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INTRODUCTION

Wholesale power markets currently face challenges from changes in federal regulations and advancements in technology, which have significantly changed the composition of energy generation sources across the United States over the last two decades.[1] States have relied increasingly on policy to increase the presence of clean energy sources in their power mix, such as nuclear energy, due to its reliability and environmental benefits.[2] Natural gas, wind, and solar have seen unprecedented growth in the last five years due to declining fuel source and technology costs.[3] Utilities companies and private companies have invested significantly in infrastructure and technology research, attempting to find success in the ever-changing wholesale power markets.

Nuclear power has struggled to become economically competitive as a source of energy for electricity generation in the United States. The federal government has provided substantial subsidies for renewable energy, while subsidies for coal and nuclear have declined.[4] Additionally, with the recent

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1. Paul Hibbard et al., *Electricity Markets, Reliability and the Evolving U.S. Power System*, at 6, Analysis Group (June 2017), http://www.analysisgroup.com/uploadedfiles/content/insights/publishing/ag_markets_reliability_final_june_2017.pdf.

2. *See* Gavin Bade, 10 trends shaping the electric utility industry in 2017, UTILITYDIVE (Jan. 23, 2017), https://www.utilitydive.com/news/10-trends-shaping-the-electric-utility-industry-in-2017/434541/ [https://perma.cc/BY6G-8LC8].

3. *Id.*

4. *See* Rep. Lamar Smith, *Tax Subsidies For Renewables Now Far Outpaces Fossil Fuels*, Real Clear Energy (Apr. 28, 2017), http://www.realclearenergy.org/articles/2017/04/28/tax_subsidies_for_renewables_now_far_outpaces_fossil_fuels_110217.html [https://perma.cc/PY2J-X7HY].

natural gas boom and influx of renewable energy sources, the price of electricity has dropped, resulting in lower profit margins and increased competition.[5] New developments in technology and regulations have raised legal questions about the Federal Power Act (FPA) that have not been answered by the courts or federal agencies. The FPA, adopted in 1935, leaves ambiguity about the regulation of intricate components of the energy system and the roles of states and regional commissions in encouraging competition and ensuring environmental benefits.

New York and Illinois, states that were home to early growth in the electricity sector, have recently challenged the boundaries of state authority over energy markets and drafted legislation to protect in-state nuclear energy generation by providing payments in the form of zero emission credits (ZECs).[6] Energy market participants and administrators claim that these subsidies have potential to impact regional energy markets and private investment permanently over the long-term, activities over which the Federal Energy Regulatory Commission (FERC) arguably retains authority. However, federal district courts in both New York and Illinois have recently upheld state programs intended to incentivize carbon-free electricity generation sources to participate in federally-regulated power markets.[7]

Part I of this Note will provide background on federal and state regulation of the energy industry, focusing on key pieces of federal legislation, FERC orders, and technological advancements in the energy sector.

Part II will provide an overview of the nuclear energy industry and the wholesale power markets in which New York and Illinois operate. Part II will also provide an overview of the state programs intended to incentivize nuclear power.

Part III will discuss FERC authority over wholesale power markets, U.S. Supreme Court precedent, and recent case law regarding the New York and Illinois nuclear subsidy programs. Part III will also discuss recent proposals addressing potential market distortions from these programs and conclude that successful integration of federal and state goals in regulating energy markets requires careful coordination and implementation.

5. *See* Robbie Orvis, *The state of US wholesale power markets: Is reliability at risk from low prices?*, UTILITYDIVE (May 22, 2017), https://www.utilitydive.com/news/the-state-of-us-wholesale-power-markets-is-reliability-at-risk-from-low-pr/443273/ [https://perma.cc/P99G-XBR7].

6. *See infra* note 126; *see also infra* note 146.

7. *Id.*

I. FEDERAL REGULATION OF THE ENERGY INDUSTRY AND WHOLESALE POWER MARKETS

A. THE GROWTH OF THE ELECTRIC UTILITY INDUSTRY AND REGULATION

The electric utility industry began to form in the late nineteenth century when Thomas Edison established a utility business in New York City's financial district in 1882, consisting "of steam engines, generators, and a wiring network designed to illuminate electric lights in restaurants and shops."[8] With the invention of alternating current in the 1880s, which could overcome physical limits of "long-distance transmission and distribution of power," utility companies were able to grow "into giant, centralized electric power corporations–corporations that quickly became classed with railroad companies as both public necessities and public demons."[9]

It was not long before there were opportunities in the electricity sector for capitalizing on investments in technology risk. With the invention of the steam turbine in 1884 in England, Samuel Insull, secretary to Edison for eleven years, became president of Chicago Edison Company in 1892 and quickly gained advantage over rival Chicago power companies.[10] Using cost-effective turbine generators at 5000-kilowatt (kW) capacity, Insull grew his customer base, bought rival firms, and employed various business practices to dominate the market.[11] This consolidation of market power was contrary to the first visions of the electricity market as a freely operating exchange of competitive firms that were expected to "ensure good service and reasonable prices."[12] Among other issues, market power intertwined with local politics soon led to corruption and adoption of other models such as municipalization, in which city governments owned and operated electric utility assets.[13] Indeed, by the 1930s, "[p]ower companies remained the only source of political support. Regulators [at the state level] therefore did little to offend their masters."[14] In the absence of federal regulation over utility operations and transfers of electricity, state commissions were often composed of incompetent professionals

8. RICHARD F. HIRSH, POWER LOSS: THE ORIGINS OF DEREGULATION AND RESTRUCTURING IN THE AMERICAN ELECTRIC UTILITY SYSTEM 12 (The MIT Press, 1999); *see also id*. at 13 (General Electric Company was formed in 1892).

9. Hirsh, *supra* note 8, at 13.

10. *Id.*

11. *Id*. at 1314 ("After installing a 5-MW unit in 1905, Insull's Commonwealth Edison purchased 12-MW machines in 1911"); *id*. at 46.

12. *Id*. at 14.

13. *Id*. at 14 ("Insull, for example, regularly dealt with dishonest Chicago politicians who tried to extort huge payments in return for maintaining his monopoly.").

14. *Id*. at 45.

"interested in obtaining a steady job for at least the next six years."[15]

Regulations soon formed to oversee utility operations, since the rise of holding companies and the inherent monopolistic nature of the electrical system resulted in consolidated market power over customer bases.[16] Utilities controlled the transmission and distribution systems in each market and provided services at costs far below that of competitors, which prevented other utilities from entering and providing electricity service to their customers.[17] This control over customer bases and ability to collect increasing revenues arguably allowed utility companies to attract the capital necessary to match the growing infrastructure needs in the sector, since the cost of utility construction rose from $500 million in 1902 to more than $2 billion in 1912.[18] The theory of natural monopoly that allowed such growth held that monopolistic utilities avoided duplicate construction and operation of electricity service infrastructure such as transmission lines and distribution facilities, which "contributed to society's welfare" since it reduced resource waste.[19] With the passage of the Public Utility Holding Company Act (PUHCA) in 1935, regulations impacting market power and investment in the electric industry began to take form, attempting to break apart large utility companies engaging in anti-competitive practices and heavy advertising campaigns aimed at maintaining their monopoly status.[20]

The Federal Power Act (FPA), adopted in 1935, was intended to address the regulatory gap (known as the "Attleboro Gap") in the regulation of interstate electricity transfers, authority not held by the states.[21] Congress established FERC and gave it authority over the increased transfers of interstate electricity services occurring in the early twentieth century.[22]

15. *Id*. at 43.

16. Everest Schmidt, *A Call for Federalism: The Role of State Government in Federally Controlled Energy Markets*, 65 RUTGERS L. REV. 573, 578 (2016).

17. *Id*. at 576 n.11 (discussing a natural monopoly in the context of electricity utilities).

18. *See* Hirsh, *supra* note 8, at 34 ("Already in 1910, the industry had become among the most capital intensive in the country, requiring five dollars of investment to earn one dollar in annual income").

19. Hirsh, *supra* note 8, at 124.

20. *Id*. at 40 ("The [Federal Trade] Commission reported in 1934 that utility advertising campaigns, costing as much as $30 million per year, were second in magnitude only to government propaganda efforts during wartime").

21. *See* Pub. Utils. Comm'n v. Attleboro Steam & Elec. Co., 273 U.S. 83, 89 (1927) (holding that states cannot regulate interstate electricity transfer since it is an "imposition of a direct burden upon interstate commerce, from which the state is restrained by the force of the commerce clause"); *see also* United States v. Pub. Utils. Comm'n, 345 U.S. 295, 308 (1953) (holding that the Federal Power Act "was intended to 'fill the gap' . . . left by Attleboro in utility regulation.").

22. William Boyd & Ann E. Carlson, *Accidents of Federalism: Ratemaking and Policy Innovation in Public Utility Law*, 63 UCLA L. REV. 810, 822 (2016).

Section 201 of the FPA provides that the federal government has authority over "that part of such business which consists of the transmission of electric energy in interstate commerce and the sale of such energy at wholesale in interstate commerce," and its power will "extend only to those matters which are not subject to regulation by the States."[23] This section explicitly grants states jurisdiction over "facilities used for the generation of electric energy," such as nuclear energy facilities and natural gas-fired power plants.[24] Section 205 of the FPA states that "[a]ll rates and charges made . . . by any public utility for or in connection with the transmission or sale of electric energy subject to the jurisdiction of the Commission, and all rules and regulations affecting or pertaining to such rates or charges shall be just and reasonable . . . ."[25] Lastly, Section 206 allows the Commission to intervene and remedy rates or regulations that it finds to be "unjust, unreasonable, unduly discriminatory or preferential . . . ."[26] Arguably, "one of the intentions of the FPA was to draw a bright line distinguishing state and federal jurisdiction."[27] However, as this discussion of state nuclear energy subsidies will show, defining a bright line can be difficult and troubling for both state and federal regulators accomplishing conflicting goals.

Until the 1980s, FERC regulated the wholesale electricity markets by reviewing negotiated contracts "based on cost-of-service" principles.[28] Following the conclusion of World War II, electric utility companies enjoyed the advantages of vertical integration of their firms, successfully exploiting the "grow-and-build strategy" to meet the constant growth that occurred for most of the middle-twentieth century.[29] Vertically-integrated utilities, "owning generation, transmission, and distribution infrastructure . . . rarely needed to purchase wholesale electricity," leaving few opportunities for federal intervention in wholesale energy transactions.[30]

23. Federal Power Act of 1935 § 201, 16 U.S.C. § 824(a) (2015).

24. Federal Power Act of 1935 16 U.S.C. § 824(b).

25. 16 U.S.C. § 824(d).

26. 16 U.S.C. §824(e).

27. *See* Schmidt, *supra* note 16, at 583.

28. Ari Peskoe, *Integrating Markets and Public Policy in New England Wholesale Electricity Markets: Legal Analysis*, Harvard Law School, Discussion Draft, at 5, (Oct. 27, 2016), http://environment.law.harvard.edu/wp-content/uploads/2016/10/IMAPP-Memo-Harvard-Environmental-Policy-Initiative-10-27-16.pdf [https://perma.cc/F4LP-Q5E5] (rather than filing approval for contracts based on costs, sellers requested the ability to sell energy at market-based rates).

29. *See* Hirsh, *supra* note 8, at 55; *see also* Schmidt, *supra* note 16, at 583.

30. Giovanni S. Saarman Gonzalez, *Evolving Jurisdiction Under the Federal Power Act: Promoting Clean Energy Policy*, 63 UCLA L. REV. 1422, 1432 (2016).

B. THE RISE OF REGULATIONS ENCOURAGING COMPETITION AND REGIONAL COOPERATION

During the 1970s, advancements in energy technologies began reaching barriers in operational efficiency improvements during a time of political turmoil that separately resulted in oil and gas shortages, ultimately called "the Energy Crisis" of the 1970s.[31] It "highlighted the wasteful ways by which Americans produced and consumed energy . . . caused major shifts in customers' behavior and spurred legislation that altered the way utilities did business."[32] Indeed, "these developments resulted in much greater scrutiny and criticism of the traditional approach to regulating utilities and setting electricity rates."[33] The series of federal legislative enactments and FERC Orders following the Energy Crisis were aimed largely at promoting competition in wholesale electricity markets to encourage energy efficiency, innovation, and technological advancement, while introducing considerations of environmental impacts from economic activities.

One of the most important pieces of legislation impacting energy markets, the Public Utilities Regulatory Policies Act (PURPA), notably Section 210, was passed in 1978.[34] Addressing energy efficiency at the energy generation source, PURPA intended to incentivize more efficient electricity generation through unconventional sources, including cogeneration technology.[35] In a challenge to the traditional, vertically-integrated utility which controlled much of its energy generation supply for most of the twentieth century, "[c]ogenerator entrepreneurs . . . employed modular, small-scale technology (such as gas turbines)," and in the 1990s, "they found they could beat utility costs by a margin of 5 to 15 percent."[36] In converting fuel to electricity, technology such as combined-cycle cogeneration was able to achieve an efficiency of 50 percent or better, well above the range of traditional utility power plants at 35 percent to 40 percent.[37] Cogenerators and other independent power producers were able to provide electricity at lower costs by developing smaller-scale power plants that operated with more efficient and cost-effective technology as compared to larger, traditional utility power plants that were providing most of the electricity generation prior to PURPA.[38]

31. *See* Hirsh, *supra* note 8, at 59.
32. *Id*. at 58.
33. *See* Boyd & Carlson, *supra* note 22, at 830.
34. Public Utilities Regulatory Policies Act of 1978 § 210 16 U.S.C. § 824(a)(3) (2000).
35. *See* Hirsh, *supra* note 8, at 81.
36. *Id*. at 123.
37. *Id*. at 124.
38. *Id*.

Some states adopted bidding schemes for markets to balance energy supply and demand, with independent energy suppliers and utilities participating to find efficient market outcomes.[39] The principle was this: "By encouraging bids from nonutility generators, power companies would only purchase the amount of electricity they needed. Competition among independent producers . . . would establish the effective avoided cost, thus leading to lower prices for utilities and their customers."[40] For example, in 1986, Virginia Power, a utility company, sought to procure 1000 MW of future energy reserves for meeting its customer demand in 1990 through an energy auction in which it received electricity generation bids (i.e. offers to provide future energy capacity) exceeding 5000 MW capacity in total. From this multitude of offers, it selected seven different independent energy producers totaling 1178 MW to provide the needed capacity.[41] The influx of energy producers providing offers allowed the bidding mechanism to succeed in areas that adopted this system.[42]

PURPA "required utilities to purchase or sell electricity from non-utility owned cogeneration facilities and small power generators," which were known as qualifying facilities at 80-MW or less, at the rate equal to their own cost of service and not the prevailing market rate for energy, which was significantly lower.[43] Instead of purchasing electricity from their own vertically-integrated power supply, PURPA required utilities to purchase power generated from these smaller, more efficient power plants. However, utilities, still owning most of the energy infrastructure needed to transfer the power being produced from these independent generators (e.g., transmission and distribution systems), were opposed to the growth of independent power producers whose electricity they now had to "wheel" across their system.[44] With regard to any unfairness resulting from this imbalance of power, FERC, interpreting provisions of the FPA, "concluded that rates that are freely negotiated by sophisticated market participants would meet § 205's just and reasonable standard" and that the two parties would negotiate acceptable terms and conditions for their transactions.[45]

To address these barriers to economic competition, such as higher costs charged by utilities for transmission for non-utility owned electricity,

39. *Id*. at 126.

40. *Id*. (providing discussion of avoided cost and bidding principles under PURPA).

41. *Id*. (often, these contracts to provide power were negotiated at attractive prices that pleased power purchasers).

42. *Id*.

43. *See* Schmidt, *supra* note 16, at 585; *see also What is a Qualifying Facility?*, FEDERAL ENERGY REGULATORY COMMISSION, https://www.ferc.gov/industries/electric/gen-info/qual-fac/what-is.asp [https://perma.cc/RK9G-64VQ].

44. *See* Schmidt, *supra* note 16, at 587.

45. *See* Peskoe, *supra* note 28, at 5.

Congress passed the Energy Policy Act of 1992 (EPAct 1992), which "exempted firms that exclusively sold energy at wholesale from the PUHCA ownership restrictions" established at the beginning of the twentieth century.[46] EPAct 1992 also "strengthened FERC's authority to increase access to transmission services" by allowing third parties to access these services.[47] FERC accomplished this Congressional mandate by passing Order 888 in 1996, which "prohibited owners and operators of monopoly transmission facilities from denying transmission access, or offering only inferior access, to other power suppliers in order to favor the monopolists' own generation and increase monopoly profits."[48] This meant that traditional utilities were required to share their infrastructure, such as transmission and distribution infrastructure, with competing independent power producers and treat them on fair and reasonable terms when charging them for access to their infrastructure.

FERC soon passed Order 2000 after concluding that in order to fully promote competition in the existing marketplace, it needed to establish standards for optional development of Regional Transmission Operators (RTOs) or Independent System Operators (ISOs).[49] These organizations took over management of the electricity grid, ensuring regional competitive markets were operating successfully within FERC's guidelines.[50] RTOs/ISOs qualify as public utilities that fall under the jurisdiction of FERC, and under Section 205, FERC has authority to review tariff amendments and procedures set by these "supervisory" organizations.[51] However, "FERC plays 'an essentially passive and reactive' role under § 205" in reviewing rates that are just and reasonable.[52] These non-profit organizations whose boards could be composed of representatives from different states now control and operate most transmission lines.[53] FERC encouraged but did not require these regional markets, and although this allowed "a new class of independent power producers or merchant generators" to enter and compete with the existing utility companies, not all states adopted the RTO/ISO model.[54]

Today, three regulatory models of electricity dominate the United States: (1) the traditional cost-of-service model; (2) the fully-restructured

46. *See* Schmidt, *supra* note 16, at 588.
47. *See* Gonzalez, *supra* note 30, at 1436.
48. *See* Schmidt, *supra* note 16, at 588, *quoting* FERC Order No. 888, 62 Fed. Reg. 12,274-01 (Mar. 14, 1997) (codified at 18 C.F.R. pt. 35).
49. *See* Peskoe, *supra* note 28, at 5, *quoting* FERC Order No. 2000, 89 FERC ¶ 61,285 (1999).
50. *Id.*
51. *Id.* at 6.
52. *Id.* at 7, *citing* Atlantic City Elec. Co. v. FERC, 295 F.3d 1, 9 (2002).
53. *See* Gonzalez, *supra* note 30, at 1437.
54. *See* Boyd & Carlson, *supra* note 22, at 831.

model; and (3) a hybrid model combining RTO/ISO management with regulated, monopoly retail services provided to investor-owned utilities (IOUs).[55] New York and Illinois operate under the fully-restructured model, which "combines competitive wholesale power markets with retail choice in the provision of electricity service," with wholesale power markets and bulk transmission administered by RTOs/ISOs that ensure real-time and future energy demands are met.[56] Retail electricity providers (REPs) (e.g., those who buy power and sell to individual customers, similar to Virginia Power discussed above) purchase power in wholesale markets through long-term power purchase agreements with independent power producers, who aim to generate low-cost electricity for purchase by these REPs in regional markets.[57] These REPs, aiming to keep the price of their electricity service low, must then compete in the marketplace for individual consumers, unlike traditional or hybrid regulatory models that grant regulated monopoly retail territories to electricity providers.[58]

In a traditionally-regulated state, state commissions regulate mostly vertically-integrated utilities through the cost-of-service principles established through the 1980s, which allow utilities and state commissions to collaborate in rate-setting proceedings to establish appropriate electricity prices that these companies can charge customers.[59] Utilities in these states do not participate in regional wholesale energy markets to purchase the electricity necessary for their customer bases.

In restructured states, REPs participate in wholesale power markets, and state commissions develop rules regarding collateral matters, such as qualifications for an energy provider selling to an in-state REP, rather than reviewing and approving prices in the wholesale power markets; the rules for which are mostly independent from state intervention.[60] Therefore, utilities providing electricity to individual customers in traditional states purchase power from REPs who control their own supply chain, while restructured states allow REPs to participate and purchase power from wholesale markets at prevailing market rates.

Restructured states initially saw higher rates for customers in their regions than traditionally-regulated states, but by 1998, the gap between them narrowed, and restructured states' rates more closely followed gas prices, implying that impacts on prices for consumers were a result of

55. *Id.* at 834.
56. *Id*. at 837.
57. *Id.*
58. *Id*. at 837.
59. *Id*. at 827 (a rate case involved presenting evidence of capital investments in utility assets and establishing a fair rate of return sufficient to finance investments in these assets).
60. *Id*. at 836–38.

market fluctuations in the price of natural gas, an increasingly common fuel input source for independent power generation.[61] The vision of a competitive marketplace under restructured states is becoming reality, since "[i]n 1997 only 1.6% of U.S. electricity was produced by generation owned by firms classified as Independent Power Producers. That figure rose to 25% by 2002 and was just under 35% in 2012."[62]

RTO/ISO management of nuclear energy generation in the New York and Illinois regions is critical, since state policies substantially influence the participants in wholesale power markets. In these regions, there is also a substantial number of nuclear plants, which typically serve as a large, inflexible source of power that could potentially cause curtailment, or prohibit entry altogether, of less expensive sources of energy such as wind or solar power. Nuclear power is important as a base load electricity source that provides reliability and stability for the electricity grid.

The Energy Information Institute (EIA) defines base load power plants as plants that are required to provide all or part of the minimum electricity load (i.e., demand) and that operate continuously, maximizing system mechanical and thermal efficiency and minimizing system operating costs.[63] Providing the minimum load for various electricity grid regions can help ensure electricity system reliability, and continuous operation helps reduce shutdown and startup costs as well as achieve various other efficiencies. Traditionally, coal and nuclear plants provided most of the base load power for utilities, and renewable energy sources such as wind and solar were considered intermittent energy sources.[64]

However, the focus of state regulators and RTO/ISO administrators recently has been on flexibility and variability rather than continuous base load output, advantages which wind and solar energy combined with other technologies such as energy storage can provide.[65] State efforts to encourage specific types of energy generation has created conflicts between efforts to ensure local grid reliability and promote clean energy with federal goals of ensuring regional competition and technological advancement through incentivizing innovation. FERC Order 1000 "requires transmission owners to develop regional plans that consider transmission

61. *See* Severin Borenstein & James Bushnell, *The U.S. Electricity Industry after 20 Years of Restructuring*, 7 ANNU. REV. ECON. 17-18 (2015).

62. *Id*. at 67.

63. *Glossary – "B"*, ENERGY INFORMATION INSTITUTE, https://www.eia.gov/tools/glossary/index.php?id=B [https://perma.cc/6X5S-FFF9].

64. Clint Wilder, *Baseload v. Flexibility: Standing the Traditional Generation Model on its Head*, RENEWABLEENERGYWORLD.COM (Oct. 10, 2016), http://www.renewableenergyworld.com/articles/2016/10/baseload-vs-flexibility-standing-the-traditional-generation-model-on-its-head.html [https://perma.cc/E2Y4-BCGA].

65. *Id*.

needs driven by public policy, including states' renewable mandates," since these policies can "'directly affect the need for interstate transmission facilities, which is squarely within [FERC]'s jurisdiction.'"[66] However, FERC cautioned against broad exercise of RTO/ISO authority (and ultimately FERC authority) over considering state policies in planning.[67] As discussed below, FERC has approved numerous state policy programs that substantially impact wholesale power markets by selectively encouraging investment in particular energy generation sources or increasing regulations to economically burden carbon-emitting sources.

II. NUCLEAR ENERGY AND STATE SUBSIDY PROGRAMS

A. NUCLEAR ENERGY HISTORY, INTERACTION WITH ELECTRICITY MARKETS, AND CURRENT TRENDS

One of the most challenging endeavors for the United States government and other developed nations this century is reducing carbon dioxide emissions from the energy generation sector, while having a reliable energy supply that can support economic growth.[68] Nuclear energy technology can deliver large capacities of power with zero emissions during the electricity generation process and has "provided almost 20% of electrical generation in the United States for over the past two decades."[69] In 2016, electricity generation from nuclear sources resulted in a reduction of 553.5 million metric tons of carbon dioxide.[70] However, drawbacks for nuclear power include long construction times and high costs that may be difficult to predict.[71]

66. *See Peskoe*, *supra* note 28, at 14, *citing* FERC Order No. 1000, 136 FERC ¶ 61,051 at para. 111 (2011).

67. *Id.*; *see also*, S.C. Pub. Serv. Authority v. FERC, 762 F.3d 41, 89 (D.C. Cir. 2014) (holding that Order 1000 merely establishes a process by which utilities are first to consider whether the policies may affect the wholesale market prior to any determinations by FERC).

68. Phungmayo Horam, *Climate change challenges post-U.S. exit from Paris Climate Agreement*, BEAM MAGAZINE (July 25, 2017), https://medium.com/thebeammagazine/climate-change-challenges-post-u-s-exit-from-paris-climate-agreement-f1dcf9391bdb [https://perma.cc/V9UX-NQD8].

69. *Nuclear Reactor Technologies*, DEPARTMENT OF ENERGY OFFICE OF NUCLEAR TECHNOLOGIES, https://www.energy.gov/ne/nuclear-reactor-technologies [https://perma.cc/T6VG-SLQP]); *see also U.S. Capacity Factors by Fuel Type*, NUCLEAR ENERGY INSTITUTE, https://www.nei.org/Knowledge-Center/Nuclear-Statistics/US-Nuclear-Power-Plants/US-Capacity-Factors-by-Fuel-Type [https://perma.cc/97C6-GB3G] (noting that in 2015, nuclear energy generation in the United States averaged a capacity factor of 92.2%, meaning that nuclear energy technology is significantly more efficient at achieving fuel conversion and output).

70. U.S. Energy Information Administration, *Emissions Avoided by U.S. Nuclear Industry*, NUCLEAR ENERGY INSTITUTE, https://www.nei.org/resources/statistics/emissions-avoided-by-us-nuclear-industry [https://perma.cc/923M-AE3K]; U.S. Energy Information Administration, U.S. Electricity Generation Fuel Shares, NUCLEAR ENERGY INSTITUTE, https://www.nei.org/resources/statistics/us-electricity-generation-fuel-shares-1949-2016 [https://perma.cc/QR68-BHRM].

71. DECONSTRUCTING ENERGY LAW AND POLICY: THE CASE OF NUCLEAR ENERGY 16 (Raphael J.

Nuclear power emerged as a source of electricity generation after World War II, and researchers in 1980 found that the "prospects for nuclear energy depend on a variety of factors: the success of energy conservation, the long-term competitiveness of nuclear energy, the growth of coal production," and the risk of future accidents and regulatory environments.[72] With regard to competition, "nuclear energy in the US has significant competition as an electricity supply source, not just from coal and gas, but increasingly from renewable energy."[73] Arguably, the fragmentation of the United States electricity markets in the latter part of the twentieth century caused financial difficulties for nuclear energy companies who often designed plans for large scale electricity supply projects and dealt with multiple regional electricity markets and regulations.[74] Large-scale projects often require guarantees of revenue returns in the form of power purchase agreements before companies can raise necessary capital for construction, and competition has introduced uncertainty in receiving revenues and cost recovery.[75] Regarding subsidies, states have a significant role in the development of new nuclear plants. However, the deregulation of electricity markets (i.e., establishment of regional competitive markets) creates "a conflict with considerable tension between states' attempts to manage their economies, environments and financial resources."[76]

The nuclear sector has seen a lack of commitments from the federal government over the last two decades as far as financial incentives and support.[77] Most importantly, inaction on a carbon market or carbon tax, which would provide financial rewards to carbon-free electricity generation sources such as nuclear energy through market mechanisms, has failed to give nuclear energy a cost advantage regarding its non-CO_2-producing electricity production.[78] Indeed, "[t]he costs associated with carbon dioxide emissions are generally not reflected in electricity market prices."[79] In 2013, nuclear received approximately $1.7 billion in energy-specific

Heffron ed., Edinburgh University Press, 2015); *see also id*. at 28 (noting that "the US Federal government has been slow . . . to resolve and fund research" in nuclear waste management).

72. *Id*. at 1; *see also id*. at 19 (In 2016, nuclear energy faced competition from energy efficiency, renewable energy, the declining cost of energy due to an influx of natural gas in wholesale energy markets, and public opposition due to domestic and international accidents.).

73. *Id*. at 64.

74. *Id*. at 65.

75. *Id*.

76. *Id*. at 72.

77. *Id*. at 99.

78. *Id*.

79. Justin Gundlach & Romany Webb, *Carbon Pricing in New York ISO Markets: Federal and State Issues*, SABIN CENTER FOR CLIMATE CHANGE LAW, 26 (Feb. 2017), http://columbiaclimatelaw.com/files/2017/02/Gundlach-Webb-2017-02-Carbon-Pricing-in-NYISO-Markets.pdf [https://perma.cc/8E2M-L78A] (discussing societal costs of carbon dioxide emissions as economic externalities from a lack of price on carbon and a resulting market failure).

subsidies, while natural gas received $2.3 billion and renewables received over $15 billion.[80] Nonetheless, "[t]he share of nuclear generation owned by [independent power producers] rose from zero in 1997 to almost 50% in 2012, as utilities sold off their nuclear assets."[81] Capital expenditures in the industry peaked in 2012 at $9.02 billion but have since steadily decreased, and in 2017 capital spending totaled $5.34 billion.[82] Total generating costs, which include capital, fuel, and operating costs, also decreased by 19 percent since 2012 due to decreases in capital expenditures, fuel, and operations costs.[83]

Under President Donald Trump, the nuclear industry has already seen proposals to support its survival and is hoping that the federal government will intervene more than the Obama administration and save an ailing industry.[84] The current energy supply mix is changing, and nuclear plants that traditionally received preferable regulatory treatment with regard to cost recovery are now facing challenges from natural gas, which will likely continue to make nuclear plant construction or operation uneconomical given its low prices.[85] Indeed, former Chief Executive Officer of Exelon Corporation, the largest producer of nuclear power, noted that "[a]s long as natural gas is anywhere near current price forecasts, you can't economically build a merchant nuclear plant."[86] Since 2013, six nuclear reactors . . . have shut down permanently, and several energy companies have announced plans to close six additional plants throughout the U.S between 2019 and 2025.[87]

When nuclear plants close, they often have disproportionate impacts on the towns they operate in, as well as nearby regions. For example, the Vermont Yankee nuclear plant closure, due to competitive market pressures, had devastating economic impacts on the town of Vernon,

80. Direct Federal Financial Interventions and Subsidies in Energy Fiscal Year 2013 (Table ES2. Quantified energy-specific subsidies and support by type, FY 2010 and FY 2013), U.S. ENERGY INFORMATION ADMINISTRATION, https://www.eia.gov/analysis/requests/subsidy/ [https://perma.cc/RX72-JSBV].

81. *See* Borenstein & Bushnell, *supra* note 61, at 7.

82. *Nuclear Costs in Context*, at 2-3, NUCLEAR ENERGY INSTITUTE (Aug. 2017), https://www.nei.org/CorporateSite/media/filefolder/resources/reports-and-briefs/nuclear-costs-context-201810.pdf. [https://perma.cc/X9JS-YCYL]

83. *Id.*

84. Jonathan Crawford, *Trump and U.S. Nuclear Power Find Ground in Jobs Push*, BLOOMBERG, (Feb. 7, 2017 10:03 AM) https://www.bloomberg.com/news/articles/2017-02-07/trump-and-u-s-nuclear-power-find-common-ground-in-jobs-push [https://perma.cc/3YTM-BTW3].

85. *See* Boyd & Carlson, *supra* note 22, at 849 ("these new reactors would never be built in states operating in hybrid and restructured markets").

86. *Id. citing* Mark Clayton, *Nuclear Power a Viable Competitor in US Energy Market, Study Finds*, CHRISTIAN SCI. MONITOR (Sept. 17, 2010) (quoting John Rowe, Exelon CEO), http://www.csmonitor.com/USA/2010/0917/Nuclear-power-a-viable-competitor-in-US-energy-market-study-finds [http://perma.cc/WU25-V66G].

87. *See supra* note 82, at 5.

Vermont.[88] The plant had a payroll of $66 million and impacts on local suppliers and businesses totaled approximately $500 million.[89] Vernon lost half of its tax base with the plant closure, severely impacting funding for a library, town hall, recreation center, and elementary school, as well as its $2 million emergency fund.[90]

Marketplace risk for nuclear power is evident with the issues discussed in this paper, resulting from dropping costs of energy production and lower revenues for independent power producers. This risk places economic burdens on companies attempting to engage in long-term power purchase agreements, often at fixed prices for the duration of the contract. Recent trends reflect the rise of competitive energy firms as well as new technological and market risks, familiar trends that began with Edison and Insull in New York and Illinois in the beginning of the twentieth century.

B. OVERVIEW OF REGIONAL ENERGY MARKETS AND STATE PROGRAMS FOR NUCLEAR ENERGY

New York operates its electricity marketplace for transmission and wholesale electricity under the supervision of an ISO, the New York Independent System Operator (NYISO).[91] NYISO manages the energy markets that allocate real-time energy delivery, ancillary services (e.g., grid maintenance), and capacity (e.g. future energy reserves).[92] Because NYISO oversees an electricity grid that is physically connected throughout the eastern United States, and involves energy and service transactions across multiple states, it is subject to FERC authority.[93] This means that NYISO must notify FERC and submit filings before modifying rates or rules and regulations pertaining to rates.[94] FERC has approved market-based rates on the theory that they are "just and reasonable" since the market is designed to prohibit entities from holding market power, thus freely negotiated contracts do not violate the standard.[95]

Illinois operates in two regional marketplaces, the Midcontinent

88. Saqib Rahim, *When a town loses its economic center*, E&E NEWS (Oct. 23, 2017), https://www.eenews.net/stories/1060064251[https://perma.cc/WR7E-JG8N].

89. *Id.*

90. *Id.*

91. *See* Gundlach & Webb, *supra* note 79, at 10.

92. *Id.* at 12.

93. *Id*. at 15.

94. *Id*. at 2021 ("FERC's review is intended to ensure that the rates and practices set out [by NYISO] are just and reasonable"); *see also id*. *citing* Morgan Stanley Capital Group Inc. v. Pub. Util. Dist. No. 1, 554 U.S. 527, 532 (2008) (holding that the just and reasonable standard is "incapable of precise judicial definition").

95. *Id*. at 22 ("FERC requires the seller to demonstrate that it lacks or has adequately mitigated market power . . . FERC monitors sellers' activities in the market to ensure that they do not re-attain market power").

Independent System Operator, Inc. (MISO) and the PJM Interconnection, L.L.C. (PJM), an RTO.[96] Both MISO and PJM conduct wholesale auctions that include independent power producers and other market participants that provide ancillary energy services. Similar to NYISO, both MISO and PJM are subject to FERC authority and stem from the ability of states and utilities to implement RTO/ISO management of the electricity grid and wholesale energy markets under FERC Order 2000. All three marketplaces use wholesale auction bidding by accepting bids from generators at increasing prices, beginning with the lowest-priced bid, until the instantaneous or future demand is met. Each bidding location utilizes locational-based marginal pricing (LMP), a mechanism by which prices reflect local demand and supply conditions as well as transmission constraints that may exist when moving electricity across the grid to meet demand.[97] Market participants propose bids at prices that are economically efficient for them, thus when bids are accepted, these firms receive revenues above their expected marginal costs. When the bid price rises too high, market participants demanding higher prices than the market clearing price are excluded. In effect, these prices signal to market participants when to bid into regional energy market auctions.

In a simple example, an RTO/ISO determines that the demand for a particular zone in its region is 10,000 MW, and it will run an auction to allow procurement of enough energy to meet this amount with the goal of establishing a market clearing price.[98] A 6000 MW nuclear plant is often forced to bid at a low price in order to ensure its capacity enters the market to avoid increased operational costs from shutdown and startup.[99] It will bid 6000 MW for $1 per MW-year. The next lowest-cost bidder, bidder 2, an efficient power plant, offers 3000 MW at $5000 per MW-year. The third bidder, a less efficient power plant, offers 1000 MW at $15,000 per MW-year. The offers from these three bidders totals the 10,000 MW in demand needed for the zone. A fourth bidder, offering 1000 MW at $20,000 per MW-year, is excluded from the market since bidder 3 is offering a lower price per MW-year. The market clearing price in this

96. *About MISO*, https://www.misoenergy.org/about/ [https://perma.cc/9HHF-9GHG]; *see also PJM*, http://www.pjm.com/ [https://perma.cc/3H8L-HRCX].

97. Mathangi Srinivasan, *Locational Based Marginal Pricing*, New York Market Orientation Course, NYISO (Oct. 17, 2018), http://www.nyiso.com/public/webdocs/markets_operations/services/market_training/workshops_courses/Training_Course_Materials/NYMOC_MT_ALL_201/Locational_Based_Marginal_Pricing.pdf [https://perma.cc/4WX3-HSD6]; *see also* PJM Learning Center, *Locational Marginal Pricing*, https://learn.pjm.com/three-priorities/buying-and-selling-energy/lmp.aspx [https://perma.cc/GP8E-3ZZH].

98. Robin Deliso Woodcock, *Your Definitive Guide to (PJM) Capacity Auctions*, ENERGYSMART BLOG (Jan. 28, 2015), https://www.energysmart.enernoc.com/your-definitive-guide-pjm-capacity-auctions [https://perma.cc/9K7Q-94MQ].

99. *Id.*

example is $15,000 per MW-year, as established by the third bidder, and this amount is paid for each MW-year provided by the three bidders. The nuclear plant, although bidding at $1 per MW-year, also receives $15,000 per MW-year for the 6000 MW it provides. However, this amount may nonetheless be below the actual cost of providing the 6000 MW in capacity, and the nuclear plant may be forced to operate at a loss due to prevailing market clearing prices. Each ISO/RTO is responsible for determining the region's' real-time energy demands and capacity in order to administer the auctions effectively.[100]

The New York Public Service Commission recently adopted a Clean Energy Standard (CES) that potentially interferes with FERC's wholesale market authority by subsidizing certain market participants' bidding in regional markets.[101] The CES utilizes the social cost of carbon, a figure determined to represent the dollar amount to society of avoided long-term damage done by every ton of carbon dioxide emitted into the atmosphere, to value carbon-free electricity generation and establish the zero emission credit (ZEC) representing this value.[102] The state will provide $965 million over two years to three nuclear plants that were struggling to compete in regional markets due to the low price of natural gas.[103] In considering the market structure of NYISO, these nuclear plants had failed to successfully compete in the market and were unable to secure revenues above their costs, facing bankruptcy.[104] The CES requires that LSEs procure ZECs from the New York State Energy Research & Development Authority.[105] With this procurement mandate serving effectively as a subsidy payment to ZEC producers (i.e. nuclear plants), ZECs essentially serve to lower the cost faced by these electricity generators, allowing them to reenter the market at artificially low bidding prices. This is contrary to free market principles envisioned by FERC, which aim to reward cost-effective, innovative market participants that strive to achieve the lowest marginal costs of service in providing electricity to consumers.

100. *See generally, View Point – Capacity Markets: Enabling PJM to obtain sufficient resources to reliably meet the needs of electric consumers*, PJM (2016) http://www.pjm.com/~/media/about-pjm/newsroom/fact-sheets/20161019-view-point-capacity-markets.ashx [https://perma.cc/BR2P-2VXP].

101. Robert Walton, *Updated: New York PSC approves 50% clean energy standard, nuclear subsidies*, UTILITYDIVE (Aug. 1, 2016), http://www.utilitydive.com/news/updated-new-york-psc-approves-50-clean-energy-standard-nuclear-subsidies/423635/ [https://perma.cc/2SXF-L6W5].

102. *See generally The Social Cost of Carbon*, U.S. ENVIRONMENTAL PROTECTION AGENCY https://19january2017snapshot.epa.gov/climatechange/social-cost-carbon_.html [https://perma.cc/9DR9-9X7M].

103. Robert Walton, *What the Hughes v. Talen Supreme Court decision means for state power incentives*, UTILITYDIVE (Apr. 25, 2016), http://www.utilitydive.com/news/what-the-hughes-v-talen-supreme-court-decision-means-for-state-power-incen/418046/ [https://perma.cc/J96D-SZKY].

104. *Id.*

105. *See* Clean Energy Standard, https://www.nyserda.ny.gov/All-Programs/Programs/Clean-Energy-Standard [https://perma.cc/E96L-FAZ8].

Similarly, later in 2016, Illinois passed the Future Energy Jobs Act, which also made amendments to the Illinois Power Agency Act in establishing a ZEC program.[106] Arguably, legislators handed out $2.4 billion in subsidies to two nuclear plants that were no longer economical to operate over ten years, citing environmental benefits of zero emission energy generation technology and economic interests.[107] The two plants lost a combined $100 million per year because competing energy generation sources, such as natural gas and wind energy, caused lower market clearing prices and revenues for market participants.[108]

Among other changes to state renewable energy and energy efficiency policies, FEJA establishes a zero emission standard that will support these at risk nuclear facilities by directing development of "plans and processes for the procurement of zero emission credits from zero emission facilities," specifically nuclear plants, commencing June 1, 2017.[109] The program awards ten-year contracts for procurement of ZECs from zero emission facilities, and the zero emission credit prices awarded on these procurement contracts will be set through a statutory formula which will be set once per delivery year.[110] The statute incorporates environmental concerns into winning bid selection criteria by providing that winning bids shall be selected "based on public interest criteria that include, but are not limited to, minimizing carbon dioxide emissions that result from electricity consumed in Illinois and minimizing sulfur dioxide, nitrogen oxide, and particulate matter emissions that adversely affect the citizens of [Illinois]."[111]

106. Future Energy Jobs Act, Public Act 099-0906 (12/7/16), http://www.ilga.gov/legislation/99/SB/PDF/09900SB2814lv.pdf [https://perma.cc/ZV3S-92XT]; *see also* Benjamin Storrow, *Midwestern lawmakers green the grid, slightly*, UTILITYDIVE (Dec. 19, 2016).

107. *See* Storrow, *supra* note 106; *see also Oddball political coalition lauds new energy policy*, UTILITYDIVE (Dec. 12, 2016) ("Critics said the new law would force utility customers to pay billions of dollars to subsidize the two unprofitable nuclear plants owned by a highly profitable corporation. Supporters said the legislation would bring a series of long-term benefits by keeping the nuclear plants open while increasing investment in renewable power and energy efficiency").

108. James Conca, *Illinois Sees the Light – Retains Nuclear Power*, FORBES (Dec. 4, 2016), https://www.forbes.com/sites/jamesconca/2016/12/04/illinois-sees-the-light-retains-nuclear-power/#1f3324143e7b [https://perma.cc/4FZY-LUG8].

109. 20 Ill. Comp. Stat. Ann. 3855/1-75(a) (2017).

110. 20 Ill. Comp. Stat. Ann. 3855/1-75(d-5)(1) (2017).

111. 20 Ill. Comp. Stat. Ann. 3855/1-75(d-5)(1)(C) (2017).

III. INTERACTION BETWEEN STATE ENERGY POLICIES AND FEDERAL LAW

A. HUGHES AND FERC AUTHORITY OVER WHOLESALE POWER MARKETS

In 2016, in "the most complicated and lowest-profile of recent FERC cases to come before the U.S. Supreme Court," the Court provided some guidance regarding the ability of states to alter rules and impact federally-regulated wholesale energy markets.[112] Maryland regulators anticipated shortages in electricity supply with coming coal plant retirements and decided to incentivize in-state construction of a 650-MW gas-fired plant by allowing state load-serving entities (LSEs) (e.g., electric utilities serving retail customers) to compensate the difference between a state-stipulated contract price and the market clearing price in PJM.[113] Essentially, this provided market price protection through a "contract for differences" by providing payment guarantees to the market participant in case accepted bids were below the cost of service. The Court found that "FERC extensively regulates the structure of the PJM capacity auction to ensure that it efficiently balances supply and demand, producing a just and reasonable clearing price" and concluded that this federal authority preempted Maryland's incentives for in-state energy generation.[114]

The Court stressed that this was a narrow decision, focused on one gas-fired plant in particular, with identifiable market advantages, and "*Hughes* simply does not speak to how wholesale markets fail to price important values, such as environmental concerns and reliability."[115] The Court found preemption upon finding that the contract for differences disregarded an interstate wholesale rate required by FERC.[116]

The contract mechanism in *Hughes* was intended to disregard the wholesale market prices resulting from auctioning. Arguably, if FERC has not adopted a regime that prices these attributes in the wholesale market, such as setting a federal price on carbon emissions, states are free to adopt initiatives that do not intrude wholesale rate authority, such as the CES ZEC payments or FEJA's zero emission standard.[117]

New York and Illinois have attempted to price carbon emissions within their states and award certain generators of zero emission electricity directly using similar out-of-market prices, actions that arguably impact

112. Hughes v. Talen Energy Mktg. LLC, 136 S. Ct. 1288 (2016); *see also* Walton, *supra* note 103.
113. *See* Walton, *supra* note 103.
114. *Hughes*, 136 S. Ct. at 1294–97.
115. Jim Rossi, *The Brave New Path of Energy Federalism*, 95 TEX. L. REV. 399, 448-49 (2016).
116. *Hughes*, 136 S. Ct. at 1299.
117. *Id.*

market wholesale rates and ultimately FERC authority. Indeed, "Congress was likely unaware of the full range of challenges that would be presented to modern energy markets . . . ."[118] As discussed below, federal district courts in New York and Illinois have provided recent guidance in interpreting the FPA and *Hughes* in considering the permissibility of state policies that can potentially impact federal energy markets.

The dormant Commerce Clause can limit the scope and impact of state programs aimed to incentivize generation and analyzes whether the "state statute discriminates against out-of-state businesses or whether it treats both in-state and out-of-state businesses alike."[119] Facially discriminatory laws against interstate commerce are unconstitutional, while facially neutral laws are examined further for discriminatory effects through analysis of their impacts on interstate commerce.[120] Lastly, if the law is found to be discriminatory, then it will only be upheld "so as long as its benefit outweighs its burden on interstate commerce."[121] Given the intricate nature of the energy system, including the complexity of market transactions and uncertainty about future outcomes, it can be difficult to assess impacts on interstate commerce. However, "courts have applied strict scrutiny to state laws that were enacted simply to promote job creation or economic development, if by doing so, they unduly burden interstate commerce."[122]

Plaintiffs who bring dormant Commerce Clause claims must have standing, which requires that plaintiffs have "an 'injury in fact'" and that the injury be "fairly traceable" to the challenged action of the defendant.[123] Thus, if the injuries are "not traceable to discrimination against the commerce of other states," then plaintiffs do not have standing to bring a dormant Commerce Clause claim.[124] Specifically, the dormant Commerce Clause protects the economic interests of out-of-state entities, and "[p]laintiffs must 'allege an injury stemming from the application of the [state policy] in a manner discriminatory to out-of-state interests' . . . whether due to facial discrimination against or an undue burden on out-of-state economic interests."[125]

118. *Id.*

119. *See* Schmidt, *supra* note 16, at 618, 620 ("The Commerce Clause provides Congress with the power '[t]o regulate commerce . . . among the several States'" (citing U.S. CONST. art. I, § 8, cl. 3)).

120. *Id*. at 621.

121. *Id*. at 624 (known as the "Pike balancing test" (citing Pike v. Bruce Church, 397 U.S. 137, 142 (1970)).

122. *Id*. at 62930 ("Even if the Court characterizes the purpose as promoting local interests, so long as the law regulates evenhandedly, it will be characterized as legitimate").

123. Lujan v. Defenders of Wildlife, 504 U.S. 555, 560 (1992).

124. *See infra* note 145, at 7.

125. *See supra* note 123, at 582.

B. CHALLENGES TO THE NEW YORK CES ORDER AND ZEC PROGRAM IN FEDERAL COURT

In New York, a federal court upheld the ZEC program under the CES, dismissing challenges from independent power producers who argued that the ZEC program intruded federal jurisdiction to regulate rates and tariffs in wholesale power markets and violated the Constitution by discriminating against out-of-state power plants.[126] The opinion begins with identifying that climate change is an issue and that "New York and many other States have decided that they will do their part to reduce the emissions that contribute to global warming."[127] In relying heavily on *Hughes*, the court examines the CES order in detail and concludes that (1) the ZEC program is not field preempted under the FPA, (2) is not conflict preempted under FERC objectives, (3) and does not violate the dormant Commerce Clause.

C. THE ZEC PROGRAM AND FEDERAL PREEMPTION

Plaintiffs argued that the ZEC program is both field preempted and conflict preempted.[128] However, the court concluded that the program is not "tethered" to wholesale auctions, does not directly affect the wholesale prices in these auctions, and does not interfere with FERC's objective of maintaining competitive energy markets.[129] "Field preemption exists where 'Congress has forbidden the State to take action in the *field* that the federal statute pre-empts.'"[130] By contrast, conflict preemption "exists where compliance with both state and federal law is impossible, or where the state law stands as an obstacle to the accomplishment and execution of the full purposes and objectives of Congress."[131]

In considering field preemption, the court recognized, citing *Hughes*, that the "FPA is a paragon of cooperative federalism; it divides responsibility for the regulation of energy between state and federal regulators."[132] Most importantly, the court noted that that where federal and state efforts must coordinate within an administrative framework in pursuit of common purposes, the court is less likely to find federal preemption.[133] Here, FERC has substantial authority over wholesale rates and rules and has authority to "ensure that rules or practices 'affecting'

126. Coalition for Competitive Electricity, v. Zibelman, 272 F.Supp. 3d 554 (S.D.N.Y. July 25, 2017).
127. *Id*. at 554.
128. *Id*. at 563.
129. *Id*. at 569–77.
130. *Id*. at 567 (*citing* Oneok, Inc. v. Learjet, Inc., 135 S. Ct. 1591, 1595 (2015)).
131. *Id*.
132. *Id*.
133. *Id*.

wholesale rates are just and reasonable."[134] *Hughes* "left open the possibility for States to 'encourag[e] production of new or clean generation through measures untethered to a generator's wholesale market participation.'"[135] Plaintiffs claimed that the program is an "impermissible tether" because "(1) a nuclear generator is eligible for a ZEC only if the NYISO auction rates are insufficient . . . (2) ZEC prices are calculated using forecast wholesale rates; and (3) the nuclear generators receiving the ZECs sell all of their power directly into the auction markets."[136] The court found that (1) there exist many state programs that "involve propping up the operation of a generator that might otherwise be unprofitable," (2) ZEC prices are unrelated to the recipient's market participation, and (3) that the "CES Order itself does not require the nuclear generators to sell into the NYISO auction."[137] In comparing to *Hughes*, the court recognized that in *Hughes* "there was a direct and concrete tie (or tether) between the contracts-for-difference and the generator's wholesale market participation"[138] and that "New York has successfully threaded the needle left by *Hughes* that allows States to adopt innovative programs to encourage the production of clean energy."[139]

The court also dismissed plaintiff's conflict preemption claim, noting that "when the State is legitimately regulating a matter of state concern, 'FERC's exercise of its authority must accommodate" that state regulation "[u]nless clear damage to federal goals would result.'"[140] The ZEC program "does not thwart the goal of an efficient energy market; rather, it encourages through financial incentives the production of clean energy" since it does not guarantee a particular market price for ZEC-eligible recipients and does not present "clear damage" required for a finding of conflict preemption.[141] To hold otherwise, the court importantly noted, "would call into question [renewable energy credits] and all state subsidies, such as tax incentives and land grants" that also exert "price-distorting effects on market signals and allow some generators to clear the auction when they otherwise would be priced out."[142]

134. *Id*. (*citing* FERC v. Elec. Power Supply Ass'n, 136 S. Ct. 760, 768 (2016)).
135. *Id*. at 568 (*citing* Hughes at 1299).
136. *Id*. at 569.
137. *Id*.
138. *Id*. at 562.
139. *Id*. at 564.
140. *Id*. at 564 (*quoting* Nw. Cent. Pipeline Corp. v. State Corp. Comm'n of Kansans, 109 S. Ct. 1262, 522 (1989)).
141. *Id*. at 566.
142. *Id*.

D. THE ZEC PROGRAM AND THE DORMANT COMMERCE CLAUSE

The court also dismissed plaintiffs' dormant Commerce Clause claims since "they do not allege a nexus between their injury and any discriminatory aspect of the ZEC program."[143] To violate the dormant Commerce Clause, a state law or regulation must "(1) clearly [discriminate] against interstate commerce in favor of intrastate commerce, (2) [impose] a burden on interstate commerce incommensurate with the local benefits secured, or (3) [have] the practical effect of 'extraterritorial' control of commerce occurring entirely outside the boundaries of the state in question."[144] Indeed, the court held that plaintiffs failed to allege injury to their out-of-state entities arising from discrimination against or an undue burden from the ZEC program.[145] The court recognized that plaintiffs would be similarly burdened if the ZEC program expanded to out-of-state nuclear plants (i.e., their power plants would still not receive ZEC payments), and therefore, the alleged injury falls outside the "zone of interests" protected by the dormant Commerce Clause.

E. CHALLENGES TO ILLINOIS' FEJA AND ZEC PAYMENTS IN FEDERAL COURT

Earlier in July, a federal district court in the Northern District of Illinois dismissed challenges to Illinois' FEJA and its ZEC program, where consumer plaintiffs and independent power producers (the Electric Power Supply Association) had brought similar claims of preemption and dormant Commerce Clause violations.[146] Plaintiffs argued that the ZEC program is preempted by the FPA and FERC authority over wholesale markets and alleged that "a state regulation that substantially affects the quantity or terms of wholesale sales is preempted."[147] However, the court held that "Illinois does not require participation in wholesale auctions in order to receive ZECs . . . [nuclear generators] can receive ZECs even if they do not participate in the energy auction."[148] Therefore, since the ZEC does not require that nuclear generators clear auctions in PJM or MISO, the court concluded that "the state . . . is not imposing a condition directly on wholesale transactions."[149] In conclusion, the court held that Illinois "has sufficiently separated ZECs from wholesale transactions such that the [FPA] does not preempt the state program under principles of field

143. *Id.*
144. *Id.*
145. *Id.* at 567.
146. Vill. of Old Mill Creek v. Star, No. 17 CV 1163, 2017 WL3008289, (N.D. III. July 14, 2017).
147. *Id.* at *11.
148. *Id.* at *13.
149. *Id.*

preemption."[150] In dismissing the conflict preemption claim, the court held that there had not been "clear damage" to FERC's goals from the ZEC program and that "the interplay between state and federal regulation can continue to exist" since "[t]he regulatory structure remains unaltered, and FERC's power undiminished."[151]

Lastly, plaintiffs claimed that the ZEC program fails the *Pike* balancing test and violates the dormant Commerce Clause "because its impacts on interstate commerce far outweigh any claimed environmental benefits" and since it "distorts the market by driving out and deterring the entry of more cost-efficient, environmentally-friendly, out-of-state generators."[152] Additionally, plaintiffs pointed to statements of Illinois Governor Bruce Rauner stating that FEJA was intended to protect the Clinton and Quad Cities plants and related jobs.[153] The court held that the remarks about potential job-saving attributes of FEJA do not negate the state's legitimate interests in (1) environment and public health and (2) creating and regulating a market to encourage a power mix of its choosing.[154] Lastly, the ZEC program only "indirectly burdens other generators' ability to compete in wholesale auctions," and thus, the dormant Commerce Clause claim fails.[155]

F. ANALYSIS AND RECOMMENDATIONS FOR INCENTIVIZING CLEAN ENERGY GENERATION SOURCES

The integrated nature of wholesale energy markets, involving multiple states and regulatory agencies in addition to RTOs/ISOs, requires broader planning and policy implementation of climate change initiatives aimed at incentivizing carbon-free electricity generation. State policies, by contrast, "[d]ue to their partial application . . . provide only incomplete and inchoate remedies for the market failure [of carbon pricing] and arguably further distort the market, thereby impairing effective competition among wholesale buyers and sellers."[156] The FPA gives FERC authority over wholesale sales of electricity, and subsequent orders by FERC have asserted federal authority over certain aspects of regional wholesale market operations.[157] PJM and NYISO are exploring options to better integrate carbon-pricing within their regions and ensure market efficiency.

150. *Id*. at *14.
151. *Id*.
152. *Id*. at *16.
153. *Id*.
154. *Id*.
155. *Id*.
156. *See* Gundlach & Webb, *supra* note 79, at 61 ("any carbon pricing scheme proposed by NYISO would have to be integrated with [regional carbon pricing and trading markets]").""
157. *See supra* note 23.

Additionally, the Department of Energy (DOE) under Secretary Rick Perry has responded to industry and political concerns and has proposed new market rules to provide compensation to base load power generation plants such as coal and nuclear, "outlining what would be the biggest overhaul in competitive energy markets since their establishment in the late 1990s."[158] However, on January 8, 2018, FERC rejected the DOE NOPR and directed regional market operators to examine grid resilience issues and submit relevant information to FERC to inform future regulatory action in a new proceeding.[159]

The regional market concept has effectively incentivized investment in the renewable energy sector at unprecedented levels, with a recent plan from PacifiCorp to invest in a $3.5 billion wind farm in light of "PURPA-enabled" success in wind and solar.[160] Additionally, American Electric Power also introduced an investment plan of $1.8 billion into "competitive, contracted renewable energy projects."[161] Allowing these ZECs to occur and thereby potentially affect wholesale market auctions could introduce regulatory uncertainty and impair investment, since "[t]he fact that, at any time, regulatory agencies could introduce a subsidy for certain resources that would suppress wholesale market prices will very likely eliminate the willingness for competitive suppliers to enter the wholesale market."[162]

Indeed, PJM reports that the recently "proposed subsidy solutions in all cases ignore the opportunity cost of subsidizing uneconomic units, which is the displacement of resources and technologies that would otherwise be economic."[163] A recent study found that despite their

158. Department of Energy, Grid Resiliency Pricing Rule Notice of Proposed Rulemaking, 82 Fed. Reg. 46940, 46941 (Oct. 10, 2017), https://www.gpo.gov/fdsys/pkg/FR-2017-10-10/pdf/2017-21396.pdf; *see also* Gavin Bade, *Updated: DOE proposes cost recovery for baseload generators in new FERC rule*, UTILITYDIVE (Sept. 29, 2016), https://www.utilitydive.com/news/updated-doe-proposes-cost-recovery-for-baseload-generators-in-new-ferc-rul/506137/ [https://perma.cc/JN3G-NHX5].

159. Order Terminating Rulemaking Proceeding, Initiating New Proceeding, and Establishing Additional Procedures, 162 FERC ¶ 61,012-01 (2018).

160. Jeff St. John, *Breaking Down PacifiCorp's $3.5B Wind Power Investment Plan*, GREENTECH MEDIA (Apr. 4, 2017), https://www.greentechmedia.com/articles/read/breaking-down-pacificorps-3.5b-wind-power-investment-plan [https://perma.cc/YK98-7YU6]; *see generally Solar Market Insight Report 2016 Year in Review*, SOLAR ENERGY INDUSTRIES ASSOCIATION, http://www.seia.org/research-resources/solar-market-insight-report-2016-year-review [https://perma.cc/P8BR-MUXB]..

161. Peter Maloney, *AEP to invest $1.8B in renewable energy*, UTILITYDIVE (Nov. 7, 2017), https://www.utilitydive.com/news/aep-to-invest-18b-in-renewable-energy/510192/ [https://perma.cc/P54G-ZHVH].

162. Stu Bresler, *Potential Alternative Approach to Expanding the Minimum Offer Price Rule to Existing Resources*, at 1, PJM Conference and Training Center (Aug. 11, 2016), http://www.pjm.com/~/media/committees-groups/stakeholder-meetings/grid-2020-focus-on-public-policy-market-efficiency/meeting-materials/20160816-potential-alt-solution-to-the-min-offer-price-rule-for-existing-resources.ashx [https://perma.cc/P7SZ-MN4L].

163. *State of the Market Report for PJM Volume 2: Detailed Analysis*, MONITORING ANALYTICS LLC (Mar. 9, 2017), at 2, http://www.eenews.net/assets/2017/03/10/document_pm_06.pdf [https://perma.cc/EHB9-GR3P].

imperfections, regional markets lower costs, saving about $3 billion a year in electricity generation.[164] Distorting market incentives for a period as long as ten years could potentially harm regional market structures and decrease savings for consumers in the long run.

Those defending the subsidies claim that they are similar in structure and legal validity to renewable energy certificates/credits (RECs) currently offered by states and sold in energy marketplaces.[165] Both New York and Illinois wholesale markets currently include or plan to include RECs.[166] The Environmental Protection Agency defines RECs as a market-based instrument that is a representation of environmental and social benefits of renewable energy generation.[167] When renewable energy generators produce electricity, one REC is awarded per MW-hour of electricity generated. RECs, through certificate tracking systems, can be sold separately or together with the electricity they generate.[168] RECs transfer the ownership rights of the attributes of renewable electricity generation "despite the physical inability to identify the exact generating source" to which they are attributed.[169] In 2003, FERC issued an order stating that RECs are "outside the confines of PURPA" and that a utility purchasing electricity from a power generator does not automatically receive ownership rights to RECs.[170] Lastly, FERC stated that states can adopt legislation that regulates and assigns ownership of RECs.[171]

In upholding the CES ZEC program and Illinois' FEJA, federal district courts likened ZECs to RECs.[172] Most importantly, "FERC has disclaimed jurisdiction over RECs . . . when those instruments are sold independently of FERC-jurisdictional energy sales."[173] In New York, the court concluded that ZEC transactions are separate from wholesale energy sales and that "FERC's acknowledgement that RECs are outside its jurisdiction indicates that similar programs . . . distinct from wholesale

164. Steve Cicla, *Imperfect Markets Versus Imperfect Regulation in U.S. Electricity Generation* (Jan. 22, 2017) at 40, https://www.heartland.org/_template-assets/documents/publications/UofC%20Electricity%20Gov%20v%20Market.pdf [https://perma.cc/YPR6-8WM7].

165. *See* Walton, *supra* note 103.

166. *See generally Renewable Energy Certificates (RECs)*, U.S. ENVIRONMENTAL PROTECTION AGENCY (last visited Apr. 1, 2017), https://www.epa.gov/greenpower/renewable-energy-certificates-recs [https://perma.cc/8DHS-RH27].

167. *Id*.

168. *Renewable Electricity: How do you know you are using it?* at 1, National Renewable Energy Laboratory (Aug. 2015), https://www.nrel.gov/docs/fy15osti/64558.pdf [https://perma.cc/7ZRY-98L9].

169. Todd Jones et al., *The Legal Basis for Renewable Energy Certificates*, at 7, Center for Resource Solutions (June 17, 2015), http://resource-solutions.org/wp-content/uploads/2015/07/The-Legal-Basis-for-RECs.pdf [https://perma.cc/3HQY-CSH8].

170. American Ref-Fuel Company, 105 F.E.R.C. ¶ 61,004, 61,007 (2003).

171. *Id*.

172. *See supra* note 125, at *563; *see also supra* note 145, at *13.

173. *See* Peskoe, *supra* note 28, at 20.

transactions are not preempted."[174] Similarly, in Illinois, the court held that "sales of ZECs are unbundled" from wholesale sales and are not preempted.[175]

Recommendations for Pricing Carbon Dioxide Emissions in NYISO

In New York, considering a different approach to carbon pricing other than subsidies (e.g., mandatory ZEC procurement under the CES), a uniform standard for applying prices for avoided carbon dioxide emissions could provide more economically efficient outcomes since this mechanism would reward other similar socially beneficial energy generators.[176] Similar to the carbon pricing framework by PJM, a recent report prepared for NYISO concludes that "a carbon charge would be a straightforward and economically efficient way to harmonize New York's environmental goals and the wholesale market design by pricing the environmental externality associated with carbon emissions directly."[177] A NYISO regional carbon adder could potentially enhance competition aimed at achieving the alleged goals of the ZEC (i.e., environmental benefits).[178] A carbon adder would impose additional costs per ton of carbon dioxide generated, increasing the cost of transacting in wholesale markets for carbon-emitting electricity generation source. Although New York already participates in the Regional Greenhouse Gas Initiative (RGGI), which is a mandatory market-based emissions trading program, "[h]igher carbon prices [through a regional carbon adder] would provide a stronger market signal than current RGGI prices and reward efficiency improvements across the fossil fleet, incentivize conservation and energy efficiency, encourage storage and other technologies that can reduce emissions . . . ."[179] The report notes that "CES procurement of RECs and ZECs does not invite competition as broadly as carbon pricing would since it targets specific resource types and amounts dependent on solicitations from [NYSERDA]."[180] Alternatively, the carbon price approach would require that "carbon-emitting generation . . . pay a uniform price on the amount of carbon they emit for each unit of energy they produce, raising their variable energy costs," thus providing carbon-free generation sources an advantage since they would not bear

174. *See supra* note 125 at *563.
175. *See supra* note 145 at *13.
176. *See* Gundlach & Webb, *supra* note 79, at 42-43.
177. Samuel A. Newell et al., *Pricing Carbon into NYISO's Wholesale Energy Market to Support New York's Decarbonization Goals*, 7, THE BRATTLE GROUP (Aug. 10, 2017), http://www.nyiso.com/public/webdocs/markets_operations/documents/Studies_and_Reports/Studies/Market_Studies/Pricing_Carbon_into_NYISOs_Wholesale_Energy_Market.pdf [https://perma.cc/62YX-QVPR].
178. *See* Gundlach & Romany Webb, *supra* note 79 at 48.
179. Samuel A. Newell et al., *supra* note 177 at v.
180. *Id.* at 14.

such cost burdens.[181] Such a proposal would integrate a uniform price signal in these wholesale markets and maintain economic principals aimed at incentivizing low-cost, carbon-free generation.

NYISO can price carbon in one of two ways: (1) apply a price per ton of carbon emitted in its energy marketplace or (2) implement a cap-and-trade scheme by setting a maximum allowable emissions target (i.e., a "cap") and administrating auctions for carbon-generating sources to purchase and trade these allowable emissions.[182] In the first approach, NYISO would add a carbon charge to each carbon-generating source's market transactions based on each generator's carbon emission rate.[183] The market structure would then incentivize lowest-cost emission generation to enter and compete in the market (e.g., nuclear plants would receive an economic advantage over gas and coal plants in selling their generated electricity in the market). Cap-and-trade programs, however, would likely pose "a greater administrative burden [for design, operation, and compliance] than a carbon price administered by the NYISO."[184] A carbon price adder also poses significant challenges, including the determination of an appropriate price, appropriate allocation of collected carbon funds to customers, and prevention of emissions leakage to neighboring energy markets.[185] In summary, a carbon charge "would send granular price signals on carbon costs to the entire market, penalizing high-emitting resources and rewarding low-emitting ones . . . [and] would improve the economic efficiency of meeting the state's energy and environmental goals."[186]

In California, "FERC has approved a California Independent System Operator (CAISO) tariff that incorporates the costs of allowances for that state's economy-wide CO2 cap-and-trade program."[187] FERC has allowed cap-and-trade programs and related allowance costs to meet the just and reasonable standard since the 1990s.[188] As a result, states can incorporate costs of meeting cap-and-trade requirements in their wholesale energy

181. *Id.*
182. *Id.* at 18–19.
183. *Id.* at 19.
184. *Id*. at 20.
185. *Id*. at 2223 (Determining a carbon price must be modified over time and can reflect working group determinations of the social cost of carbon or at a price intended to achieve the states decarbonization targets. Charging for a price of carbon would result in a sizeable fund that can be used to mitigate the costs to consumers of increased LMPs throughout the wholesale marketplace. Applying localized carbon pricing to reduce local emissions can result in other states participating in the RGGI to increase their emissions and meet RGGI allowances.).
186. *Id*. at 6162.
187. Ari Peskoe, *Easing Jurisdictional Tensions by Integrating Public Policy in Wholesale Electricity Markets*, 38 ENERGY L.J. 1, 31 (2017).
188. *Id.*

transactions. California and CAISO have been successful in increasing carbon-free energy procurement while planning nuclear power plant closures, conforming to a rapidly changing energy sector and policy demands.[189]

PJM Proposals for Addressing State Actions Affecting Wholesale Power Markets

PJM recognizes challenges that state policies can pose to wholesale energy markets within its territory and has also proposed a carbon-pricing framework along with two other proposals that are beyond the scope of this note.[190] PJM has noted that "[s]tate actions take the form of subsidies or out-of-market economic support that currently impedes formation of competitive prices in PJM Interconnection's capacity and energy markets."[191] Given the impacts of a direct subsidy to in-state electricity generators bidding into federally-regulated regional markets that do not provide similar subsidies, PJM has explored an alternative solution that balances the goals of maintaining the correct price signal to incentivize and maintain the competitive entry necessary to achieve long-term resource adequacy while also committing only the quantity of capacity necessary in any given delivery year.[192]

Specifically, PJM proposes a carbon pricing framework that can be adopted in wholesale markets that would (1) establish a price per ton of carbon emissions, (2) apply to carbon-emitting suppliers on a per-ton basis and be reflected in offers, (3) be revealed in wholesale market prices in the participating region or sub-region, and (4) improve the relative competitiveness of lower-emitting resources, including those that do not emit carbon.[193] Implementing a carbon pricing framework, which FERC has concluded would be within PJM authority, would establish a competitive landscape in which low-carbon or carbon-free energy generation sources are rewarded for the attributes they provide to society through the market uniformly. ZECs and RECS are arguably uniform in

189. Eric Gimon, *A Guide to the Debate Over Closing Nuclear Plants*, GREENTECH MEDIA (Mar. 6, 2017), https://www.greentechmedia.com/articles/read/a-survivors-guide-to-the-debate-over-existing-nuclear-plants [https://perma.cc/D8TL-TBQV].

190. *Context for PJM Market Design Proposals Responding to State Public Policy Initiatives*, at 1-2, PJM, http://www.pjm.com/~/media/library/reports-notices/special-reports/20170612-context-for-pjm-market-design-proposals-responding-to-state-public-policy-initiatives.ashx [https://perma.cc/4VZ4-9Y75].

191. *Id*. at 1.

192. *See* Bresler, *supra* note 162.

193. *Advancing Zero Emissions Objectives through PJM's Energy Markets: A Review of Carbon-Pricing Frameworks*, at 1, PJM (August 23, 2017), http://pjm.com/~/media/library/reports-notices/special-reports/20170502-advancing-zero-emission-objectives-through-pjms-energy-markets.ashx [https://perma.cc/JF3T-3NMB].

their application in that they recognize and reward various carbon-free energy generation attributes. However, as discussed above, a carbon pricing scheme implemented at the regional level would unite these two concepts, allow for better coordination of state climate change goals, and retain faith in regional power markets by establishing uniform prices and tariffs. RTOs/ISOs will have to carefully assess how to best implement carbon-pricing within their regions given existing state policies that impact wholesale power markets. While the ZEC program and Illinois' FEJA have survived challenges in federal district and appellate courts[194], FERC, PJM, and NYISO are actively considering proposals for carbon-pricing and other structural market changes within those regions.

CONCLUSION

U.S. wholesale power markets are currently facing the most significant challenges to their structure and operation in decades. Competition in electricity markets has increased investment in the energy sector and incentivized innovation that avoids the environmental harms of greenhouse gas emissions from the electricity sector. Along with the industry, private ownership of power generation sources in the United States has grown, and in local economies, retirement of power plants can have disproportionate impacts. FERC, regional commissions, state legislatures, and industry stakeholders should collaborate to propose solutions for managing existing electricity loads and ensuring economically efficient outcomes. Twenty-first century energy technologies and differing state climate change policies demand that FERC allow states to incentivize targeted energy generation through subsidies or otherwise while refraining from endorsing anticompetitive market principles.

194. *See generally*, Coalition for Competitive Electricity, et al. v. Zibelman, et al., 906 F.3d 41 (2d Cir. 2018); *see generally* Electric Power Supply Assoc. et al. v. Anthony M. Star et al., 904 F.3d 518 (7th Cir. 2018).

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