contributing to the decline in coal generation. For the first time, in 2016, natural gas was the leading source of electricity generation (34 percent of total generation), reflecting an on-going trend that is reshaping the nation's generation mix.

Id. at 1. Coal retirements between 2010 and 2015 were caused by a combination of low natural gas prices and the EPA's 2011 rule limiting mercury emissions. *Coal Made Up More Than 80% of Retired Electricity Generating Capacity in 2015*, U.S. ENERGY INFO. ADMIN. (Mar. 6, 2016), https://www.eia.gov/todayinenergy/detail.php?id=25272 [https://perma.cc/6HRD-QHQN]; FED. ENERGY REG. COMM'N, OFFICE OF ENERGY PROJECTS ENERGY INFRASTRUCTURE UPDATE (2017), https://www.ferc.gov/legal/staff-reports/2017/nov-energy-infrastructure.pdf [https://perma.cc/ZBZ9-8NNM] (projecting retirement of an additional 20 gigawatts (GW) of coal-fired capacity by 2020, compared to 92 GW of new natural gas-fired capacity, 72 GW of new wind capacity, and 43.5 GW of new solar capacity in the same timeframe). Reduced demand for coal-fired power is a consistent trend over the past decade. *Power Sector Coal Demand Has Fallen in Nearly Every State Since 2007*, U.S. ENERGY INFO. ADMIN. (Apr. 28, 2016), http://wnew.www.eia.gov/todayinenergy/detail.php?id=26012 [https://perma.cc/F4AB-WLHW]. Additional coal retirements were announced as this Article was in the editing process. Rye Druzin, *Texas Coal Plant to Shut Down by 2020*, HOUS. CHRONICLE (Sept. 25, 2018, 11:28 AM), https://www.chron.com/business/energy/article/Texas-coal-plant-to-shut-down-by-2020-13255710.php [https://perma.cc/3LX3-7N8J]; Robert Walton, *FirstEnergy to Retire More Than 4 GW of PJM Coal Plant Capacity*, UTIL. DIVE (Aug. 30, 2018), https://www.utilitydive.com/news/firstenergy-to-retire-more-than-4-gw-of-pjm-coal-plant-capacity/531300/ [https://perma.cc/F9WH-865H].

primarily market and technological changes that undercut coal's dominance in the electricity sector.[68]

Existing nuclear power plants in competitive markets also struggled with the quick change in market prices.[69] The Kewaunee Power Station in Wisconsin and the Vermont Yankee Nuclear Power Station in Vermont were the first nuclear units to cite low natural gas prices as a primary factor in decisions to retire nuclear power plants.[70] Six additional nuclear plants are scheduled to retire by 2026, and Exelon has indicated that it will retire the Three Mile Island facility in Pennsylvania unless it receives support to make the plant financially viable.[71] Even nuclear power plants that remain economically viable are facing the expiration of their federal operating permits within a

68. *See* Sam Kalen, *Coal's Plateau and Energy Horizon?*, 34 PUB. LAND & RES. L. REV. 145, 147–48 (2013).

69. *See* STEVE CLEMMER ET AL., THE NUCLEAR POWER DILEMMA: DECLINING PROFITS, PLANT CLOSURES, AND THE THREAT OF RISING CARBON EMISSIONS 1 (Nov. 2018), https://www.ucsusa.org/sites/default/files/attach/2018/11/Nuclear-Power-Dilemma-full-report.pdf [https://perma.cc/X6JX-6W7H] (citing "the economic challenges brought on by cheap natural gas, diminished demand for electricity, falling costs for renewable energy, rising operating costs, and safety and performance problems" as the primary factors causing early retirement of nuclear power plants in the United States); EDWARD KEE, NUCLEAR ECON. CONSULTING GROUP, THE FUTURE OF U.S. NUCLEAR POWER 2–3, 13 (2017), https://www.eia.gov/conference/2017/pdf/presentations/edward_kee.pdf [https://perma.cc/HN88-RT96] (attributing in part the inability of some nuclear power plants to remain open in a competitive market to a failure of the market).

70. *Vermont Yankee Nuclear Plant Closure in 2014 Will Challenge New England Energy Markets*, U.S. ENERGY INFO. ADMIN. (Sept. 6, 2013), https://www.eia.gov/todayinenergy/detail.php?id=12851 [https://perma.cc/9UVC-QJ7G] (citing low electricity prices, low capacity market prices, and high operating costs as factors leading to the retirement of Vermont Yankee); Matthew L. Wald, *As Price of Nuclear Energy Drops, a Wisconsin Plant Is Shut*, N.Y. TIMES (May 7, 2013), http://www.nytimes.com/2013/05/08/business/energy-environment/kewaunee-nuclear-power-plant-shuts-down.html [https://perma.cc/43G2-BSDV]. Two additional nuclear plants retired in 2013 due to maintenance issues. Matthew L. Wald, *Nuclear Plants, Old and Uncompetitive, Are Closing Earlier Than Expected*, N.Y. TIMES (June 14, 2013), http://www.nytimes.com/2013/06/15/business/energy-environment/aging-nuclear-plants-are-closing-but-for-economic-reasons.html [https://perma.cc/A4BZ-BFHQ].

71. *Three Mile Island Is the Latest Nuclear Power Plant to Announce Retirement Plans*, U.S. ENERGY INFO. ADMIN. (June 13, 2017), https://www.eia.gov/todayinenergy/detail.php?id=31612 [https://perma.cc/3QNC-UM86] ("In the announcement of its plan to retire Three Mile Island, Exelon noted that the plant had not been profitable for the past five years, and they sought subsidies from Pennsylvania to provide the financial support necessary to keep the plant open.").

decade and thus must soon determine whether to undertake the investments required to secure a license extension.[72]

Of all of the changes facing the sector, the rapid decline of natural gas prices is the most important driver of the dramatic transition underway in the electricity sector.[73] Prior to the shale gas revolution, natural-gas-fired turbines were inexpensive to construct but costly to operate due to the high cost of natural gas compared to other fuels relied upon for electricity generation.[74] As a result, natural-gas-fired generation was generally limited to providing power during periods of higher electricity demand—peak load.[75] Efficient extraction of shale gas quickly changed the equation.

According to the Department of Energy:

> The increased use of natural gas in the electric sector has resulted in sustained low wholesale market prices that reduce the profitability of other generation resources important to the grid. The fact that new, high-efficiency natural gas plants can be built relatively quickly, compared to coal and nuclear power, also helped to grow gas-fired generation. Production costs of coal and nuclear plants remained somewhat flat, while the new and existing, more flexible, and relatively lower-operating cost natural gas plants drove down wholesale market prices to the point that some formerly profitable nuclear and coal facilities began operating at a loss.[76]

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72. *See* Krysti Shallenberger, *FPL's Turkey Point Becomes First Nuclear Plant to Seek Second License Renewal*, UTIL. DIVE (Feb. 6, 2018), https://www.utilitydive.com/news/fpls-turkey-point-becomes-first-nuclear-plant-to-seek-second-license-renew/516441 [https://perma.cc/Q5CA-RDQ8].

73. Natural gas prices have historically been volatile. Projections of sustained low prices, rather than short-term drops in prices, are the critical factor here. *Future U.S. Electricity Generation*, *supra* note 63.

74. *See* Tyler Hodge, *EIA Forecasts Natural Gas to Remain Primary Energy Source for Electricity Generation*, U.S. ENERGY INFO. ADMIN. (Jan. 22, 2018), https://www.eia.gov/todayinenergy/detail.php?id=34612 [https://perma.cc/BM54-3K33].

75. *See Average Utilization of the Nation's Natural Gas Combined-Cycle Power Plant Fleet Is Rising*, U.S. ENERGY INFO ADMIN. (June 9, 2011), https://www.eia.gov/todayinenergy/detail.php?id=1730 [https://perma.cc/3G2Q-Q796] [hereinafter *Average Utilization of the Nation's Natural Gas*].

76. U.S. DEP'T OF ENERGY, STAFF REPORT TO THE SECRETARY ON ELECTRICITY MARKETS AND RELIABILITY 13 (2017), https://www.energy.gov/sites/prod/files/2017

While the impacts of shale gas extraction were largely unanticipated during initial state debates over restructuring, it is no accident that natural gas is playing a larger role in the electricity sector.[77] Increasing natural gas generation was a key goal of the Energy Policy Act of 1992 and of electricity restructuring, and these federal and state measures expanding opportunities for competition opened the door for shale gas to eventually play a transformative role.[78]

State and federal responses to these changing market conditions focus on delaying retirements of certain facilities by implementing new payments for particular attributes. A growing number of states with restructured electricity sectors are responding to the threat of early retirement of nuclear power plants by implementing new requirements that distribution companies (monopolies operating local electricity grids) purchase ZECs from nuclear power plants that are unable to outcompete other generation sources in competitive wholesale markets.[79] These programs seek to achieve state environmental policy goals as well as protect jobs at the existing facili-

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/08/f36/Staff%20Report%20on%20Electricity%20Markets%20and%20Reliability_0.pdf [https://perma.cc/EA7P-C3DE].

77. Peter Navarro, *A Guidebook and Research Agenda for Restructuring the Electricity Industry*, 16 ENERGY L.J. 347, 353 (1995) ("New and improved low-cost, high heat rate, combined cycle natural gas plants are now competitive with traditional large central station plants—at least at today's natural gas prices. While we shall question in far more detail below whether these natural gas plants truly spell the death of natural monopoly in the generation market, the current conventional wisdom is that they do. This claim is a primary basis for the overall restructuring efforts.").

78. *See, e.g.,* Sean Casten, *No Longer Cheap—So What Next?*, 53 FORT. SPARK 1 (2008) (noting that FERC-facilitated market liberalization helped incentivize independent power producers to invest in natural gas-fired generation). The anticipated role of new natural gas generation was primarily to provide power during periods of peak electricity demand rather than direct competition with the coal and nuclear power plants that historically provided baseload power—generation that consistently runs to provide power at all times during the day. *See Average Utilization of the Nation's Natural Gas, supra* note 75 ("[T]he low cost of coal relative to natural gas until recent years favored the use of coal-fired generating units to fulfill baseload electricity demand, leading plant operators to run these units at rates close to their output capacity during peak demand hours. During off-peak hours, such as overnight, coal plants generally continued to operate.").

79. DANIEL SHEA & KRISTY HARTMAN, NAT'L CONF. STATE LEGISLATURES, STATE OPTIONS TO KEEP NUCLEAR IN THE ENERGY MIX 25 (Jan. 2017), http://www.ncsl.org/Portals/1/Documents/energy/StateOptions_NuclearPower_f02_WEB.pdf [https://perma.cc/A4PL-72U4].

ties.[80] At least one state—Ohio—has also considered implementing new subsidies for supporting coal-fired power plants.[81] The Trump administration justifies its proposed payments to nuclear power plants and coal-fired power plants under the guise of compensation for their unique reliability and resiliency attributes.[82]

State ZEC programs and the Trump administration's proposals are motivated by very different concerns and based on very different degrees of data and analysis. The New York Public Service Commission (New York PSC), for example, implemented ZECs as part of a comprehensive effort to redesign the state's electricity sector.[83] The Commission determined that it would be impossible to achieve New York's climate policy goals if three in-state nuclear power plants retired early because carbon-emitting natural-gas-fired power plants would likely replace the carbon-free generation from the nuclear facilities.[84]

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80. *See* S.B. 2814, 99th Gen. Assemb. (Ill. 2016) (citing the purpose of the zero emission credit program).

81. Peter Maloney, *Feud of the Year: Nuclear and Coal Vs. Competitive Markets*, UTIL. DIVE (Dec. 4, 2017), https://www.utilitydive.com/news/feud-of-the-year-nuclear-and-coal-vs-competitive-markets/508266/ [https://perma.cc/K2YS-SBJ9] ("Companion bills in Ohio, HB 239 and SB 155, would provide perpetual subsidies for two coal-fired plants: the 1,100 MW Kyger Creek in Cheshire and the 1,300 MW Clifty Creek in Madison, Indiana jointly owned by a group of utilities that includes American Electric Power, FirstEnergy and Duke Energy.").

82. Letter from Rick Perry, Sec'y, Dep't of Energy, to Neil Chatterjee et al., Fed. Energy Reg. Comm'n (Sept. 28, 2017), https://energy.gov/sites/prod/files/2017/09/f37/Secretary%20Rick%20Perry%27s%20Letter%20to%20the%20Federal%20Energy%20Regulatory%20Commission.pdf [https://perma.cc/QY7N-HX88]. For examples of the opposition to the Department of Energy proposal, see Gavin Bade, *'FERC Did Its Job:' Former Regulators, Lawyers Laud DOE NOPR Rejection*, UTIL. DIVE (Jan. 9, 2018), https://www.utilitydive.com/news/ferc-did-its-job-former-regulators-lawyers-laud-doe-nopr-rejection/514394/ [https://perma.cc/KB6U-GGCL]; Joshua S. Hill, *US Energy Industry Associations Urge FERC to Reject DOE Proposal to Subsidize Coal & Nuclear*, CLEANTECHNICA (Nov. 8, 2017), https://cleantechnica.com/2017/11/08/us-energy-industry-associations-urge-ferc-reject-doe-proposal-subsidise-coal-nuclear/ [https://perma.cc/5XTL-QRGM]; David Roberts, *Rick Perry's Plan to Subsidize Coal and Nuclear Plants Is Bonkers*, VOX (Oct. 4, 2017), https://www.vox.com/energy-and-environment/2017/10/4/16407278/rick-perry-doe-plan-coal-nuclear-energy-markets [https://perma.cc/HX2E-F4GP].

83. Order Adopting a Clean Energy Standard, Case No. 15-E-0302, at 3, 13–14 (N.Y. Pub. Serv. Comm'n Aug. 1, 2016), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7b44C5D5B8-14C3-4F32-8399-F5487D6D8FE8%7d [https://perma.cc/4RRK-TZZY] [hereinafter N.Y. Clean Energy Standard Order].

84. *Id.* at 19 ("Based on current market conditions, losing the carbon-free attributes of this generation before the development of new renewable resources between now and 2030, would undoubtedly result in significantly increased air

In contrast, the Trump administration has provided little defensible evidence that reliability concerns justify its proposals.[85] Reliability is a concern in some areas of the country, but one that system operators, market participants, and federal regulators generally agree is manageable as older coal and nuclear plants retire.[86] Furthermore, the Trump administration's narrow definitions of resiliency and ability to qualify for payments exclude other strategies for maintaining system reliability such as energy storage, expanded transmission systems, demand response, and other existing generation options.

While these market interventions are fundamentally different in many respects, they share similarities that are important for the future trajectory of the electricity sector. State ZEC programs and federal proposals to subsidize coal and nuclear plants each seek to rescue existing power plants that are no longer competitive due primarily to low natural gas prices.[87] Efforts to ensure the profitability of specific power plants effectively create a hybrid version of the rate-setting model that states rejected when they moved to break up the vertically integrated electric monopolies in the first place.

The following subsections describe ZECs and the Trump administration proposals in greater detail, identifying key elements of each strategy.

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emissions due to heavier reliance on existing fossil-fueled plants or the construction of new gas plants to replace the supplanted energy.").

85. *See, e.g.,* U.S. DEP'T OF ENERGY, *supra* note 76 (failing to find evidence that grid reliability required subsidizing economically vulnerable coal-fired power plants).

86. *See* Jared Anderson, *PJM Finds FirstEnergy Nuclear Plants Can Retire Without Threatening Reliability*, S&P GLOBAL PLATTS (Apr. 30, 2018), https://www.spglobal.com/platts/en/market-insights/latest-news/electric-power/043018-pjm-finds-firstenergy-nuclear-plants-can-retire-without-threatening-reliability [https://perma.cc/T5PQ-3AZ8]; Rachel Fakhry & Toba Pearlman, *Analysis: Illinois Does Not Need the Dynegy-Vistra Fleet*, NRDC (May 16, 2018), https://www.nrdc.org/experts/rachel-fakhry/analysis-illinois-does-not-need-dynegy-vistra-fleet [https://perma.cc/T8CB-RW2Z]. *See generally* MARK SPECHT & LAURA WISLAND, UNION OF CONCERNED SCIENTISTS, TURNING DOWN THE GAS IN CALIFORNIA, TECHNICAL APP. (Aug. 2018), https://www.ucsusa.org/sites/default/files/attach/2018/08/Turn-Down-Technical-Appendix.pdf [https://perma.cc/FF32-GYE2].

87. *See* Jennifer A. Dlouhy, *Trump Prepares Lifeline for Money-Losing Coal Plants,* BLOOMBERG (May 31, 2018), https://www.bloomberg.com/news/articles/2018-06-01/trump-said-to-grant-lifeline-to-money-losing-coal-power-plants-jhv94ghl [https://perma.cc/5MRT-YMPH]; *see also* Jessica Bayles, *New York's New Renewable Energy Standard*, NAT'L L. REV. (Sept. 27, 2016), https://www.natlawreview.com/article/new-york-s-new-renewable-energy-standard [https://perma.cc/5R3W-GMTE].

A. *State Efforts to Support Existing Nuclear Generation*

The New York PSC implemented the first ZEC program in 2016 as part of the state's Clean Energy Standard.[88] The program requires that load-serving entities (i.e., entities delivering electricity to retail consumers in the state) purchase ZECs from three nuclear power plants in the state.[89]

The Commission justified the ZEC requirements as the only alternative to realistically meet the state's greenhouse gas emission reduction targets. The New York PSC estimates a $4 billion benefit in the first two years of the ZEC program, compared to a cost of $1 billion.[90] According to the Commission, neither energy efficiency improvements nor increased renewable energy generation could replace the zero-carbon generation provided by the state's existing nuclear power plants.[91]

The state's climate goals are not the sole motivation behind the ZEC requirements, however. The Clean Energy Standard also cites "maintaining existing jobs" as another benefit of

88. N.Y. Clean Energy Standard Order, *supra* note 83, at 1. In addition to ZECs, the Clean Energy Standard established a renewable energy target of fifty percent by 2030. *Id.* at 76.

89. *REC and ZEC Purchasers*, N.Y. STATE ENERGY RES. & DEV. AUTH., https://www.nyserda.ny.gov/All-Programs/Programs/Clean-Energy-Standard/REC-and-ZEC-Purchasers (last visited Jan. 21, 2018) [https://perma.cc/7KE8-C26F]. The number of ZECs are capped at the historic generation of the state's FitzPatrick, Ginna, and Nine Mile Point nuclear facilities. N.Y. Clean Energy Standard Order, *supra* note 83, at 145.

90. Jeffrey Tomich & Saqib Rahim, *Exelon Girds for Challenges to Cuomo's N.Y. Nuclear Subsidy*, E&E NEWS (Aug. 19, 2016), https://www.eenews.net/stories/1060041817 [https://perma.cc/73Q6-7AF5] (citing figures from the July 8, 2016 New York PSC proposal).

91. N.Y. Clean Energy Standard Order, *supra* note 83, at 126–27 ("[I]t is simply unrealistic to assume that sufficient additional energy efficiency measures could be identified and implemented in time to offset the 27.6 million MWh of zero-emissions nuclear power that would need to be replaced per year . . . . As in the case of energy efficiency, it is not realistic to assume that sufficient additional renewable resources at a reasonable price or perhaps any price could be identified and implemented in sufficient time to offset the 27.6 million MWh of zero-emissions nuclear power per year.").

the new requirements.[92] According to a 2017 report, New York has 110,582 jobs in the energy efficiency sector.[93]

New York's ZEC program has not been without controversy. Opponents of the New York ZEC program brought suit, citing the U.S. Supreme Court's 2016 decision *Hughes v. Talen*, to argue that the New York approach was preempted by the Federal Power Act.[94] The *Hughes* Court considered a Maryland law that aimed to incentivize construction of a new natural-gas-fired power plant within the state.[95] The Court determined that the Federal Power Act preempted the state law because Maryland relied on a "contract for differences" approach to incentivize construction of the new facility.[96] Maryland committed to subsidizing the new power plant, but the prices paid to the new facility were tied directly to the PJM capacity market clearing prices.[97] The Supreme Court found that this direct link amounted to Maryland attempting to govern interstate, wholesale electricity transactions—a realm exclusively reserved for FERC.[98]

Rather than linking ZEC prices directly to NYISO market prices, the New York approach relies on the federal government's social cost of carbon for pricing the ZECs.[99] Illinois and Connecticut subsequently implemented their own versions of ZEC requirements.[100] New Jersey, Ohio, and Pennsylvania are considering following suit by implementing their own subsidy programs for existing nuclear units.[101]

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92. *Id.* at 7, 46–47. The ZEC requirements have been criticized due to the cost per protected job. One estimate puts the cost per job at $303,000, paid by New York's ratepayers. Michael Kuser, *NY Legislators Frustrated by Lack of Answers at ZEC Hearing*, RTO INSIDER (Mar. 7, 2017), https://www.rtoinsider.com/cuomo-administration-nuclear-plants-zecs-hearing-39787/ [https://perma.cc/EM7E-3RJS].

93. U.S. DEP'T OF ENERGY, 2017 U.S. ENERGY AND JOBS REPORT STATE CHARTS 194 (2017), https://energy.gov/sites/prod/files/2017/01/f34/2017%20US%20Energy%20and%20Jobs%20Report%20State%20Charts%202_0.pdf [https://perma.cc/EM7E-3RJS].

94. Coal. for Competitive Elec. v. Zibelman, 906 F.3d 41, 46 (2d Cir. 2018).

95. Hughes v. Talen, 136 S. Ct. 1288, 1294 (2016).

96. *Id.* at 1297.

97. *Id.* at 1298.

98. *Id.*

99. N.Y. Clean Energy Standard Order, *supra* note 83, at 150.

100. Illinois' Future Energy Jobs Act, 20 ILL. COMP. STAT. 3855/1-75(d-5)(1) (2018); 2017 Conn. Acts 17-3 (Spec. Sess.).

101. Scott DiSavino, *N.J. Governor Christie Eyes Nuclear Power Subsidies, Sparks Criticism*, U.S. NEWS (Dec. 8, 2017), https://www.usnews.com/news/us/articles/2017-12-08/nj-governor-christie-eyes-nuclear-power-subsidies-sparks-criticism [https://perma.cc/F2TF-T7S3].

The New York and Illinois ZEC requirements have each survived court challenges.[102] In both cases, opponents of the ZEC approach presented three main arguments against the state program: (1) the ZEC programs interfere with FERC's exclusive jurisdiction over wholesale sales by "effectively replacing" the FERC-regulated wholesale price, (2) the programs distort FERC-regulated market outcomes and thus conflict with FERC's exclusive jurisdiction, and (3) the discriminatory nature of the programs violates the dormant Commerce Clause.[103] The Second and Seventh Circuits found that the New York and Illinois ZEC programs, respectively, were sufficiently different from the facts in *Hughes* because there was no direct link between the state programs and the wholesale RTO markets.[104]

B. Federal Efforts to Support Existing Coal and Nuclear Generation

The Department of Energy took a different tack on the nuclear retirement issue, proposing subsidies for nuclear and coal-fired power plants.[105] The Department of Energy's 2017 Proposed Grid Resiliency Rule instructed FERC to consider compensating these two categories of facilities for their reliability and resiliency attributes.[106] The proposal defined resiliency attributes as the ability to store fuel on-site, thus excluding natural gas and renewable energy facilities.[107]

The proposed rule was subject to widespread criticism.[108] As already noted, the rule was not necessary to ensure grid

102. Coal. for Competitive Elec. v. Zibelman, 906 F.3d 41 (2d Cir. 2018); Elec. Power Supply Ass'n v. Star, 904 F.3d 518 (7th Cir. 2018).

103. *Star*, 904 F.3d at 522; *Zibelman*, 906 F.3d at 46.

104. *Zibelman*, 906 F.3d at 51–52; *Star*, 904 F.3d at 523–24.

105. *See* Devin Henry, *Energy Dept. Report Aims to Boost Coal, Nuclear Power*, HILL (Aug. 23, 2017), http://thehill.com/policy/energy-environment/347730-energy-dept-report-aims-to-boost-coal-nuclear-power [https://perma.cc/DH84-7U7M]; U.S. DEP'T OF ENERGY, *supra* note 76.

106. Grid Resiliency Pricing Rule, 18 C.F.R. pt. 35 (2017). The Department of Energy claimed that the proposed rule would "protect the American people from energy outages expected to result from the loss of this fuel-secure generation." *Id.* at 46941. The Department of Energy has authority to propose rules that FERC must then consider. *Id.*

107. *Id.*

108. Gavin Bade, *Moniz on DOE NOPR: 'No Identification of a Public Good,'* UTIL. DIVE (Jan. 12, 2018), https://www.utilitydive.com/news/moniz-on-doe-nopr-no-identification-of-a-public-good/514700/ [https://perma.cc/C4TR-563F] (quoting

reliability. Analysis of the 2014 polar vortex—an event that Energy Secretary Perry cited as evidence of the need for a grid resiliency rule—showed that coal-fired power plants did not perform consistently during the low temperatures.[109] More recently, electricity grids remained online during a week-long period of low temperatures in January 2018.[110] Further undermining the Department of Energy's rationale for the proposed rule, "coal-fired facilities accounted for nearly half of all forced outages in PJM" during the January 2018 cold snap, and a nuclear power plant in ISO-NE was removed from service.[111] Even the Department of Energy's own analysis of the reliability needs of the electricity grid, published one month prior to the release of the proposed rule, did not conclude that continued operation of coal-fired power plants was necessary for system reliability.[112]

FERC declined to pursue the Department of Energy's proposed price supports.[113] Nevertheless, the Department of Energy's proposed rule remains an important signal regarding the future trajectory of electricity markets. At least one commissioner indicated that he was willing to support the proposed rule, and FERC committed to continue examining reliability concerns.[114]

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former Department of Energy Secretary Ernest Moniz as saying there was "no identification of a public good that merited putting the extra cost on the system"); Steven Mufson, *Bipartisan Group of Former FERC Commissioners Rejects Energy Secretary's Bid to Help Coal Plants*, WASH. POST (Oct. 19, 2017), https://www.washingtonpost.com/news/energy-environment/wp/2017/10/19/former-ferc-commissioners-reject-energy-secretary-perrys-bid-to-help-coal-plants/ [https://perma.cc/H2NT-WJWC].

109. *See* PJM, ANALYSIS OF OPERATIONAL EVENTS AND MARKET IMPACTS DURING THE JANUARY 2014 COLD WEATHER EVENTS 4 (May 8, 2014), https://www.pjm.com/~/media/library/reports-notices/weather-related/20140509-analysis-of-operational-events-and-market-impacts-during-the-jan-2014-cold-weather-events.ashx [https://perma.cc/URF2-NJK4].

110. Susan Miller, *2018 Begins with Record Cold, as Arctic Weather Puts Some New Year's Plans on Ice*, USA TODAY (Jan. 1, 2018, 1:39 AM), https://www.usatoday.com/story/news/2018/01/01/2018-begins-record-cold-arctic-weather-puts-some-new-years-plans-ice/993997001/ [https://perma.cc/E565-6N9Z].

111. Order Terminating Rulemaking Proceeding, Initiating New Proceedings, & Establishing Additional Procedures re Grid Reliability & Resilience Pricing, 162 FERC ¶ 61,012, at 3 (2018) (Glick, Comm'r, concurring) [hereinafter Grid Reliability and Resilience Pricing].

112. U.S. DEP'T OF ENERGY, *supra* note 76.

113. Grid Reliability & Resilience Pricing, *supra* note 111.

114. *Id.* at 17; Julia Pyper, *DOE Official: Agency 'Confident' FERC Will Approve a Coal, Nuclear Pricing Rule*, GREENTECH MEDIA (Nov. 14, 2017), https://

After FERC rejected the Department of Energy proposal, the Trump administration reframed the issue as a grid emergency and a national security concern, invoking provisions of the Federal Power Act and Defense Production Act.[115] A leaked White House memorandum argued that natural gas and petroleum are more vulnerable to national security threats than nuclear and coal because pipelines could be easily disrupted by cyber or physical attacks.[116] According to the memorandum, fuel diversity can help combat this vulnerability. In particular, the memorandum argues that coal and nuclear facilities are less likely to have fuel supply issues, are more capable of ensuring consistent generation, and are capable of storing fuel onsite.[117]

According to the memorandum, the retirement of coal and nuclear plants "undermin[es] the security of the electric power system because the system's resilience depends upon those resources."[118] In addition to arguing for the resiliency benefits of coal and nuclear power, the memorandum emphasizes that nuclear provides strategic and security benefits to the United States because of the military's dependence upon the civilian nuclear industry to support military and strategic uses of nuclear.[119]

As of the publication of this Article, the Trump administration has not released an official order instructing the Department of Energy to pursue these strategies. Nonetheless, Secretary Perry adopted the national security framing in his advocacy for subsidizing coal and nuclear facilities and testified before Congress that market intervention to support economically vul-

www.greentechmedia.com/articles/read/doe-confident-ferc-will-dutifully-consider-adopt-coal-nuclear-rule [https://perma.cc/4Q7A-ZS9V] (stating interim FERC Chairman, Neil Chatterjee, has said he is "sympathetic" to the rule). *But see* Bipartisan Former FERC Commissioners, Comment Letter on Proposed Grid Resiliency Pricing Rule (Oct. 19, 2017), https://s3.amazonaws.com/dive_static/paychek/Comments_of_BFFC_Docket_RM18-1_1.pdf [https://perma.cc/24H8-FU97].

115. Dlouhy, *supra* note 87.

116. Draft Addendum in Support of Dep't of Energy Action 8–9 (May 29, 2018), https://www.documentcloud.org/documents/4491203-Grid-Memo.html [https://perma.cc/RH8H-VJR4].

117. *Id.* at 11–12.

118. *Id.* at 2.

119. *Id.* at 21.

nerable coal and nuclear power plants "is exactly what has to happen."[120]

Dismissing the federal effort due to the lack of evidence to support its purported purpose risks obscuring the underlying point that shifting markets elicit political responses.[121] The Trump administration's attempts to frame the debate around issues of grid reliability and affordability mask the value judgments underlying state and federal responses to changing market conditions. These are proxy battles over core issues of state autonomy, economic development, responses to climate change and other environmental challenges, fuel choices, and the future trajectory of the electric grid.

III. RETHINKING COMPETITION IN TRADITIONALLY REGULATED STATES

Traditionally regulated states are not immune to the factors leading restructured states to reconsider the role of competition. Notably, some of the same challenges that led states to initially consider restructuring are present in today's traditionally regulated states.[122] Low natural gas prices and flat demand growth have resulted in coal plant retirements—and thus job losses—in these states, as well.[123] Falling prices for renewable energy technologies and demands for more choice in electricity generation by residential and commercial stakeholders have led some of these states to also reconsider the role of competition in their electricity sectors.

Traditionally regulated states have more options to soften the impacts and extend the transition period by setting rates that avoid stranded assets and unwanted plant closures. Therefore, if state policy requires a reduction in greenhouse gas

120. Gavin Bade, *Perry: Emergency Order for Coal, Nukes Is 'Exactly What Has to Happen'*, UTIL. DIVE (Apr. 12, 2018), https://www.utilitydive.com/news/perry-emergency-order-for-coal-nukes-is-exactly-what-has-to-happen/521250/ [https://perma.cc/LWH7-F3NS].

121. *See* David B. Spence, *Naïve Energy Markets*, 92 NOTRE DAME L. REV. 973, 981 (2017) (explaining that politics and subsequent statutes passed have greatly influenced the energy market over the years).

122. *See* Ethan Howland, *The Four Greatest Challenges Utilities Face in 2014*, UTIL. DIVE (Dec. 9, 2013), https://www.utilitydive.com/news/the-four-greatest-challenges-utilities-face-in-2014/202574/ [https://perma.cc/9T9S-CXDF].

123. Drew Haerer & Lincoln Pratson, *Employment Trends in the U.S. Electricity Sector, 2008–2012*, 82 ENERGY POL'Y 85 (2015) (finding that the coal industry lost almost fifty thousand jobs during the five-year study period).

emissions and accepts that maintaining existing nuclear power plants is a cost-effective tool for helping the state achieve that goal, the PUC may set rates that ensure the economic viability of the in-state fleet of nuclear units. By contrast, PUCs in competitive markets have limited options for doing so (e.g., approving higher priced contracts between load-serving entities and nuclear facilities).

Despite the ability to achieve some policy goals via rate setting, some traditionally regulated states are grappling with the same challenges of overinvestment and poor risk management that plagued the sector in the 1970s and 1980s.[124] The most glaring examples come from South Carolina, Georgia, and Mississippi. South Carolina is grappling with a financial fallout after the recent cancellation of the VC Summer nuclear project in the state. The two lead utilities had invested approximately $9 billion in the project by the time of cancellation.[125] Southern Company will continue building two new nuclear units at its Plant Vogtle site in Georgia, despite the fact that the project is nearly five years behind schedule and the projected cost is $27 billion—almost twice the original projected cost.[126] Mississippi Power, a Southern Company subsidiary, opted not to complete the coal gasification portion of the Kemper County project that was supposed to gasify coal mined on-site and then capture 65 percent of the carbon emissions.[127] Shareholders will bear the majority of the costs, but ratepayers will still pay $2.5 billion for what is now a 582 MW natural-gas-fired plant, far exceeding the cost of conventional natural gas combined-cycle units.[128]

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124. *See, e.g.*, Kristi E. Swartz, *Skyrocketing Costs Bury Southern Co.*, E&E NEWS: ENERGYWIRE (Feb. 23, 2017), https://www.eenews.net/stories/1060050444 [https://perma.cc/3VNL-TYDS] (discussing rate increases in Mississippi and Georgia).

125. Brad Plumer, *U.S. Nuclear Comeback Stalls as Two Reactors Are Abandoned*, N.Y. TIMES (July 31, 2017), https://www.nytimes.com/2017/07/31/climate/nuclear-power-project-canceled-in-south-carolina.html [https://perma.cc/2PHS-MYZJ].

126. *See* Robert Walton, *Vogtle Nuclear Construction to Continue, Southern Co. Says*, UTIL. DIVE (Aug. 31, 2017), https://www.utilitydive.com/news/vogtle-nuclear-construction-to-continue-southern-co-says/503977/ [https://perma.cc/WS87-XJKP].

127. Megan Geuss, *$7.5 Billion Kemper Power Plant Suspends Coal Gasification*, ARS TECHNICA (June 28, 2017), https://arstechnica.com/information-technology/2017/06/7-5-billion-kemper-power-plant-suspends-coal-gasification/ [https://perma.cc/VVP5-HR9E].

128. David Wagman, *The Three Factors That Doomed Kemper County IGCC*, IEEE SPECTRUM (June 30, 2017), https://spectrum.ieee.org/energywise/energy/

All three states have laws allowing utilities to charge ratepayers during the construction phase for high-cost, high-risk projects.[129] These laws—generally referred to as "Construction Work In Progress," or CWIP, shift risks associated with the projects from the utilities and their investors to ratepayers, risks with which ratepayers in South Carolina, Georgia, and Mississippi are now all too familiar.[130] As of December 2018, the South Carolina state legislature is going so far as to propose reversal of the cost recovery allowed by the state's Baseload Review Act in the aftermath of the canceled construction of two new nuclear units at the VC Summer facility.[131]

Numerous factors contributed to the approval of CWIP cost recovery for the Kemper County, Vogtle, and VC Summer projects. Each project was justified in part by the risk of high gas prices, the prospect of federal climate policy increasing costs for conventional fossil-fuel-fired generation, and expectations of high electricity demand.[132] These factors did not materialize, thus calling into question the robustness of the risk assessments and the PUCs' willingness to approve expensive long-term projects to hedge these risks.[133] The unforeseen shifts in energy markets also had direct impacts on the current economics of the projects.[134] For example, had Congress adopted federal climate legislation and natural gas prices remained high, the South Carolina utilities may have decided to proceed with the VC Summer project despite the cost overruns. The VC

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fossil-fuels/the-three-factors-that-doomed-kemper-county-igcc [https://perma.cc/2Z23-8T48]. In 2016, the Energy Information Administration estimated that the construction cost of a conventional natural gas combined cycle power plant was $978/kw. U.S. ENERGY INFO. ADMIN., CAPITAL COST ESTIMATES FOR UTILITY SCALE ELECTRICITY GENERATING PLANTS 7 (2016), https://www.eia.gov/analysis/studies/powerplants/capitalcost/pdf/capcost_assumption.pdf [https://perma.cc/2NC4-G448]. At that price, the cost of constructing a conventional 582 MW facility would be approximately $570 million.

129. Base Load Review Act, S.C. CODE ANN. § 58-33-210 (2017); MISS. CODE ANN. § 77-3-101 (2018); Georgia Nuclear Energy Financing Act, GA. CODE ANN. § 46-2-25 (2018).

130. *See* Boyd & Carlson, *supra* note 13, at 848.

131. Avery G. Wilks, *SCE&G 'Unlikely' to Go Bankrupt if Rates Slashed After Nuclear Debacle, Reports Says*, STATE (Jan. 19, 2018), http://www.thestate.com/news/politics-government/article195667359.html [https://perma.cc/Y9WG-QMXF].

132. See Monast, *supra* note 27, at 149–56 (discussing the risk hedging allowed by the PUC decisions as a positive development in PUCs interpreting their "least cost" mandates broadly enough to consider the risk of higher costs associated with future environmental regulations).

133. *See, e.g.*, Plumer, *supra* note 125.

134. *Id.*

Summer and Vogtle projects were also impacted by the unanticipated bankruptcy of Westinghouse, the lead contractor for construction of the projects and the developer of the reactor design.[135]

Critics of vertically integrated utilities may view the VC Summer, Vogtle, and Kemper projects as expected outcomes when there is a lack of competitive pressures restraining utilities' willingness to undertake risky projects. There is a reason that construction of the nation's new nuclear units was initiated in traditionally regulated states rather than restructured states. Companies operating in competitive markets would not invest in projects with such long construction times and high construction costs. CWIP does not eliminate risk for the utility. Southern Company shareholders are bearing approximately $6.4 billion of the cost of the gasification portion of the Kemper County facility that Mississippi Power now says it will not operate due to technical malfunctions and the need for additional expenditures that it would not be able to recover through rates.[136] The challenges associated with stranded assets and cost overruns may extend beyond these high-profile examples, depending on how the electricity sector evolves.[137]

Without diminishing the validity of these critiques, the experimentation between different state regulatory approaches is also demonstrating the benefits of the cost-of-service approach in an uncertain investment climate. If state policy calls for reductions in greenhouse gas emissions and the PUC accepts that keeping existing nuclear facilities online is a cost-effective strategy for achieving the emissions goal, the commission can

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135. *See* Tom Hals & Emily Flitter, *How Two Cutting Edge U.S. Nuclear Projects Bankrupted Westinghouse*, REUTERS (May 2, 2017), https://www.reuters.com/article/us-toshiba-accounting-westinghouse-nucle/how-two-cutting-edge-u-s-nuclear-projects-bankrupted-westinghouse-idUSKBN17Y0CQ [https://perma.cc/U8AJ-Y9N2].

136. *See* Darrell Proctor, *Regulators Back Settlement for Costs of Failed Kemper IGCC Project*, POWER (Feb. 6, 2018), http://www.powermag.com/regulators-back-settlement-for-costs-of-failed-kemper-igcc-project/ [https://perma.cc/8ANG-A4FY]; Wagman, *supra* note 128.

137. *See, e.g.*, Emily Hammond & Jim Rossi, *Stranded Costs and Grid Decarbonization*, 82 BROOK. L. REV. 645, 663 (2017) (discussing the relationship between decarbonization policies and stranded assets); *see also* JOACHIM SEEL ET AL., LAWRENCE BERKELEY NAT'L LAB., IMPACTS OF HIGH VARIABLE RENEWABLE ENERGY FUTURES ON WHOLESALE ELECTRICITY PRICES, AND ON ELECTRIC-SECTOR DECISION MAKING (2018), https://emp.lbl.gov/publications/impacts-high-variable-renewable [https://perma.cc/WSY3-5ZZF] (considering the impact of high versus low penetration of variable renewable energy on the electricity grid).

set rates that allow the nuclear facility to continue operating. The PUC may also adjust rates, including via CWIP rate recovery if allowed by state law, to facilitate investments in innovative technologies—the types of projects that may be necessary if the nation is to achieve the aggressive level of emission reductions needed to mitigate catastrophic climate change—that are less likely to occur without certainty regarding cost recovery.[138] Risky innovative energy projects like nuclear energy, carbon capture and storage, and offshore wind corridors are important elements of realizing a low-carbon energy future, and cost recovery is an important aspect of promoting these technologies.[139] Cost recovery through cost-of-service rate setting is a mechanism for doing so.[140]

Policymakers in some traditionally regulated states are seeking a new balance between competition and monopoly to respond to recent developments in electricity markets and consumer demands. Some states are seeking to retain the monopoly structure while creating limited openings for third parties to compete with utilities, and others are considering new efforts to break up electric utility monopolies. The remainder of this section focuses on three such examples: North Carolina's new competitive procurement process for solar energy generation, Nevada's law allowing energy users to exit the monopoly's exclusive service territory, and Nevada's ballot measure on restructuring.[141]

A. *Competitive Procurement for Renewable Energy Generation*

A recent North Carolina statute amending the state's approach to solar energy demonstrates how a state may create

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138. Boyd & Carlson, *supra* note 13, at 848. CWIP as a mechanism is not the problem. The problem is the disincentive to fully vet risks after the initial decision to approve CWIP recovery, a lack of oversight that may follow granting of the CWIP rate recovery, and placing the costs and risks on a relatively small group of ratepayers. Monast & Adair, *supra* note 44.

139. S. Pacala & R. Socolow, *Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies*, 305 SCIENCE 968 (2004) (identifying key available technologies for mitigating greenhouse gas emissions).

140. Boyd & Carlson, *supra* note 13.

141. *See* 2017 N.C. Sess. Laws 192; Assemb. B. 452, 79th Sess. (Nev. 2017).

new opportunities for competition without rejecting the monopoly-utility model.[142]

Three factors led to North Carolina's ranking as the state with the second largest amount of installed solar capacity in the country.[143] The first contributing factor is the federal Public Utilities Regulatory Policy Act (PURPA).[144] Like the laws in other traditionally regulated states, PURPA requires North Carolina's vertically integrated utilities to purchase electricity generated at "qualifying facilities" or QFs (generally renewable energy or combined heat and power facilities with a capacity factor of less than 80 MW) at the utility's avoided cost (the amount the utility would otherwise spend to generate or procure the same amount of power).[145]

The second factor is the state's Renewable Energy and Energy Efficiency Portfolio Standard ("REPS"), which requires that 12.5 percent of electricity sales by the state's regulated utilities be generated by renewable energy by 2021.[146] The law included a specific requirement that a minimum of 0.2 percent of generation should come from solar energy by 2018.[147]

The third factor is a historical holdover. After enactment of PURPA, but prior to the establishment of the state's REPS, the NC Utilities Commission developed a standardized contract

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142. *See* 2017 N.C. Sess. Laws 192.

143. *North Carolina Has More PURPA-Qualifying Solar Facilities Than Any Other State*, U.S. ENERGY INFO. ADMIN. (Aug. 23, 2016), https://www.eia.gov/todayinenergy/detail.php?id=27632 [https://perma.cc/YR8M-WUTU] [hereinafter *North Carolina Has More PURPA-Qualifying Solar*].

144. *Id.* (As of 2016, "1,173 MW, or 92%, of [North Carolina's] 1,271 MW utility-scale PV capacity is certified to have qualifying facility (QF) small power producer status under PURPA, which is more than any state in both absolute and percentage terms.").

145. 16 U.S.C. § 824a-3(e)(1) (2012). "Avoided costs means the incremental costs to an electric utility of electric energy or capacity or both which, but for the purchase from the qualifying facility or qualifying facilities, such utility would generate itself or purchase from another source." 18 C.F.R. § 292.101 (2018).

146. Renewable Energy and Energy Efficiency Portfolio Standard (REPS), N.C. GEN. STAT. § 62-133.8(b)(1) (2017). At the time of passage, the state had two vertically integrated investor-owned utilities (IOUs): Duke Energy and Progress Energy. The two firms subsequently merged and now operate as a single company with two distinct service territories: Duke Energy Carolinas and Duke Energy Progress. *Merger of Progress Energy and Duke Energy Created Largest U.S. Electric Utility*, U.S. ENERGY INFO. ADMIN. (Aug. 22, 2012), https://www.eia.gov/todayinenergy/detail.php?id=7650 [https://perma.cc/W5WQ-FBWS].

147. N.C. GEN. STAT. § 62-133.8(d).

that allowed QFs at 5 MW or less to enter into fifteen-year contracts for a fixed avoided-cost rate.[148]

Together, these factors led to dramatic growth in 5 MW solar energy facilities, with the majority located in the eastern part of the state where land is relatively inexpensive but far away from the areas of higher electricity demand.[149] The utilities found themselves with a queue of five hundred projects awaiting connection to the grid with little (or no) control over location or timing of generation.[150] Furthermore, the fifteen-year contracts locked in prices set at the avoided cost at the time of construction.[151] Because prices for solar panels have fallen significantly since 2008, and the overall avoided cost has decreased as Duke Energy shifted to lower-cost natural gas, utility executives have complained that the standardized contract resulted in higher prices for ratepayers.[152]

There are compelling reasons to offer long-term contracts for renewable energy, as is standard practice in competitive electricity markets.[153] Because there are no fuel costs and low maintenance costs, the primary cost for renewable energy facilities is in the construction phase.[154] Thus, renewable facilities provide price certainty, which itself has value for a utility's generation mix.[155] Although there is short-term variation in power output (e.g., decreased solar generation output during cloudy days), there is general certainty regarding expected av-

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148. *North Carolina Has More PURPA-Qualifying Solar*, *supra* note 143.

149. *See Utility-Scale Solar Powers North Carolina's Economy*, TERRASMART (May 5, 2017), http://www.terrasmart.com/utility-scale-solar-powers-north-carolinas-economy/ [https://perma.cc/Z43Y-CLBW].

150. John Downey, *New Complaints Contend Duke Energy Is Stalling Grid Connections for Solar Projects*, TRIANGLE BUS. J. (June 19, 2017), https://www.bizjournals.com/triangle/news/2017/06/19/new-complaints-contend-duke-stalling-grid.html [https://perma.cc/HB65-KGKB].

151. *North Carolina Has More PURPA-Qualifying Solar*, *supra* note 143.

152. Bruce Chapman, *Duke Energy Says Solar Power Will Cost N.C. Customers $1 Billion Too Much*, CHARLOTTE OBSERVER (Feb. 24, 2017), http://www.charlotteobserver.com/news/local/article134736169.html [https://perma.cc/BL67-EHRS].

153. Leah B. Chacon, Comment, *Long-Term Contracting the Way to Renewable Energy Investment: Lessons from Brazil Applied to the United States*, 62 EMORY L.J. 1563 (2013).

154. *Barriers to Renewable Energy Technologies*, UNION OF CONCERNED SCIENTISTS (Dec. 20, 2017), https://www.ucsusa.org/clean-energy/renewable-energy/barriers-to-renewable-energy [perma.cc/7TW2-KJ3K].

155. *Benefits of Renewable Energy Use*, UNION OF CONCERNED SCIENTISTS (Dec. 20, 2017), https://www.ucsusa.org/clean-energy/renewable-energy/public-benefits-of-renewable-power [https://perma.cc/Y95C-BPDN].

erage generation.[156] Long-term contracts also provide price certainty for the companies constructing the solar facilities by allowing access to capital at lower interest rates.[157] Furthermore, renewable energy contracts can help utilities meet the shifting demands of its ratepayers. North Carolina, like numerous other states, aims to attract new employers whose criteria for site selection include access to clean energy.[158]

The utility may appreciate these factors, but they also run counter to the firm's primary means of delivering value to its shareholders. Cost-of-service ratemaking—ensuring that rates are set at a level that allows the firm to recover the amount invested in infrastructure as well as a rate of return on those investments—rewards capital investments by the utility.[159] Electricity purchased from independent power producers is generally passed on to ratepayers, but utilities do not generally earn a rate of return on those expenditures.[160]

PURPA, the state REPS, and the standardized contract served as exogenous factors that motivated the utility to seek changes to the law. A lengthy stakeholder process resulted in passage of the Competitive Energy Solutions for North Carolina Act (HB 589).[161] The new law includes a competitive procurement process for solar generation,[162] limited opportunities for third-party leasing,[163] a new community solar program,[164] a

156. *Barriers to Renewable Energy Technologies*, *supra* note 154.

157. Chacon, *supra* note 153, at 1611.

158. *See* Sharon E. Burke, *What City Has the Power to Woo Amazon?*, SLATE (Jan. 26, 2018), https://slate.com/technology/2018/01/what-city-has-the-best-energy-policies-for-amazons-headquarters-search.html [https://perma.cc/3SWD-GZLY].

159. Richard J. Pierce, Jr., *Completing the Process of Restructuring the Electricity Market*, 40 WAKE FOREST L. REV. 451, 457 (2005).

160. Electric utilities generally earn a rate of return for capital expenditures. *See, e.g.*, Larry B. Parker et al., *Clean Air Act Allowance Trading*, 21 ENVTL. L. 2021, 2054 (1991) ("Under traditional rate-of-return regulation, electric utilities are entitled to have their revenue requirements met by earning a rate-of-return on capital investments and by recovering necessary operating expenses.").

161. Robert Walton, *North Carolina Passes Solar Reform Bill with 18-Month Wind Moratorium*, UTIL. DIVE (June 30, 2017), https://www.utilitydive.com/news/north-carolina-passes-solar-reform-bill-with-18-month-wind-moratorium [https://perma.cc/9MEY-RHX3].

162. N.C. GEN. STAT. § 62-110.8 (2017).

163. HB 589 limits third-party leases the lesser of 1 MW or 100 percent of contract demand for nonresidential customers, 20 kW or 100 percent of estimated electrical demand for residential customers, and is intended only to offset the customer's electrical consumption at that premises. § 62-126.3(14). Duke Energy may offer leases. § 62-126.5.

solar rebate program for residential customers,[165] and revisions to the standardized contract and to net metering payments.[166] The law also provides additional opportunities for market entrants and includes provisions to respond to consumer demands for renewable energy. Major military installations, the University of North Carolina system, and other large customers may contract for renewable energy.[167]

The key elements of HB 589's competitive bidding process include a renewable energy target, a bidding process that allows third parties and the utilities (or their subsidiaries not subject to rate regulation) to compete, and an independent monitor to ensure that the utility does not control the process by exerting market power. These provide a model for additional competition in traditionally regulated states.[168] The North Carolina law identifies an aggressive target for new solar generation—2.6 GW of nameplate capacity (i.e., the maximum sustained output) over forty five months.[169] Contracts for the new generation will be offered via a series of annual auctions monitored by an independent administrator.[170] The bidding process allows Duke Energy to exert greater control over the location of new solar generation, presumably prioritizing generation that is closer to the population centers, areas with energy-intensive companies such as manufacturing and data centers, or areas where the grid is able to accept additional generation.

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164. § 62-126.8. A community solar facility is a "facility whose output is shared through subscriptions." § 62-126.3(3).

165. § 62-155(f).

166. The law instructs Duke Energy to file revised net metering rates for utility commission approval for customers with leasing arrangements and those who own distributed solar installations. § 62-126.4. The final version of the law also imposed an eighteen-month moratorium on new wind generation. 2017 N.C. Sess. Laws 192, Part XIII.

167. § 62-159.2. Large customers are those with a contract demand equal to or greater than 1 MW at one site or more than 5 MW in aggregate from multiple service locations. § 62-159.2(a). HB 589 establishes generation limits as part of the direct contract provisions. § 62-159.2(c)–(d).

168. The N.C. Utilities Commission will identify the independent market monitor and promulgate rules governing the monitor's role. § 62-110.8.

169. *Id.* Actual generation for a solar facility will be less than the nameplate capacity. *Frequently Asked Questions: What Is the Difference Between Electricity Generation Capacity and Electricity Generation?*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/tools/faqs/faq.php?id=101&t=3 (last updated Feb. 14, 2018) [https://perma.cc/PBA8-NEGR].

170. § 62-110.8(d).

The law allows Duke Energy to develop up to 30 percent of the target capacity, with the remaining 70 percent reserved for development by independent companies.[171] Duke Energy can also purchase facilities constructed by independent companies.[172]

As part of the compromise, HB 589 codified new size limitations for eligibility for the standardized contract. Initially, the size limit shifted from 5 MW to 1 MW.[173] The limit for new facilities located in a specific utility service territory will shrink to 100 kW after installation of 100 MW of new projects.[174] The law also amends the standardized contract by shortening the length of the fixed avoided-cost rate from fifteen years to ten years.[175]

HB 589 does not supersede PURPA. Duke Energy must continue to purchase power from new QFs at the avoided-cost rate set by the state PUC, but the new law incentivizes independent generators to participate in the competitive bidding process in lieu of the PURPA-mandated avoided-cost rates.[176] Under HB 589, winning bids will qualify for a twenty-year contract for a fixed avoided-cost rate, compared to QFs which would be compensated at an avoided-cost rate that could vary over time.[177] The first competitive solicitation closed in October 2018 with winning bids to be announced in March 2019.[178]

B. Allowing Consumers to Exit Utility Service

Recent experience in Nevada demonstrates that large electricity consumers may be willing to pay fines to exit utility

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171. § 62-110.8(b)(4).
172. *Id.*
173. § 62-156(b)(1).
174. Duke Energy has two service territories in North Carolina: Duke Energy Carolinas or Duke Energy Progress.
175. § 62-110.8(b)(1).
176. *See* 16 U.S.C. § 2621 (2012).
177. N.C. GEN. STAT. § 62-110.8(b)(3). These provisions do not apply to swine and poultry waste facilities. § 62-156(c). These facilities are eligible for terms longer than five years and expedited interconnection reviews. *Id.*; § 62-133.8(i)(4).
178. John Downey, *Duke Energy Starts Up Bids and Rebates for Solar*, CHARLOTTE BUS. J. (July 10, 2018), https://www.bizjournals.com/charlotte/news/2018/07/10/duke-energy-starts-up-bids-and-rebates-for-solar.html [https://perma.cc/M6KF-7DBZ]; *Duke Energy Carolinas (DEC) Competitive Procurement of Renewable Energy Program (CPRE) Request for Proposal (RFP)—600 MW*, ACCION GRP., https://decprerfp2018.accionpower.com/_rfp_1801/calendar.asp (last visited Oct. 28, 2018) [https://perma.cc/2FSA-EVAN].

service in exchange for greater access to renewable energy, creating both a cautionary tale for monopoly utilities and the motivation to be more responsive to shifting consumer demands.[179] In 2015, the Nevada PUC determined that three casinos could exit NV Energy's system (the local monopoly utility) after paying an exit fee.[180] The opportunity to do so was created by a 2001 law adopted in the aftermath of the Enron scandal.[181] Until recently, no companies sought to exit the utility's service and the PUC had not clarified the process for doing so.[182] Switch, a data company located in Las Vegas, petitioned for the same opportunity as that afforded to the casinos.[183] The Nevada PUC denied the petition, and Switch sued for damages and the right to exit the utility.[184] The

179. *See, e.g.*, Sean Whaley, *MGM Resorts to Leave Nevada Power, Pay $86.9M Exit Fee*, LAS VEGAS REV.-J. (May 19, 2016), https://www.reviewjournal.com/business/energy/mgm-resorts-to-leave-nevada-power-pay-86-9m-exit-fee/ [https://perma.cc/64CV-Q8NY]. The prospect of larger electricity purchasers exiting a utility's service territory is not limited to the Nevada example. In December, for example, a Colorado electric cooperative requested that the Colorado PUC establish an exit charge to allow the co-op to leave the Tri-State Generation and Transmission Association. *See Delta-Montrose Electric Association Files with PUC Seeking Just and Reasonable Exit Charge from Tri-State*, DMEA (Dec. 6, 2018), http://www.dmea.com/content/delta-montrose-electric-association-files-puc-seeking-just-and-reasonable-exit-charge-tri [perma.cc/2TAD-U3M7]. The co-op justified its request on disputes regarding electricity rates and renewable energy investments. *Id.*

180. Pub. Util. Comm'n of Nev., Order Approving Application of Wynn Las Vegas, LLC to Purchase Energy, Capacity, and/or Ancillary Services from a Provider of New Electric Resources, No. 15–05006 (Dec. 3, 2015); Pub. Util. Comm'n of Nev., Order Approving Application of Las Vegas Sands Corp. to Purchase Energy, Capacity, and/or Ancillary Services from a Provider of New electric Resources, No. 15–05002 (Dec. 3, 2015); Pub. Util. Comm'n of Nev., Order Approving Application of MGM Resorts International to Purchase Energy, Capacity, and/or Ancillary Services from a Provider of New Electric Resources, No. 15–05017 (Dec. 3, 2015); Herman K. Trabish, *Major Las Vegas Resorts Get Price Tag for Grid Defection*, UTIL. DIVE (Aug. 21, 2015), https://www.utilitydive.com/news/major-las-vegas-resorts-get-price-tag-for-grid-defection/404372/ [https://perma.cc/Z42B-YG95].

181. NEV. REV. STAT. § 704B (2017).

182. Kyle Roerink, *Casinos Have Few Options After PUC Exit Decision*, LAS VEGAS SUN (Dec. 3, 2015), https://lasvegassun.com/news/2015/dec/03/casinos-have-few-options-after-puc-exit-decision/ [https://perma.cc/SJA9-WJCZ].

183. Pub. Util. Comm'n of Nev., Order Denying Application of Switch Ltd. to Purchase Energy, Capacity, and/or Ancillary Services from a Provider of New Electric Resources, No. 14–11007 (June 11, 2015).

184. *Id.*; Switch, Ltd. v. Nev. Power, 2:16-CV-01629 (D. Nev. July 12, 2016); Daniel Rothberg, *Switch Sues PUC, NV Energy for $30 Million in Damages, Permission to Leave Utility*, LAS VEGAS SUN (July 12, 2016), https://lasvegassun

companies and Nevada PUC Regulatory Operations staff reached a settlement shortly after Switch filed the lawsuit.[185] As part of the agreement, the utility agreed to construct a 100 MW solar energy facility and provide 100 percent renewable power to the Switch facility via the new solar facility, geothermal power, and wind power.[186]

On October 1, 2016, two major casinos departed NV Energy's service territory, paying a collective $100 million exit fee and accepting the prospect of additional fees over a six-year period.[187] Together, these two companies accounted for approximately 6 percent of NV Energy's electricity demand.[188]

Utilities have obvious reasons to resist departure of large customers. Lower electricity demand means less need for generation. This, in turn, may leave power plants idle and utilities unable to pay off the facilities.[189] Also, utility rates are volumetric to allow utilities to recover fixed costs. The more demand for electricity, the lower the cost of each unit of electricity. Electricity demand may decrease due to efficiency improvements or when large consumers meet their demand using independent electricity, but the fixed costs remain constant. The utility's remaining ratepayers may also face negative impacts, as the amount charged per unit of electricity must increase if utilities are to recover their costs.[190] The Nevada PUC sought to mitigate rate impacts on the remaining ratepayers, includeing provisions allowing future fees as the true costs of the casinos' decisions become apparent. Although the fees may prevent rate increases, the lost revenue may leave the utility with fewer resources to invest in infrastructure and renewable en-

.com/news/2016/jul/12/switch-sues-puc-nv-energy-for-30-million-in-damage/ [https://perma.cc/5C7U-9P2D].

185. Pub. Util. Comm'n of Nev., Stipulation to the Application of Switch Ltd. to Purchase Energy, Capacity, and/or Ancillary Services from a Provider of New Electric Resources, No. 14–11007 (July 10, 2015).

186. Kyle Roerink, *Switch and NV Energy Strike Deal to End Battle*, LAS VEGAS SUN (July 14, 2015), https://lasvegassun.com/news/2015/jul/14/switch-and-nv-energy-hash-deal-end-battle/ [https://perma.cc/KS9K-QQGX].

187. Daniel Rothberg, *MGM Resorts, Wynn to Stop Purchasing NV Energy Power Saturday*, LAS VEGAS SUN (Sept. 30, 2016), https://lasvegassun.com/news/2016/sep/30/mgm-resorts-wynn-stop-purchasing-nv-energy-power/ [https://perma.cc/PMW4-A7MH].

188. *Id.*

189. *See* Monast, *supra* note 27, at 172.

190. *See id.*

ergy projects and thus create incentives for other customers to follow the example of the casinos.

C. Renewed Efforts to Break Up Vertically Integrated Monopolies

Following the casinos' exit, Nevadans approved the Energy Choice Initiative—a ballot measure to amend the Nevada Constitution to "establish[ ] . . . an open, competitive retail electric energy market that prohibits the granting of monopolies and exclusive franchises for the generation of electricity."[191] Implementation required a second passage in 2018, which voters rejected.[192] If voters had approved the measure a second time, it would have required the state's legislature to enact legislation by July 1, 2023 that restructured the electricity sector and "include[d] provisions to reduce costs to customers, protect against service disconnections and unfair practices, and prohibit the granting of monopolies and exclusive franchises for the generation of electricity."[193]

The ballot measure caused energy stakeholders in the state to grapple with the same issues that have arisen in states that previously restructured their electricity sectors. NV Energy, the state's largest electricity provider and a rate-regulated monopoly, released principles that it believed should guide any restructuring process, including protecting the utility from stranded assets.[194]

The Nevada ballot measure is another cautionary tale for electric utilities. Increased costs arising from cancelled nuclear power plants in the 1970s and 1980s are viewed as a contributing factor that led states to consider restructuring.[195] Simi-

191. Barbara K. Cegavske, Secretary of State for the State of Nevada, Statewide Ballot Questions 2016, at 34 (2016), https://www.leg.state.nv.us/Division/Research/VoteNV/BallotQuestions/2016.pdf [https://perma.cc/T6XG-U9U5].

192. Associated Press, *Nevadans Approve All but One Statewide Question*, KOLO (Nov. 7, 2018, 12:07 PM), https://www.kolotv.com/content/news/nevadans-approve-all-but-one-statewide-question-499964552.html [https://perma.cc/V45U-WGRF].

193. *Id.*

194. NV ENERGY, NEVADA'S ENERGY FUTURE: KEY PRINCIPLES 2 (2016), https://www.nvenergy.com/brochures_arch/key-principles.pdf [https://perma.cc/DVL5-JX54].

195. *See, e.g.*, Jim Rossi, *The Political Economy of Energy and Its Implications for Climate Change Legislation,* 84 TUL. L. REV. 379, 406 (2009) ("Price gaps and cost differentials between different geographic areas changed the incentives for

lar circumstances now exist in South Carolina, Georgia, and Mississippi due to cancelled projects and significant cost overruns. Prior to the 2018 election, NV Energy responded to the threat of the Energy Choice Initiative by committing to double its renewable energy capacity by 2023 if voters rejected the proposed change.[196]

IV. LESSONS FOR ELECTRICITY-SECTOR COMPETITION

Competition will continue to steer the evolution of the electricity sector in both restructured and traditionally regulated markets.[197] The questions going forward are what form competition takes and what constraints public policy places on the scope of competition.[198] Maximizing societal benefits in both restructured and traditionally regulated states depends on recognizing, and mitigating, instances when regulatory and market-design choices interfere with public goals.

The range of options available to states and the demonstrated willingness on the part of federal and state officials to alter market rules highlight the importance of incorporating social and environmental policy goals into energy markets. Even if ZECs ultimately fail judicial scrutiny, states can implement a number of measures to influence competitive markets, including "tax credits, land grants, direct subsidies, construction of state-owned generation facilities, or reregulation of the energy sector."[199] Power-purchase agreements—bilateral contracts for electricity—may also skirt broader market com-

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interest groups—consumers and new entrants, such as independent power producers—to look for relief beyond the framework of price regulation by state and local utility commissions."). According to analysis by Matthew White, states with modest gaps between retail and wholesale rates would opt to maintain traditional rate regulation. White, *supra* note 38, at 238.

196. Robert Walton, *NV Energy to Double Renewable Capacity—If Voters Reject Retail Choice*, UTIL. DIVE (June 1, 2018), https://www.utilitydive.com/news/nv-energy-to-double-renewable-capacity-if-voters-reject-retail-choice [https://perma.cc/B5UP-HQPB].

197. Shi-Ling Hsu, *Capital Rigidities, Latent Externalities*, 51 HOUS. L. REV. 719, 777 (2014) ("Crucial in a shift to a new electricity paradigm is the opening up of electricity markets to new entrants, and the introduction of competition for electricity consumers."); Boyd, *supra* note 19, at 1635–36.

198. Achieving environmental goals or employment goals via reactive market changes may lack the support necessary for long-term success if consumers find themselves paying higher prices for attributes that they were not aware of and may not agree are worth the cost.

199. Hughes v. Talen Energy Mktg., LLC, 136 S. Ct. 1288, 1299 (2016).

petition.[200] States may seek to reincorporate some power plants into a utility's rate base.[201] States may also withdraw their utilities from RTO markets altogether and return to cost-of-service rate making, as a power company urged Ohio lawmakers to consider in 2016.[202]

On the other end of the electricity-market spectrum, the Nevada experience demonstrates the potential for voters to demand choices if vertically integrated utilities fail to provide the benefits available to consumers in restructured states or ratepayers face higher costs due to cancelled projects. The South Carolina legislature, for example, is considering numerous proposals for allocation of the sunk costs, and some stakeholders are advocating that the state consider restructuring the electricity sector.[203]

This Section discusses four critical lessons for the future of the electricity sector. First, core societal values continue to drive electricity-sector policy and will have direct impacts on the evolution of the sector. Second, case-by-case efforts to support specific existing facilities are resulting in a post hoc cost-of-service approach without direct PUC oversight of system needs and rates. While this approach may be justified in some circumstances, ensuring that market interventions deliver

200. *See* Elec. Supply Power Ass'n v. FirstEnergy Sols. Corp., 155 FERC ¶ 61,101 (2016); Elec. Power Ass'n v. AEP Generation Res., 155 FERC ¶ 61,102 (2016).

201. *See, e.g.*, Mont. State Pub. Serv. Comm'n, Order No. 7323K, Final Order in the Matter of the Application of NorthWestern Energy for Hydro Assets Purchase, No. D2013.12.85, at 4 (Sept. 26, 2014) (Travis Kavulla, dissenting) (discussing the implications of reincorporating an asset into a utility's rate base).

202. *Elec. Supply Power Ass'n*, 155 FERC ¶ 61,101 (2016); Gavin Bade, *Re-Regulation on the Horizon? State Plant Subsidies Point to Looming 'Crisis' in Organized Power Markets*, UTIL. DIVE (Oct. 20, 2016), https://www.utilitydive.com/news/re-regulation-vertically-integrated-utility/428639/ [https://perma.cc/B6FP-TZ5J]; Tom Knox, *Frustrated AEP CEO: Ohio Should Reverse Energy Deregulation or We'll Sell Our Plants; 'No Interest' in Prolonged Debate with FERC*, COLUMBUS BUS. FIRST (Apr. 28, 2016), https://www.bizjournals.com/columbus/news/2016/04/28/frustrated-aep-ceo-ohio-should-reverse-energy.html [https://perma.cc/B6FP-TZ5J].

203. S. 890, 2018 Leg., 122nd Sess. (S.C. 2018); Avery G. Wilks, *Gov. McMaster's Lack of Leadership to Blame for Nuclear Crisis, Rival Says*, STATE (Mar. 15, 2018), https://www.thestate.com/news/politics-government/article205030769.html [https://perma.cc/74NP-YAPG] (listing electricity sector deregulation as part of a Republican gubernatorial candidate's platform); *How to Free South Carolina's Energy Market*, S.C. POL'Y COUNCIL (Apr. 9, 2014), https://www.scpolicycouncil.org/research/taxes/energy-deregulation [https://perma.cc/E7FY-PWGG] (advocating that the state "completely deregulate the energy industry").

social benefits requires explicit consideration of the economic and environmental tradeoffs. Third, ZEC programs and the Trump administration's proposed subsidies are reactions to electricity prices falling below the level necessary to deliver social benefits. Without proactive measures to help communities weather economic impacts and ensure that states achieve environmental goals, reactive, case-by-case responses will likely continue. Finally, policymakers in traditionally regulated states may harness market forces to deliver new benefits to ratepayers without rejecting the monopoly utility model.

A. *Enduring Value Choices*

Electricity regulation has reflected important value choices since the emergence of the electric utility in the early 1900s.[204] Initial oversight focused primarily on the core pillars of affordability, reliability, and nondiscriminatory access. These factors continue to define the role of state PUCs and FERC.[205]

Over time, society has added expectations to these core objectives, such as economic development, protecting public health, mitigating climate change, incentivizing innovation, and fostering consumer choice.[206] This range reflects the sector's broad societal impacts. Reducing emissions results in cleaner air.[207] Affordable electricity rates may be a key criterion for incentivizing economic development.[208] Jobs created by

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204. FELIX FRANKFURTER, THE PUBLIC AND ITS GOVERNMENT 81 (1930).

205. Monast, *supra* note 27, at 141–42 (describing the role of the PUC). These self-described economic regulators focus primarily on rate design for efficient achievement of these goals.

206. U.S. DEP'T OF ENERGY, *supra* note 76, at 11 ("Society places value on attributes of electricity provision beyond those compensated by the current design of the wholesale market.").

207. *See, e.g.*, Jonathan Baert Wiener, *On the Political Economy of Global Environmental Regulation*, 87 GEO. L.J. 749, 752 (1999) ("Clean air is a classic example of a public good."); Timothy Besley & Maitreesh Ghatak, *Public Goods and Economic Development* (July 27, 2004) (manuscript later published in UNDERSTANDING POVERTY (Abhijit Vinayak Banerjee et al. eds., 2006)), http://personal.lse.ac.uk/GHATAK/public.pdf [https://perma.cc/2SK7-YDYM]. *But see* Hsu, *supra* note 197, at 775 ("[E]conomic development generally has detracted from what should be the focus of government provision and subsidization: public goods.").

208. *See, e.g.,* Bob Mayti, *Heartland Incentive Rate Sows Economic Development Seeds*, AM. PUB. POWER ASS'N (Feb. 13, 2018), https://www.publicpower.org/periodical/article/heartland-incentive-rate-sows-economic-development-seeds [https://perma.cc/V464-UFSW] (crediting an economic development incentive rate as contributing to economic growth).

construction and operation of large power plants also lay the foundation for delivery of public goods afforded by increased wealth in communities.[209] Improvements in energy efficiency may reduce household energy bills and produce health benefits.[210] Mitigating climate change (a classic public goods challenge) will deliver economic and environmental benefits on a broader scale.[211]

The shifting dynamics of electricity markets are undermining public policy goals. Lost jobs associated with operating the plants and, in the context of coal-fired power plants, the impacts on production and transport of coal are causing significant local economic impacts.[212] In some communities, the power plants are among the largest employers.[213] Although increased construction of renewable energy facilities and infrastructure investments are mitigating net energy job losses, the

209. Louis Kaplow, *Public Goods and the Distribution of Income* (Nat'l Bureau of Econ. Research, Working Paper No. 9842, July 2003), https://www.nber.org/papers/w9842 [https://perma/cc/DNL8-264L].

210. *3 Health Benefits to Weatherizing Your Home*, U.S. DEP'T OF ENERGY, OFF. OF ENERGY EFFICIENCY & RENEWABLE ENERGY (Oct. 26, 2017), https://energy.gov/eere/articles/3-health-benefits-weatherizing-your-home [https://perma.cc/5FFN-JJ9F].

211. *Climate Action Benefits: Key Findings*, EPA, https://www.epa.gov/cira/climate-action-benefits-key-findings (last visited Dec. 9, 2018) [https://perma.cc/Y528-ZWHV]. Markets are now achieving a similar level of decarbonization as would have been required had the 2009 Waxman-Markey Bill become law. In other instances public goods are a direct result of operational choices by electricity sector participants. For example, frequency regulation that is a critical component of reliability has been characterized as a public good. *See, e.g.*, WILLIAM SCHULTZE ET AL., FACILITATING ENVIRONMENTAL INITIATIVES WHILE MAINTAINING EFFICIENT MARKETS AND ELECTRIC SYSTEM RELIABILITY, FINAL PROJECT REPORT, PSERC DOCUMENT 09-9, at 6 (Oct. 2009), https://certs.lbl.gov/sites/all/files/pserc-facilitating-environ-initiatives-2009.pdf [https://perma.cc/A453-9E4V] (citing voltage maintenance as a public good); Lynne Kiesling & Michael Giberson, Presentation on Electric Network Reliability as a Public Good at Carnegie Mellon University Conference on Electricity Transmission in Deregulated Markets (Dec. 15–16, 2004), https://www.ece.cmu.edu/~electriconf/2004/Kiesling%20Giberson%20-%20Reliability%20as%20a%20Public%20Good%202004NOV15.pdf [https://perma.cc/R7K2-L7C4]; Paul Joskow & Jean Tirole, *Reliability and Competitive Electricity Markets* 5 (Nat'l Bureau of Econ. Research, Working Paper No. 10472, May 2004) ("[Electricity] system collapses . . . create a rationale for network support services with public goods characteristics.").

212. *See* James Van Nostrand, *Why the U.S. Coal Industry and Its Jobs Are Not Coming Back*, YALE ENV'T 360 (Dec. 1, 2016), https://e360.yale.edu/features/why_us_coal_industry_and_its_jobs_are_not_coming_back [https://perma.cc/E9CG-RLX4] (explaining many reasons for why lost coal jobs are not coming back).

213. *See* Justin Worland, *Coal's Last Kick*, TIME (Mar. 18, 2017), http://time.com/coals-last-kick/ [https://perma.cc/G3C6-33BB] (describing how the severe impact of lost coal jobs in West Virginia is due to the strong reliance on the industry).

different locations of the newer jobs and the different expertise required for those jobs means that the opportunities are often not interchangeable.[214]

Early retirement of nuclear power plants also directly impacts electricity-sector greenhouse gas emissions. For example, emissions in the ISO-NE service territory rose 7 percent after the closure of the Vermont Yankee nuclear facility, halting a trend of falling emissions in the region.[215]

Some observers may be tempted to dismiss ZECs and Trump administration proposals as simply rent seeking by influential firms and political maneuvering by elected officials concerned about the electoral impacts of plant closures. There is evidence to support these claims.[216] Subsidies for economically vulnerable nuclear and coal-fired power plants result in higher electricity prices for ratepayers and benefit only a few facilities in a state.[217] A single company owns many of the facilities that benefit from the ZEC requirements and has been advocating for financial support for its nuclear power plant for years.[218]

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214. *See* Nadja Popovich, *Today's Energy's Jobs Are in Solar, Not Coal*, N.Y. TIMES (Apr. 25, 2017), https://www.nytimes.com/interactive/2017/04/25/climate/todays-energy-jobs-are-in-solar-not-coal.html [https://perma.cc/4H3L-4UEH] (providing maps of and information on where different types of energy jobs are being created in the United States).

215. William Opalka, *CO2 Emissions Increase in ISO-NE: Loss of Nuclear Plant Reverses Trend*, RTO INSIDER (Feb. 22, 2016), https://www.rtoinsider.com/co2-new-england-22278 [https://perma.cc/82M7-DVEK] ("CO_2 emissions in ISO-NE had declined 26% from 2001 through 2014.").

216. There is an argument that the price supports for the Millstone plant in Connecticut are pure rent seeking. According to an MIT study, the Millstone plant is among the most profitable nuclear facilities operating in competitive markets. Geoffrey Haratyk, *Early Nuclear Retirements in Deregulated U.S. Markets: Causes, Implications and Policy Options* 6 (MIT Ctr. for Energy & Envtl. Policy Research, Working Paper No. 2017-009, Mar. 2017). The governor has ordered the state to conduct its own analysis of the facility's financial viability. Conn. Exec. Order No. 59 (July 25, 2017), https://portal.ct.gov/-/media/32CB330A0E0B415284EB60E71C54C1A6.pdf [https://perma.cc/MB2A-SX4Y].

217. Elec. Power Supply Ass'n v. Star, No. 17 CV 1163-64, 2017 WL 3008289, at *4–5 (N.D. Ill. July 14, 2017); Coal. for Competitive Elec. v. Zibelman, 272 F. Supp. 3d 554, 562–63 (S.D.N.Y. 2017).

218. N.Y. Clean Energy Standard Order, *supra* note 83; Tomich & Rahim, *supra* note 90 (stating that Exelon will receive an estimated $500 million annually from ZEC payments). Exelon has engaged in a years-long lobbying effort in Illinois to win state subsidies. *See* Jeffrey Tomich, *Bill to Save Exelon Nuclear Plants Proposes Vast Rewrite of Ill. Law*, E&E NEWS (Nov. 16, 2016), https://www.eenews.net/stories/1060045842 [https://perma.cc/C7ZE-Y4ZY].

The Trump administration's claims that coal and nuclear subsidies are required to ensure reliability are even more susceptible to the rent seeking and political posturing criticisms. President Trump has made no secret of his intent to pursue his campaign promise to protect coal-related jobs.[219] If implemented, the administration's efforts will also benefit a small number of established market participants and hinder market actors that are benefitting from current energy prices.

Yet, characterizing these efforts as raw politics or rent-seeking fails to appreciate the forces that laid the groundwork for the alleged rent seeking to be successful.[220] Despite their differences, ZECs and the Trump administration proposals are responses to economic impacts and, in the case of ZECs, environmental impacts caused by the unanticipated shifts in energy markets. These responses are important reminders that policymakers will continue to intervene in electricity markets when those markets are not achieving core social and political goals. As Professor David Spence observed in 2008, restructured energy markets cannot survive without political support and obvious near-term benefits.[221]

B. Hybrid Cost-of-Service Interventions

The current suite of state ZEC requirements contribute to state decarbonization goals by supporting economically vulnerable nuclear power plants. The New York Clean Energy Standard, for example, explicitly links the supply of ZECs to the historic electricity output at three economically vulnerable nuclear power plants but withholds ZEC payments for the state's fourth nuclear facility because it was deemed financially viable.[222] In Connecticut, the new ZEC requirements aim to keep

219. Darryl Fears, *Trump Promised to Bring Back Coal Jobs. That Promise 'Will Not Be Kept,' Experts Say.*, WASH. POST (Mar. 29, 2017), https://www.washingtonpost.com/news/energy-environment/wp/2017/03/29/trump-promised-to-bring-back-coal-jobs-that-promise-will-not-be-kept-experts-say/ [https://perma.cc/2FDH-TBG7].

220. *See* Spence, *supra* note 121, at 981 (explaining that politics and subsequent statutes passed have greatly influenced the energy market over the years).

221. Spence, *supra* note 29, at 795.

222. *See* N.Y. Clean Energy Standard Order, *supra* note 83, at 130, 155–57; *see also* Scott DiSavino, *N.Y. Regulators Approve Clean Energy Standard with Nuclear Subsidies*, REUTERS (Aug. 1, 2016), https://www.reuters.com/article/us-new-york-nuclear-idUSKCN10C2Z6 [https://perma.cc/EM2P-JGPB].

one nuclear facility operational.[223] Like New York, the Illinois ZEC payments support two facilities that would otherwise retire but do not apply to nuclear units that are financially sound.[224] These approaches are not substantially different from traditional PUC rate cases, wherein state commissions determine the revenue requirements of regulated utilities and set rates at a level that allows utilities to remain financially viable.[225] In both instances, power plant operators receive compensation at a level sufficient to cover operating expenses and provide a level of profits for the firms.

The similarities between market interventions in competitive electricity markets and traditional PUC rate cases do not mean that the interventions are unjustified. For example, the New York PSC estimates a $4 billion benefit in the first two years of the ZEC program, primarily in terms of mitigating greenhouse gas emissions, compared to a cost of $1 billion.[226] Based on this analysis, direct compensation for low-carbon baseload generation is a cost-effective strategy to achieve near-term state decarbonization goals.[227] Furthermore, state measures to prevent early retirement of key nuclear power plants may be the only viable strategy to meet the goals.[228]

223. *See* Peter Maloney, *Dominion's Millstone Nuclear Plant Could Warrant Subsidies, Draft Report Says*, UTIL. DIVE (Jan. 23, 2018), https://www.utilitydive.com/news/dominions-millstone-nuclear-plant-could-warrant-subsidies-draft-report-s/515406/ [https://perma.cc/7V3W-X57Z].

224. Vill. of Old Mill Creek v. Star, No. 17 CV 1163–64, 2017 WL 3008289 (N.D. Ill. July 14, 2017); *Nuclear Plants Account for More than Half of Electricity Generation in Illinois*, U.S. ENERGY INFORMATION ADMIN. (May 5, 2017), https://www.eia.gov/todayinenergy/detail.php?id=31092 [https://perma.cc/EH8C-EKNN] (noting that Exelon announced plans to retire two nuclear power plants in Illinois but canceled the plans after the state enacted the ZEC program); Complaint at 2–3, Coal. for Competitive Elec. v. Zibelman, 272 F. Supp. 3d 554 (S.D.N.Y. 2017); S.B. 2814, 99th Gen. Assemb., Reg. Sess. (Ill. 2016).

225. *See* Monast, *supra* note 27, at 145 ("[T]he rates must allow utilities to recover costs that were prudently incurred, maintain the financial integrity of the firm, compensate equity investors for the risks they assume, and enable the firm to attract needed capital.").

226. Tomich & Rahim, *supra* note 90 (citing figures from the July 8, 2016 New York PSC proposal).

227. N.Y. Clean Energy Standard Order, *supra* note 83.

228. *Id.* at 19 ("[L]osing the carbon-free attributes of this generation before the development of new renewable resources between now and 2030 would undoubtedly result in significantly increased air emissions due to heavier reliance on existing fossil-fueled plants or the construction of new gas plants to replace the supplanted energy.").

Although this article presents ZECs as a case study on the motivations for post hoc market interventions, ZEC implementation also provides a model for incorporating a cost-of-service approach into competitive markets. The New York PSC implemented ZEC requirements after a lengthy and detailed process. The PSC retains oversight of the program and may adjust it if necessary. The ZEC payments are directly related to pre-existing state decarbonization goals and the PSC determined that ZECs are the only viable option to achieve those goals. The program delivers additional benefits, such as job protection for power plant employees. These measures suggest criteria for determining whether market interventions are necessary and justifying the costs imposed on ratepayers and other market participants.

The White House proposals, on the other hand, demonstrate the potential to abuse the strategy of compensating power plants for particular attributes (e.g., on-site fuel supplies). As discussed above, these proposals purportedly seek to maintain a reliable electricity sector but are instead motivated by campaign promises and rapid shifts in the economics of coal-fired power plants. The Trump administration's efforts are not necessary to ensure a reliable electricity system, and there is little evidence to support the claims that a grid emergency is imminent if existing coal and nuclear power plants retire.

Even in instances where a post hoc cost-of-service approach is justified, there are financial, social, and environmental tradeoffs that government officials should consider before intervening.[229] Companies operating in competitive markets make investments based on existing market rules and reasonable expectations about the future. When policymakers implement subsidies to prevent plant retirements that would otherwise occur due to market dynamics, the generation sources that otherwise would outcompete the subsidized plants may lose market share, or at least fail to gain market share after nuclear facilities retire.[230] Ratepayers will also face higher costs.

229. *See New York Electricity Supply Costs to Increase in 2017–PSC Approves Clean Energy Standard, Subsidizes Upstate Nuclear Power*, ENERGY WATCH (Aug. 3, 2016), https://energywatch-inc.com/new-york-electricity-supply-costs-increase-2017-psc-approves-clean-energy-standard-subsidizes-upstate-nuclear-power/ [https://perma.cc/JB3J-N5KW].

230. Saqib Rahim & Jeff Tomich, *Dynegy Forges On in Turbulent Power Markets, CEO Says*, E&E NEWS: ENERGY WIRE (Feb. 1, 2018), https://www.eenews.net/energywire/2018/02/01/stories/1060072589 [https://perma.cc/8LFD-BCPS].

For example, Bloomberg projects an annual cost of up to $3.9 billion if all nuclear power plants in the Northeast and Mid-Atlantic states—all states relying on RTO-managed competitive electricity markets—receive subsidies at the same level as those currently available in New York.[231]

Furthermore, subsidizing economically vulnerable power plants in competitive markets could constrain the role of emerging energy options, such as utility-scale storage.[232] In contrast to emissions markets, which allow market participants to determine the lowest cost strategy to comply with emission limits, compensating existing power plants for certain attributes does not incentivize other actors to take steps to reduce emissions or improve reliability.

A dissenting opinion in a 2014 Montana PSC decision to reincorporate a hydroelectric facility into a utility's rate base highlights another concern with requiring supplemental compensation to protect power plants in competitive electricity markets. As then-chair of the PSC stated:

> The Commission's Order turns the free market on its head. . . . The proposition that underlies this business transaction then, is simple: The government (i.e., this Commission) is severing the bond between an asset's performance relative to the market and the revenues the asset's owner will earn. In so doing, the Commission unencumbers the shareholders of the merchant utility from a risk and authorizes a generous payment to them. At the same time, the Commission redistributes that risk (which has never gone away, only moved) by socializing it to the monopolized customer base of the regulated utility. . . .

231. Jonathan Crawford, *U.S. Consumers May Be $3.9 Billion 'Losers' From Nuclear Aid*, BLOOMBERG MKTS. (Mar. 21, 2017), https://www.bloomberg.com/news/articles/2017-03-21/consumers-would-be-3-9-billion-losers-from-nuclear-subsidies [https://perma.cc/ZUC3-B4U6].

232. Cost-effective utility scale storage projects are beginning to emerge. For example, a recent Xcel solicitation for a storage project returned an "unprecedented" response, with some prices falling well below the cost of storage power purchase agreements finalized in 2017. Robert Walton, *Xcel Solicitation Returns 'Incredible' Renewable Energy, Storage Bids*, UTIL. DIVE (Jan. 8, 2018), https://www.utilitydive.com/news/xcel-solicitation-returns-incredible-renewable-energy-storage-bids/514287/ [https://perma.cc/TQL7-EWRA] ("Wind energy with battery storage was bid at $21/MWh, just $3 higher than wind-only. In [a 2017] Arizona deal . . . the addition of storage added about $15/MWh to the power purchase agreement bid.").

> There are few precedents for a government to do what we are doing. Only a relatively short time after the divestiture of this property to the free market, we are marching back in, removing it and its production from the marketplace, and shackling it to a captive set of customers at a substantial mark-up from its book value (an "acquisition premium" in the phraseology that has been presented to us).[233]

The same critique applies to the Trump administration's proposed subsidies. Even though the subsidies would not reincorporate power plants into a utility's rate base, they would shift risk from power plant operators to ratepayers and other market participants.

Furthermore, federally imposed market subsidies forgo the benefit of oversight by a system operator or PUC. Regional transmission operators (RTOs)[234] and utility commissions consider power plant compensation in light of overall system needs. The approaches have flaws, as described above. Nonetheless, there is a common set of criteria applied to questions of power plant value and compensation.

C. *Implicit Market Floors for Economic and Environmental Goals*

Efforts to ensure the economic viability of existing nuclear and coal-fired power plants in competitive electricity markets expose two gaps created by low wholesale electricity prices: job protection and environmental protection. Had prices remained high enough to keep the nuclear (and in the case of the Department of Energy's proposed rule, coal-fired) facilities operating, price supports presumably would not be in place at the state level or proposed at the federal level. This suggests that there is an implicit market floor for the provision of social goods in competitive electricity markets—that is, a price point below which electricity markets are no longer delivering certain public goods that society expects of the electricity sector. Viewed in this light, ZECs are an attempt by state officials to

233. Mont. State Pub. Serv. Comm'n, *supra* note 201, at 3–4.
234. RTOs oversee transmission systems and oversee auctions in competitive electricity markets.

increase revenue for the plants deemed necessary to ensure the provision of the social benefits.

Floor prices arise in other market design contexts.[235] For example, the California Cap-and-Trade Program and the Regional Greenhouse Gas Initiative (RGGI) carbon market in the Northeast and Mid-Atlantic regions seek to incentivize investments in low-carbon infrastructure by increasing the cost of emitting greenhouse gases. Low allowance prices may fail to motivate investments in low-carbon infrastructure and thus undermine the public policy goals of such market design programs. The California and RGGI markets address this issue by establishing price floors for their allowance auctions.[236]

RTO capacity auctions also rely on floor prices to ensure that the economic signals are sufficient to ensure the future reliability of their respective grids.[237] The market floors for capacity auctions and carbon markets illustrate a key risk associated with low market prices—without a sufficient price to incentivize construction and maintenance of power plants, the grid may not be able to meet future demand. This point receives less attention in public debates than does the risk of high prices and may seem counterintuitive when the primary argument in favor of competitive markets is the potential for competition to result in lower prices.

The unanticipated economic vulnerability of nuclear power plants in competitive electricity markets and the subsequent efforts by states and the U.S. Department of Energy to provide

235. Floor prices are commonly used in auctions. *See, e.g.*, Steven L. Good & Celeste M. Hammond, *Real Estate Auctions—Legal Concerns for an Increasingly Preferred Method of Selling Real Property*, 40 REAL PROP. PROB. & TR. J. 765, 776–77 (2006) (describing the use of auction reserves in real estate auctions).

236. In the RGGI context, the focus is exclusively on electricity generation. *Elements of RGGI*, RGGI INC., http://www.rggi.org/design/overview (last visited Nov. 11, 2018) [https://perma.cc/EZ75-L58Y]. The California market covers additional sectors. CAL. AIR RES. BD., CAP-AND-TRADE INSTRUCTIONAL GUIDANCE, CHAPTER 2: IS MY COMPANY SUBJECT TO THE CAP-AND-TRADE REGULATION? 20–22 (2012), https://www.arb.ca.gov/cc/capandtrade/guidance/chapter2.pdf [https://perma.cc/BP54-CGNJ]. Carbon markets may seek to achieve other social goals as well, such as funding investments in innovative technologies or mitigating price impacts for certain populations, locations, or economic sectors. *See Carbon Market Cooperation*, ENVTL. DEF. FUND, https://www.edf.org/climate/carbon-market-cooperation (last visited Feb. 23, 2018) [https://perma.cc/V76F-QJCC].

237. *See, e.g.*, *Markets: Results of the Annual Forward Capacity Auctions*, ISO-NE, https://www.iso-ne.com/about/key-stats/markets (last visited Feb. 4, 2018) [https://perma.cc/SP69-GEER] (listing floor prices for annual forward capacity auctions).

additional payments to keep the plants operational point to a minimum price necessary to provide social goods. This is not to suggest that there is, or should be, a specified minimum price for electricity in competitive markets. It does, however, demonstrate the intersection between social goals and market dynamics. The ZEC programs and the economic shifts underlying the Trump administration's proposals expose the risk to competitive electricity markets if policymakers and grid operators fail to proactively address social and environmental concerns.

The remainder of this subsection outlines two alternate strategies for mitigating energy-related job losses and achieving long-term environmental protection goals: building on the precedent of competitive transition charges implemented during the initial state restructuring process and incorporating a carbon price directly into RTO auctions.

1. Addressing Employment Impacts of Retiring Power Plants

Job losses resulting from changes in competitive electricity markets represent a new wave of social costs resulting from restructuring. During the initial restructuring process, states made policy choices to ensure the continued provision of public goods resulting from an affordable and reliable electricity sector.[238] Local distribution companies (also referred to as load-serving entities or LSEs) inherited the utilities' duty to serve all customers within their respective service territories.[239] Some states implemented temporary limits on retail rates post-restructuring and established programs to assist low-income residents.[240] PUCs retained authority to oversee system reliability.[241]

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238. Rossi, *supra* note 39, at 1294–95.

239. *See id.*

240. *See* Barbara R. Alexander, *Managing Default Service to Provide Consumer Benefits in Restructured States: Avoiding Short-Term Price Volatility*, U.S. DEP'T HEALTH & HUM. SERVS. (June 2003), https://liheapch.acf.hhs.gov/pubs/defservintro.htm [https://perma.cc/4X9V-S2R9].

241. *See, e.g.*, Nat'l Ass'n of State Util. Consumer Advocates, Comment on Rules Concerning Certification of the Electric Reliability Organization; and Procedures for the Establishment, Approval and Enforcement of Electric Reliability Standards, Second Technical Conference, Docket No. RM05-30-000, at 6 (Dec. 9, 2005), http://www.ferc.gov/CalendarFiles/20051209103606-Popowsky,%20NASUCA.pdf [https://perma.cc/XG8N-TB6A] ("[E]ven in a restructured state such as Pennsylvania, it can be seen that the state General Assembly believed

The approach to stranded asset recovery is a particularly instructive model for addressing job losses. Requiring utilities to divest themselves of generation assets presented the risk that the firms and their investors would not recover the full value of investments once deemed prudently incurred by the state PUC.[242] Although many utilities would have had strong legal claims if states had denied recovery of any stranded costs, it is not clear that they would have recovered the full value of the undepreciated power plants.[243]

As Steve Isser notes, stranded asset recovery was a political response as well as a legal one.

> Utility consultants tried to portray the issue as one of economic efficiency and legal rights rather than as a political question of how to distribute the cost of a socially desirable transition in market structure. Ostensibly, the recovery of stranded costs reflected states accepting their obligations under the "regulatory compact," in lieu of being forced to honor their agreements by the courts.[244]

Rather than fight the issue in courts, states implemented competitive transition charges (CTCs) to allow recovery of the stranded costs through retail rates collected by the local distribution companies.[245] Recoverable stranded costs included "reg-

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that the state PUC would continue to exercise its authority to maintain the reliability of all facets of electricity service."). RTOs, FERC, and the National Electricity Reliability Council play important roles in ensuring system reliability. *See* U.S. DEP'T OF ENERGY, ENSURING ELECTRICITY SYSTEM RELIABILITY, SECURITY, AND RESILIENCE 4-4 (2017), https://energy.gov/sites/prod/files/2017/02/f34/Chapter%20IV—Ensuring%20Electricity%20System%20Reliability%2C%20Security%2C%20and%20Resilience.pdf [https://perma/cc/42LX-PBNK].

242. *See* Portland Gen. Elec. Co., Oregon Pub. Util. Comm'n Order No. 95-322 (1995).

243. *See* William J. Baumol & J. Gregory Sidak, *Stranded Cost Recovery: Fair and Reasonable*, FORTNIGHTLY MAG. (May 15, 1995), https://www.fortnightly.com/fortnightly/1995/05-0/stranded-cost-recovery-fair-and-reasonable [https://perma.cc/SQU6-XA2H].

244. ISSER, *supra* note 20, at 201. Social outcomes included protecting investors, including pension funds.

245. *See, e.g.*, Walter R. Hall II, *Securitization and Stranded Cost Recovery*, 25 ENERGY L.J. 173, 191–92 (2004) (describing Pennsylvania's competitive transition charge); Scott B. Finlinson, *The Pains of Extinction: Stranded Costs in the Deregulation of the Utah Electric Industry*, 1998 UTAH L. REV. 173, 205 (describing California's competitive transition charge); Alan Miller & Adam Serchuk, *The Promise and Peril in a Restructured Electric System*, 12 NAT.

ulatory assets, the diminished value of generating plant assets, above-market purchase power contracts and costs required to renegotiate or buy out certain contracts."[246]

Job losses and impacts on local economies are another social cost of restructuring, and states could utilize the CTC model to provide job retraining, funds for economic development, pension funding, and other societal needs in the aftermath of plant closings.[247] In some locations, retiring plants are the largest employers.[248] Electricity-sector job losses may also extend throughout the supply chain, impacting rail companies that transport coal and communities dependent upon coal mining.[249] Coal mining communities in the Appalachian states, for example, suffer from some of the worst poverty rates in the country.[250] Funding for job retraining and economic development in those areas could not only contribute to local economies but also produce the social benefits associated with poverty alleviation.[251]

An employment-focused Energy Transition Charge would also address an important political challenge presented by competitive electricity markets. Leaving decisions regarding plant closure to market forces rather than PUC rate setting exposes employees at power plants, as well as employees throughout the power plants' fuel supply chain, to job loss in the event of

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RESOURCES & ENV'T 118, 149 (1997) (describing California's competitive transition charge).

246. Tom Lumsden et al., *Electric Utility Deregulation Creates Winners & Losers What's the Effect on Utilities' Financial Statements*, 1999 AM. BANKR. INST. J. 26, 26.

247. Other closely related models are also available, such as the system benefits charge that some states implemented to "fund public policy initiatives not expected to be adequately addressed by . . . competitive electricity markets." *System Benefits Charge*, N.Y. STATE DEP'T PUB. SERV., http://www3.dps.ny.gov/W/PSCWeb.nsf/All/58290EDB9AE5A89085257687006F38D1 (last updated June 3, 2014) [https://perma.cc/34ZM-QCCK].

248. *See* Tom Henry, *FirstEnergy Executive: Davis-Besse Plant Headed for Premature Closure*, BLADE (Jan. 26, 2018), http://www.toledoblade.com/business/2018/01/25/FirstEnergy-executive-Davis-Besse-plant-headed-for-premature-closure.html [https://perma.cc/5QWP-93M4].

249. Haerer & Pratson, *supra* note 123, at 90.

250. *See* Andria Caruthers, *Mapping Poverty in the Appalachian Region*, CMTY. COMMONS (Aug. 9, 2016), https://www.communitycommons.org/2016/08/mapping-poverty-in-the-appalachian-region [https://perma.cc/6XV3-E7NY].

251. *See* Parija Kavilanz, *How This Kentucky Coal Town Is Trying to Bring Its Economy Back to Life*, CNN MONEY (Nov. 8, 2017, 8:05 AM), http://money.cnn.com/2017/11/08/news/economy/hazard-kentucky-coal-jobs/index.html [https://perma.cc/5ADE-Q5QD].

changing market forces.[252] The Department of Energy's Proposed Grid Resiliency Pricing Rule and "War on Coal" rhetoric during the Obama Administration and 2016 election shine a bright light on the economic, political, and environmental impacts of ignoring job losses resulting from rapid shifts in the electricity sector.[253]

2. Meeting State Environmental Protection Goals

ZEC programs demonstrate the central role of environmental protection in electricity markets.[254] State energy and environmental mandates operating in parallel with electricity markets is nothing new. Even as states moved to restructure their electricity markets, they were also implementing renewable portfolio and energy efficiency standards to promote clean energy technologies.[255] The California Cap-and-Trade Program and the Regional Greenhouse Gas Initiative impose carbon prices on electricity generators, impacting their relative competitiveness in electricity markets.[256] These market-based strategies complement other state and federal environmental regulations.[257]

If the courts uphold the ZEC program design and market prices continue to fall below the level necessary to maintain (or incentivize construction of) facilities necessary to meet ZEC program goals, states may increasingly turn to price supports to correct what they perceive as market gaps. If the courts ul-

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252. *See* M. Scott Niederjohn, *Regulatory Reform and Labor Outcomes in the U.S. Electricity Sector*, 126 MONTHLY LAB. REV. 10, 14–18 (May 2003); *see also* Russell Gold, *At Modern Utilities, Jobs Go Up in Smoke*, WALL ST. J., Jan. 16, 2018, at B1.

253. *See, e.g.*, Gavin Bade, *Trump Touts End of 'War on Beautiful, Clean Coal' in State of the Union*, UTIL. DIVE (Jan. 31, 2018), https://www.utilitydive.com/news/trump-touts-end-of-war-on-beautiful-clean-coal-in-state-of-the-union/516000 [https://perma.cc/WMR6-FASR]; Michael Grunwald, *Inside the War on Coal*, POLITICO (May 26, 2015), https://www.politico.com/agenda/story/2015/05/inside-war-on-coal-000002 [https://perma.cc/CUD6-7HNH] ("The industry and its supporters use 'war on coal' as shorthand for a ferocious assault by a hostile [Obama] White House.").

254. *See, e.g.*, N.Y. Clean Energy Standard Order, *supra* note 83, at 2.

255. Ryan Wiser et al., *Assessing the Costs and Benefits of US Renewable Portfolio Standards*, 12 ENVTL. RES. LETTERS 1, 2 (2017).

256. *California Air Board Approves Controversial Greenhouse Gas Cap-and-Trade Rules*, MARTEN LAW (Nov. 2, 2011), http://www.martenlaw.com/newsletter/20111102-calif-ghg-cap-and-trade-rules [https://perma.cc/U2UG-8RFZ].

257. *Id.*

timately overturn ZEC requirements, these same states may pursue their environmental and energy policies via other measures that are less directly linked to RTO market prices.[258]

The Federal Power Act's "just and reasonable" standard provides FERC sufficient discretion to allow RTO markets to incorporate a carbon price into their rate setting mechanisms.[259] Energy markets already reflect compliance costs for existing environmental regulations. Neglecting to anticipate changes in environmental policy has direct impacts on the cost of electricity.[260] Furthermore, RTOs and utilities already include carbon prices in their long-term planning, reinforcing the view that mitigating the risk of future environmental regulations is an important component of electricity-sector management.[261]

While states may conclude that subsidizing certain uncompetitive existing facilities is necessary to achieve climate policy goals, this strategy is less efficient than a broad market signal incentivizing low carbon investments. New York's ZEC program is based on the Obama administration's assessment of the social cost of carbon.[262] Although ZECs act as a type of carbon price, they function differently than a carbon market such as RGGI. ZECs focus on maintaining viability for a small number of specific facilities.[263] In the case of New York, only three facilities will receive ZEC price supports.[264] Carbon pricing via sector-wide cap-and-trade programs or carbon taxes creates incentives for a much broader group of market participants to

258. Hughes v. Talen Energy Mktg., LLC, 136 S. Ct. 1288, 1299 (2016) (noting state options to promote electricity policy goals).

259. Peskoe, *supra* note 40, at 12–15; STEVEN WEISSMAN & ROMANY WEBB, BERKELEY CTR. FOR L. ENERGY AND ENV'T & BERKELEY ENERGY AND CLIMATE INST., ADDRESSING CLIMATE CHANGE WITHOUT LEGISLATION, VOL. 2: FERC 10–13 (2014).

260. Jonas Monast & David Hoppock, *Designing CO2 Performance Standards for a Transitioning Electricity Sector: A Multi-Benefits Framework*, 44 ENVT'L L. REP. 11068, 11073 (2014); Peskoe, *supra* note 40.

261. JIM LAZAR & DAVID FARNSWORTH, REG. ASSISTANCE PROJECT, INCORPORATING ENVIRONMENTAL COSTS IN ELECTRIC RATES 35 (Oct. 2011), https://www.raponline.org/wp-content/uploads/2016/05/rap-lazarfarnsworth-incorporatingenvironmentalcostsinelectricrates-2011-10.pdf [https://perma.cc/NLL2-QTHH].

262. Shelley Welton, *Electricity Markets and the Social Project of Decarbonization*, 118 COLUM. L. REV. 1067, 1087 (2018).

263. *See* N.Y. Clean Energy Standard Order, *supra* note 83, at 156–57.

264. *Id.*

move away from higher-emitting generation and incentivizes investments in lower-emitting options.[265]

Proactively addressing environmental goals could also help states mitigate other impacts of the rapid electricity-sector transformation. Providing long-term signals regarding emission limits, for example, may allow electric power companies to focus investments on lower-emitting generation options. This, in turn, allows for a more deliberate transition away from higher-emitting resources, thus providing more certainty regarding energy jobs and allowing states to take measures to assist with retraining and economic development efforts.

Strategies to address the environmental impacts of the electricity system may vary. In addition to environmental markets or compensation for desirable environmental attributes (e.g., ZECs), policymakers can implement complementary measures such as renewable portfolio standards or traditional environmental regulations pursuant to federal and state environmental protection statutes. The important takeaway is that the failure to ensure environmental protection may undermine the economic and political stability of electricity markets.[266]

D. *Opportunities to Modernize Utilities via Market Competition*

The final lesson regarding electricity-sector competition focuses specifically on states with traditionally regulated utilities. Despite the potential for PUCs to more directly manage fluctuations in fuel prices and new technology options, policymakers in these states are grappling with some of the same challenges as policymakers in restructured states. Low natural gas prices are also causing vertically integrated monopolies to shutter coal-fired power plants, and they raise questions regarding the future viability of existing nuclear power plants. Incorporating an energy transition charge could help states fund economic development efforts, provide job retraining, bolster pensions, and provide social services for employees and communities affected by plant closures. Similarly, forward-thinking environmental policies could provide greater certainty

265. *See* Gilbert E. Metcalf, *Designing a Carbon Tax to Reduce U.S. Greenhouse Gas Emissions*, 3 REV. ENVTL. ECON. & POL'Y 63, 68–74 (2009).
266. *See* Spence, *supra* note 121, at 986–89.

so utilities and PUCs could manage capital investments and plant closures in a manner that better avoids rapid plant closures and at least partially mitigates stranded asset concerns.[267]

Policymakers in traditionally regulated states also have an opportunity to foster new approaches to generate investments, risk analysis, and consumer choice by increasing opportunities for third parties to compete with monopoly utilities. In this sense, the threat of market competition may provide a set of external threats that motivate the utility to innovate in terms of technologies, grid management, and customer services.[268] This subsection introduces two such strategies. The first describes options for utilizing competitive procurement to achieve public policy goals. The second explores options for inducing utilities to pursue new business strategies by increasing the risk of market competition.

1. Implementing Public Policy Goals via Competitive Procurement

Competitive procurement is contributing to falling renewable energy costs around the globe and could play a broader role in U.S. states that utilize the cost-of-service model for

267. *See, e.g.,* David Hoppock et al., *Benefits of Early State Action in Environmental Regulation of Electric Utilities: North Carolina's Clean Smokestacks Act* (Nicholas Instit. for Envtl. Pol'y Solutions, Duke University, Working Paper No. 12-05, July 2012), https://nicholasinstitute.duke.edu/climate/policydesign/benefits-of-early-state-action-in-environmental-regulation-of-electric-utilities [https://perma.cc/CBZ3-PXPV] (analyzing the impact of North Carolina's Clean Smokestacks Act on the cost of complying with Obama-era Clean Air Act rules).

268. This discussion borrows from scholarship on induced innovation that explores how private firms react, or innovate, in response to exogenous factors (factors outside the direct control of the firm) that impact the firms' competitiveness. Michael E. Porter & Claas van der Linde, *Toward a New Conception of the Environment-Competitiveness Relationship*, 9 J. ECON. PERSPS. 97, 99–100 (1995) (developing what has become known as the "Porter hypothesis"). The definition of innovation offered by these scholars tends to be value neutral, considering whether a change occurred, not whether the change satisfied specific normative criteria to demonstrate that the development was desirable. Richard G. Newell et al., *The Induced Innovation Hypothesis and Energy-Saving Technological Change*, 114 Q.J. ECON. 941, 944 (defining innovation "as the introduction of a product model with a bundle of characteristics that was not previously available, *or* the production of a previously available bundle of characteristics at a cost that is lower than was previously feasible").

setting electricity rates.[269] In traditionally regulated states, expanded use of competitive procurement programs could correct some of the deficiencies of the cost-of-service model. A consistent critique of the monopoly public utility model is the disincentive for investments in renewable energy and energy efficiency. Competitive procurement is already contributing to falling renewable energy costs around the globe and could play a broader role in traditionally regulated states.[270]

North Carolina's new renewable energy legislation (HB 589) provides a useful model. Stripping the competitive bidding provisions in HB 589 down to their core elements, the law sets a target (i.e., an additional 2.6 GW of solar capacity within forty-five months), establishes a competitive process to achieve its public policy goal, allows third parties to compete with the utility to achieve the target, allows the utility or its nonregulated subsidiaries to earn revenue if their bids are accepted, and ensures the utility does not exercise undue market power.[271] Together, these provisions ensure that the public policy goal will be met and allow ratepayers to benefit if independent (i.e., non-utility) companies can meet the goal at a lower cost than the utility. Traditionally regulated states could use similar processes to allow competitive bidding for efficiency projects, energy storage, and demand response.

States could also utilize the HB 589 model to achieve other societal benefits without increasing risk for ratepayers. For example, charging stations for electric vehicles present a complicated chicken-and-egg problem for PUCs. Commissioners may be reluctant to approve capital investments and approve rate recovery, including the rate of return, if charging stations are

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269. INT'L RENEWABLE ENERGY AGENCY, RENEWABLE POWER GENERATION COSTS IN 2017: KEY FINDINGS AND EXECUTIVE SUMMARY 2 (2017), http://irena.org/-/media/Files/IRENA/Agency/Publication/2018/Jan/IRENA_2017_Power_Costs_2018_summary.pdf?la=en&hash=6A74B8D3F7931DEF00AB88BD3B339CAE180D11C3 [https://perma.cc/3HTP-7WTY].

270. *Id.* at 5.

271. H.B. 589, 2017 Gen. Assemb., N.C. Sess. Laws 192 (N.C. 2017); *Monitoring Analytics Is the Independent Market Monitor for PJM Interconnection*, MONITORING ANALYTICS, http://www.monitoringanalytics.com/company/about.shtml (last visited Nov. 29, 2018) [https://perma.cc/CP7Q-XX5T] (noting that the company's role as independent market monitor includes "monitor[ing] the potential of market participants to exercise undue market power, the behavior of market participants that is consistent with attempts to exercise market power and the market performance that results from the interaction of market structure with participant behavior").

underutilized.[272] Competitive bidding, combined with the ability for prices to fluctuate, could mitigate the concern. The law could allow firms that successfully bid on a charging station project to engage in retail sales and to procure electricity from whichever generators they choose. Companies bidding would bear the risk if the facilities are not used. Similar to HB 589, state legislative reform could permit unregulated companies affiliated with the monopoly to compete. This approach would create opportunities for companies to develop the infrastructure that will be necessary for electric vehicles to gain market share without placing risk on ratepayers. The competitive bidding approach thus removes barriers and is agnostic regarding who provides the service.

Strategically increasing competition would not address the challenges regarding costs for the cancelled South Carolina nuclear units, but it could help avoid future stranded asset risks by utilizing market forces to vet the viability of new generation projects rather than relying primarily on utility projections of future needs and costs. Expanding opportunities for competition could create circumstances to take advantage of emerging technologies such as battery storage, as well as increased penetration of renewable energy, to induce monopoly utilities to consider additional options for meeting, or reducing, electricity demand.

2. Utilizing the Risk of Competition to Spur New Utility Strategies

Policymakers in traditionally regulated states may also utilize the prospect of competition to spur regulated monopolies to develop new strategies to respond to changing market conditions. Both Nevada examples described above fit the mold. The credible risk that additional large consumers could secure their own low-cost renewable energy contracts or that a majority of voters will choose to restructure the state's electricity sector could provide powerful motivation for utility executives to consider alternate investments and customer options.

Net metering—a state-based mechanism with its roots in PURPA and state renewable energy goals—is another example of state policy allowing consumers to exert greater influence

272. Shelley Welton, *Clean Electrification*, 88 U. COLO. L. REV. 571, 603 (2017).

over the direction of the electricity sector.[273] These state programs require utilities to compensate residential and commercial customers for renewable energy generation that is sold onto the electricity grid, and thus provide limited opportunities for retail and commercial customers to sell electricity to local utilities or grid operators. Net metering has been a subject of debate and criticism in recent years.[274] Many of these state programs, which generally compensate the residential and commercial customers at the full retail electricity rate, have been in place for decades.[275] The policies are receiving attention now because the cost of solar panels has fallen to a point where more consumers are now taking advantage of net metering opportunities.[276]

The growing number of consumers benefiting from net metering policies, and utilities' recognition of the potential threat that rooftop solar compensation programs can present to future utility revenues, suggests that net metering is serving as an external factor that induces utilities to adjust their business practices.[277] In that sense, it is functioning as a type of innovation policy that allows energy consumers to influence decisions at the utility. Viewed in this light, the debate over cost turns on more than just the fairness of compensating residential and commercial providers of renewable electricity at a rate that incorporates both the cost of generating and transporting

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273. *See* Mark James et al., *Planning for the Sun to Come Up: How Nevada and California Explain the Future of Net Metering*, 8 SAN DIEGO J. CLIMATE & ENERGY 1, 2–8 (2017).

274. For a description of net metering, see Steven Ferrey, *Net Legal Power*, 53 SAN DIEGO L. REV. 221, 227–30 (2016); *see also* Richard L. Revesz & Burcin Unel, *Managing the Future of the Electricity Grid: Distributed Generation and Net Metering*, 41 HARV. ENVTL. L. REV. 43, 71–77 (2017) (analyzing shortcomings of net metering).

275. *See State Net Metering Policies*, NAT'L CONF. STATE LEGISLATURES (Nov. 20, 2017), http://www.ncsl.org/research/energy/net-metering-policy-overview-and-state-legislative-updates [https://perma.cc/6YXK-L8XP].

276. *See, e.g.*, Troy A. Rule, *Solar Energy, Utilities, and Fairness*, 6 SAN DIEGO J. CLIMATE & ENERGY L. 115, 118–19 (2015) ("As rooftop solar development becomes more commonplace, it is likely to dampen demand for grid-supplied power and thereby cut into utilities' profits."); Michael Wara, *Competition at the Grid Edge: Innovation and Antitrust Law in the Electricity Sector*, 25 N.Y.U. ENVTL. L.J. 176, 189 (2017) ("To date, the most common response by utilities to the disruptive challenge presented by distributed solar has been to propose changes to retail rate structures that act to reduce solar power's cost advantage over grid-supplied energy.").

277. *See* Rule, *supra* note 276, at 118–25 (summarizing utility efforts to lobby for changes to state net metering policies).

energy, as opposed to simply compensating at the rate offered for generation.

While more customers are taking advantage of net metering, these customers represent a small fraction of most utilities' total number of ratepayers.[278] The actual cost that net metering is currently imposing on most electricity consumers is therefore low.[279] If concerns about the prospect of increased participation by retail and commercial consumers cause utilities to develop cost-effective strategies to respond to consumer demand for renewable energy, net metering could provide an efficient policy mechanism to motivate utilities to pursue, and PUCs to approve, new programs that provide societal benefits while maintaining affordable and reliable power.

Society may be willing to pay more for innovative technologies, or use of those technologies, if they offer societal benefits. In this instance, assessments of the merits of net metering should consider the ability for consumers to exert greater influence over the direction of the electricity sector and ensure that values beyond affordability are taken into consideration.[280] At the moment, few customers are taking advantage of net metering policies.[281]

Other state programs may also create external forces that push incumbent utilities to change behavior. Like net metering programs, third-party leasing for residential and commercial installations of solar energy removes financial barriers to renewable energy. These programs also allow independent (i.e., non-utility) companies a limited ability to sell electricity to retail consumers.[282] Allowing third parties to access smart

278. U.S. ENERGY INFO. ADMIN., SHORT-TERM ENERGY OUTLOOK SUPPLEMENT: EXPANDED FORECASTS FOR RENEWABLE ENERGY CAPACITY AND GENERATION (July 2017), https://www.eia.gov/outlooks/steo/special/supplements/2017/2017_sp_02.pdf [https://perma.cc/Y78S-UDXF].

279. *See* Mark Muro & Devashree Saha, *Rooftop Solar: Net Metering Is a Net Benefit*, BROOKINGS (May 23, 2016), https://www.brookings.edu/research/rooftop-solar-net-metering-is-a-net-benefit/ [https://perma.cc/JC65-5EKK].

280. Welton, *supra* note 262, at 1096 (noting that electricity sector "choices and values . . . extend far beyond what technologies are available at what costs").

281. Uma Outka, *Fairness in the Low-Carbon Shift: Learning from Environmental Justice*, 82 BROOK. L. REV. 789, 806–07 (2017).

282. *See, e.g.*, Solar Power Free-Market Financing Act of 2015, GA. CODE ANN. § 46-3-65 (2018).

meter data could also allow companies to develop new services, inducing utilities to do the same.[283]

CONCLUSION

Competition necessarily creates winners and losers. Early responses to the disruptions created by sustained low natural gas prices rely on subsidizing facilities that find themselves unable to compete.[284] Policymakers may determine that subsidies are necessary in the short term, but longer-term solutions are necessary to mitigate local economic impacts of shutting down plants and moving to new forms of generation and conservation.

Recent history and different state regulatory models allow a nuanced, critical view of the role of market competition and the implications of facilitating and restricting competition. This article identifies four overarching lessons that should inform federal and state officials as they reconsider the merits of electricity-sector competition and the market design elements necessary to ensure that competition achieves, or does not undermine, societal goals. Most importantly, value choices remain central to electricity-sector governance.

In the absence of proactive measures to achieve social goals while the sector evolves, reactive measures will likely continue. These measures could impact the sector as a whole and frustrate, rather than facilitate, achieving long-term social goals. For example, decarbonization will be expensive and changing market rules may result in inefficient investments and underutilized assets. Companies that have made recent investments in new, efficient natural gas combined-cycle turbines—the type of investment that is causing economic pressure for nuclear plants in competitive states—may have less market share than they would in the absence of nuclear subsidies. Furthermore, the rapidly falling prices for energy storage could allow renewable energy to play a significant role in replacing generation in the event large nuclear or coal plants

283. For example, the Arkansas PSC is considering granting third parties access to data from advanced metering infrastructure. In the Matter of an Investigation of Policies Related to Distributed Energy Resources, Docket No. 16-028-U, Order No. 5, Nov. 9, 2017, http://www.apscservices.info/pdf/16/16-028-U_97_1.pdf [https://perma.cc/R5KU-T2CG].

284. *See* Dlouhy, *supra* note 87.

retire. Without the opening created by retiring plants, there may be fewer opportunities for storage projects than there otherwise would be.

Electricity market vacillations will continue as coal plants continue to retire, battery storage becomes viable, the transportation sector begins to electrify, and society continues to demand that the electricity sector decarbonize. State and federal policymakers can take proactive steps to realize the benefits of competition and manage the potential downsides in restructured and traditionally regulated markets.