Pace Environmental Law Review

Volume 34
Issue 1 *Fall 2016*

Article 4

September 2016

Dual Environmentalism: Demand Response Mechanisms in Wholesale and Retail Energy Markets

Sarah M. Main
Elisabeth Haub School of Law at Pace University, smain@law.pace.edu

Recommended Citation
Sarah M. Main, *Dual Environmentalism: Demand Response Mechanisms in Wholesale and Retail Energy Markets*, 34 Pace Envtl. L. Rev. 165 (2016)
DOI: https://doi.org/10.58948/0738-6206.1801
Available at: https://digitalcommons.pace.edu/pelr/vol34/iss1/4

NOTE

Dual Environmentalism: Demand Response Mechanisms in Wholesale and Retail Energy Markets

SARAH M. MAIN*

I. INTRODUCTION

Electricity production is the collectively most carbon-intensive process on the planet.[1] The predominant use of fossil fuels to meet growing electricity demand makes electric power generation a key contributor to global carbon emissions.[2] In 2015, fossil fuel-powered generators produced 67 percent of United States electricity demand and contributed to 37 percent of the country's carbon emissions – more than any other economic sector.[3] As the

* Sarah M. Main is a third-year J.D. and Environmental Law Certificate candidate at the Elisabeth Haub School of Law at Pace University. She received a Bachelor of Arts, summa cum laude, in Environmental Studies and Political Science with honors from Saint Michael's College in 2013. She is a member of Phi Beta Kappa, Delta Epsilon Sigma, and Pi Sigma Alpha national academic honor societies. She has focused her studies on renewable and alternative energy transitions, government policy, and international climate initiatives. The author would like to thank John Bowie for sparking her interest in the subject matter, Noah Shaw for prompting her to think about the subject matter in different contexts, and the Pace Environmental Law Review for entertaining her musings on the subject matter.

1. *Global Greenhouse Gas Emissions Data,* EPA, http://www3.epa.gov/climatechange/ghgemissions/global.html [https://perma.cc/76XZ-7XZ5] (last updated Aug. 9, 2016).

2. *Sources of Greenhouse Gas Emissions,* EPA, http://www3.epa.gov/climatechange/ghgemissions/sources/electricity.html [https://perma.cc/Z4RP-WT29] (last updated Oct. 6, 2016).

3. U.S. Energy Info. Admin., *What Is U.S. Electricity Generation by Energy Source?*, EIA, https://www.eia.gov/tools/faqs/faq.cfm?id=427&t=3 [https://

primary driver of global climate change, atmospheric carbon dioxide is the most detrimental consequence of turning on the lights.[4] In addition to the alarming amount of carbon dioxide emitted from this single, essential process, methane and nitrous oxide are also released, exacerbating the heat-trapping potential of the atmosphere.[5] With the United States' energy-related carbon dioxide emissions rising 1 percent each year, major electric power industry reforms are necessary to mitigate widespread, adverse, environmental impacts and avoid catastrophic climate change.[6]

Carbon dioxide is emitted in electricity production when fossil fuel-fired generators burn coal, oil, and natural gas to release heat energy.[7] Before the combustion of carbon-dense fossil fuels even occurs, the processes by which these resources are mined and extracted creates an additional, massive environmental impact.[8]

perma.cc/WX94-FKU9] (last updated Apr. 1, 2016); U.S. Energy Info. Admin., *How Much of U.S. Carbon Dioxide Emissions are Associated with Electricity Generation?*, EIA, [https://perma.cc/KJD5-AY7X] (last updated Apr. 1, 2016). Agriculture, forestry, and other land uses came in close second for global carbon emissions, at 24%. *Global Greenhouse Gas Emissions Data*, *supra* note 1. In 2014, the generation of electricity accounted for 25 percent of all global carbon emissions. *Id*. Data for 2013-2014 is based on the IPCC's 2014 global emissions report, using emissions data from 2010. *Id.*; *Understanding the IPCC Reports*, WORLD RES. INST., http://www.wri.org/ipcc-infographics [https://perma.cc/3MVG-P6L6].

4. *Why Does CO2 Get Most of the Attention When There Are So Many Other Heat Trapping Gases (Greenhouse Gases)?*, UNION OF CONCERNED SCIENTISTS, http://www.ucsusa.org/global_warming/science_and_impacts/science/CO2-and-global-warming-faq.html#.VtzNTJMrKHo [https://perma.cc/R2C8-ZLB4].

5. *Global Greenhouse Gas Emissions Data*, *supra* note 1.

6. *Understanding the IPCC Reports*, *supra* note 3; SUSAN JOY HASSOL, PRESIDENTIAL CLIMATE ACTION PROJECT, QUESTIONS AND ANSWERS: EMISSIONS REDUCTIONS NEEDED TO STABILIZE CLIMATE (2007), https://www.climatecommunication.org/wp-content/uploads/2011/08/presidentialaction.pdf [https://perma.cc/4LD7-4Y69].

7. *CO2 Emissions Associated with Biomass Use at Stationary Sources*, EPA, https://www3.epa.gov/climatechange/ghgemissions/biogenicemissions.html [https://perma.cc/X5TX-U4MN] (last updated Sept. 26, 2016). Carbon dioxide is also emitted in the burning of biomass fuels, like biogas and wood; however, the carbon dioxide released from biomass is considered biogenic carbon. *Id.* Biogenic carbon dioxide is associated with the natural carbon cycle. *Id.* Forest-derived and agriculture-derived fuels sequester carbon from the atmosphere during photosynthesis. *Id.* When burned, these fuels release the carbon dioxide that, unlike coal, oil, and natural gas, was originally removed from the natural carbon cycle. *Id.*

8. Nathalie Butt & Hawthorne Beyer, *Leave It in the Ground! How Fossil Fuel Extraction Affects Biodiversity*, CONVERSATION (Oct. 24, 2013, 3:44 PM),

The extraction and combustion processes significantly contribute to global climate change long before the transmission, distribution, and often wasteful consumption of electricity takes place.

Despite growth in the renewable energy sector, non-renewable fossil fuels are the primary fuel source in the United States and around the world.[9] The type of fuel used in energy production – whether natural gas, coal, wind, or solar – can affect the carbon footprint of the entire grid operation.[10] However, fuel source is only one factor in the environmental impact equation. Aging infrastructure throughout the United States has made the transmission and distribution of electricity less efficient and unreliable.[11] Upgrading infrastructure and moving generation closer to the source of consumption requires hefty investments and is associated with its own slew of negative environmental impacts.[12] Thus, a key approach to mitigating climate change

http://theconversation.com/leave-it-in-the-ground-how-fossil-fuel-extraction-affects-biodiversity-19484 [https://perma.cc/Y49X-5UMQ]. The extraction of fossil fuels is associated with potential environmental hazards, including habitat destruction and fragmentation which threaten biodiversity, the production of toxic wastes and heavy metals which pollute flora and fauna habitats and contaminate groundwater, noise and air pollution which affect human and animal species alike, land subsidence, alterations in the water table, and facilitation of invasive species and pathogens, among other direct and indirect environmental harms. *Id.*

9. *Energy and Global Warming*, CTR. FOR BIOLOGICAL DIVERSITY, http://www.biologicaldiversity.org/programs/climate_law_institute/energy_and_global_warming/ [https://perma.cc/R79F-UAM9]; *see* WORLD ENERGY COUNCIL, WORLD ENERGY RESOURCES: 2013 SURVEY 6 (2013), https://www.worldenergy.org/wpcontent/uploads/2013/09/Complete_WER_2013_Survey.pdf [https://perma.cc/DR3T-E7RR].

10. *See* WORLD ENERGY COUNCIL, *supra* note 9, at 4.

11. *See* ALISON SILVERSTEIN, TRANSMISSION 101: NCEP TRANSMISSION TECHNOLOGIES WORKSHOP 25-26 (2011), http://www.ncsl.org/documents/energy/ASilverstein4-20-11.pdf [https://perma.cc/NGF6-8WHH].

12. *See id.* at 17-26. This note does not address technical advancements to electric grid infrastructure that could improve the efficiency of electricity transport and distribution. While a large amount of energy is lost in transmission and distribution (6% in 2014), this note focuses primarily on the role of demand response in mitigating the adverse environmental impacts of the electric power industry. U.S. Energy Info. Admin, *How Much Energy is Lost in Transmission and Distribution in the United States?,* EIA, https://www.eia.gov/tools/faqs/faq.cfm?id=105&t=3 [https://perma.cc/SM5G-W6RJ] (last updated Apr. 6, 2016). As of the writing of this note, the United States is actively studying ways to modernize the electric grid. The Department of Energy anticipates that "in the next two decades, large transmission and distribution investments will be made

effects, and internalizing the environmental externalities associated with electricity production and consumption, is to alter the way end-use customers consume electricity.[13]

Reducing consumption can shape market preferences for fuel sources, promoting renewable and cleaner-burning fuels over costly fossil fuel resources.[14] Prior to the Supreme Court's decision in *Federal Energy Regulatory Commission v. Electric Power Supply Association*, wholesale energy market conditions did not give retail customers a clear incentive to cut consumption.[15] To incentivize energy conservation in the interim, state and federal entities implemented programs to motivate change in electricity consumption.[16] Demand response is one such mechanism.

to replace aging infrastructure; maintain reliability; enable market efficiencies; and aid in meeting policy objectives, such as greenhouse gas reduction and state renewable energy goals." U.S. DEP'T OF ENERGY, QUADRENNIAL ENERGY REPORT: ENERGY TRANSMISSION, STORAGE, AND DISTRIBUTION INFRASTRUCTURE (2015), http://energy.gov/sites/prod/files/2015/04/f22/QER-ALL%20FINAL_0.pdf [https://perma.cc/92YA-8764].

13. *See* David Nemtzow et al., *The Green Effect*, PUB. UTIL. FORT., Mar. 2007, at 42, https://www.scc.virginia.gov/pue/conserve/c_2/cn_consdem_0307.pdf [https://perma.cc/BG46-VALW].

14. *See generally id.* at 42 (discussing studies that reveal customer responses to feedback on electricity consumption)*;* TOM OVERBYE ET AL., POWER SYSTEMS ENGINEERING RESEARCH CENTER, THE ELECTRIC POWER INDUSTRY AND CLIMATE CHANGE: POWER SYSTEMS RESEARCH POSSIBILITIES 33-35 (2007), http://pserc.wisc.edu/documents/. . ./2007. . ./M-19_Final-Report_June-2007.pdf [https://perma.cc/C38Y-SCG5]. While the cost of oil per kilowatt hour may be lower for the end-use customer than a kilowatt of wind- powered electricity, "costly" here considers the externality costs of both renewable and non-renewable resources, making non-renewables costlier than renewable alternatives. *See* Dana Nuccitelli, *Fossil Fuels are Way More Expensive Than You Think*, GUARDIAN (Mar. 15, 2015, 9:00 AM), http://www.theguardian.com/environment/climate-consensus-97-per-cent/2015/mar/18/fossil-fuels-are-way-more-expensive-than-you-think [https://perma.cc/G7GC-YQ7B].

15. FERC v. Elec. Power Supply Ass'n, 136 S. Ct. 760 (2016); STEVEN D. BRAITHWAIT ET AL., THE ROLE OF DEMAND RESPONSE IN ELECTRIC POWER MARKET DESIGN 5 (2002) [https://perma.cc/9FPG-TNWZ].

16. For a state-level programs, see New York's retail demand response initiatives. William Opalka, *Demand Response for All Coming to New York*, RTO INSIDER (June 22, 2015), http://www.rtoinsider.com/new-york-demand-response-15883 [https://perma.cc/5UY7-4LCM]. For a federal assessment of demand response programs, see FED. ENERGY REG. COMM'N, ASSESSMENT OF DEMAND RESPONSE AND ADVANCED METERING 5 (2014), https://www.ferc.gov/legal/staff-reports/2014/demand-response.pdf [https://perma.cc/6N2D-Q2ZR].

Demand response programs exist in both wholesale and retail energy markets.[17] Demand response may take the form of financial incentives to lower electricity consumption during peak demand periods, or permission for retail customers to bid reductions in use into the wholesale market at specified prices.[18] Because demand response has numerous environmental and economic benefits,[19] its potential to shape environmentally-conscious energy regulation is promising. Despite the clear potential of demand response in mitigating climate change and environmental degradation, the direct impact of demand response on the environment has been largely unexplored.[20] Both wholesale and retail demand response programs aim to shape the consumption behaviors of end-use customers, and thus, the environmental benefits associated with demand response are specific to the location of the consumer.[21] For these reasons, states and local entities may be better suited to design environmentally conscious demand response programs than a federal oversight agency. Nevertheless, federal regulation is needed to obtain environmental benefits, even locally.

In the 2016 case of *Federal Energy Regulatory Commission* ("FERC") *v. Electric Power Supply Association* ("EPSA"), the Supreme Court was faced with determining FERC's authority over demand response markets.[22] FERC is an independent government agency created within the Department of Energy to ensure the protection of energy consumers and the public by monitoring the

17. U.S. Dep't of Energy, *Demand Response*, ENERGY.GOV, http://energy.gov/oe/technology-development/smart-grid/demand-response [https://perma.cc/8PDE-C3LX].

18. BRAITHWAIT ET AL., *supra* note 15, at 3.

19. *Id.* at 5. To name a few environmental benefits associated with demand response, reduced consumption during peak hours can diminish the need to dispatch polluting gas generators, thereby reducing carbon emissions; alleviate constraints in generation and transmission that result in energy lost in the form of heat, making the grid more efficient and reliable, which is associated with numerous environmental benefits; decrease overall demand for electricity, negating pressure to build costly, polluting, fossil-fueled power plants. *Id.*

20. *See* Nemtzow et al., *supra* note 13, at 41.

21. *See id.*

22. *See* FERC v. Elec. Power Supply Ass'n, 136 S. Ct. 760 (2016); Robert Walton, *Updated: Supreme Court Hears Arguments Over FERC Demand Response Rule*, UTILITY DIVE (Oct. 14, 2015), http://www.utilitydive.com/news/updated-supreme-court-hears-arguments-over-ferc-demand-responserule/407293 [https://perma.cc/LT6M-9MFA].

legality of regulated energy companies.[23] The issue raised questions about the division of power between the state and federal government over electricity markets.[24] The Court ultimately ruled that FERC was within its jurisdiction when it used its rulemaking authority to allow retail demand response providers to sell into the wholesale market.[25] FERC was also acting within its jurisdiction by requiring that retail providers be paid for demand response at the same price as wholesale generators.[26] Despite initial concerns over separation of powers, the Supreme Court's ruling provides room for states to play an integral part in the development and deployment of an environmental regulatory scheme. *FERC v. EPSA* and combined challenges set important precedent for the future of demand response and the permissible degree of federal oversight.[27]

This note argues that a dual jurisdictional approach to demand response programming is better suited to mitigate environmental harms than an "either-or" regulatory model.[28] Through an exploration of FERC's authority over wholesale demand response, state authority over retail-level demand response, and implications for electricity and capacity markets arising out of the Court's decision in *FERC v. EPSA*, this note will offer effective legal mechanisms for mitigating environmental costs, while fostering environmental benefits. The next section of this note analyzes the strengths and weaknesses of state and federal regulatory approaches to demand response in isolation.

23. *What Is FERC?*, FED. ENERGY REG. COMM'N, http://www.ferc.gov/students/whatisferc.asp [https://perma.cc/MFS9-X2DE]. FERC's responsibilities include "regulating the interstate transmission of natural gas, oil, and electricity; regulating the wholesale sale of electricity (individual states regulate retail sales); . . .monitoring and investigating energy markets" and other wholesale market oversight, the siting of applications for electric transmission, and ensuring the reliability of the electric grid. *Id.*

24. Walton, *supra* note 22.

25. *EPSA*, 136 S. Ct. at 784.

26. *Id.*

27. *See id*. *FERC v. Electric Power Supply Ass'n*, No. 14-840 (U.S. Jan. 25, 2016) was combined with *EnerNoc, Inc. v. Electric Power Supply Ass'n*, No. 14-841 (U.S. Jan. 25, 2016) (together commonly referred to as *EPSA II)* upon a granting of certiorari.

28. That is, as EPSA argued in support of, a state or federal approach with clear distinctions between the bounds of state jurisdiction in retail markets and FERC jurisdiction over wholesale markets.

Based on this assessment, this note suggests the policy mechanisms most conducive to environmentally-conscious electric energy regulation. This note concludes with a model regulatory scheme that utilizes demand response to mitigate global climate change and advance environmental sustainability.

II. BACKGROUND ON WHOLESALE AND RETAIL ENERGY AND CAPACITY MARKETS

An introduction to wholesale and retail market structures is necessary to understand the jurisdictional implications arising out of *FERC v. EPSA*. In each market, numerous players are involved in the procurement, management, regulation, and sale of electricity. These players have varying degrees of authority, each occupying a niche role in the market. The division of power between these wholesale and retail entities, and the extent to which they can be regulated by oversight agencies, should be considered in incorporating demand response into an environmental regulatory scheme. "Enlightened regulators will escape from zero-sum, 'federal vs. state' mindsets, instead focusing on which regulatory actors are best positioned to make which decisions."[29]

The electricity market is made up of wholesale and retail market components.[30] The wholesale market comprises the supply-side of the electricity market, beginning with the conversion of fuel to energy and energy to electricity, and the subsequent distribution of that electricity from power providers to electric utilities.[31] Wholesale power exists at the high-voltage points in the electric system, before the electricity flowing through transmission wires is stepped down to lower voltages for

29. Scott Hempling, *The Supreme Court Saves Demand Response: Now What?*, SCOTT HEMPLING LAW (Feb. 2016), http://www.scotthemplinglaw.com/essays/the-supreme-court-saves-demand-response [https://perma.cc/9TWU-B26Z].

30. FED. ENERGY REG. COMM'N, ENERGY PRIMER: A HANDBOOK OF ENERGY MARKET BASICS 35 (2015), http://www.ferc.gov/market-oversight/guide/energy-primer.pdf [https://perma.cc/8AKM-EA9R].

31. N.Y. Indep. Sys. Operator, *Understanding the Markets*, NYISO, http://www.nyiso.com/public/about_nyiso/understanding_the_markets/wholesale_retail/index.jsp [https://perma.cc/U8RD-72Z2].

consumption.[32] Wholesale power begins at the generator – typically a coal or natural gas-fired power plant – where fossil fuel combustion produces steam that is converted into electricity.[33] The electricity is then powered up to high voltages to send over long-distance transmission lines.[34] The electricity enters the retail market when transformers step it down to low voltages for consumption.[35]

The wholesale electricity market involves the sale of electricity amongst generators and owners of transmission, as well as electric utilities and traders.[36] FERC has jurisdiction over wholesale energy markets, which cross state lines and sell electricity in interstate commerce.[37] The wholesale market is divided into three regions of multi-state interconnections – the Western Interconnection, Eastern Interconnection, and Electric Reliability Council of Texas Interconnection.[38] Within these interconnections, Regional Transmission Operators ("RTOs") and Independent System Operators ("ISOs") manage transmission and engage in the interstate sale of electricity on a regional basis.[39] Each of these wholesale market operators administers a portion of the country's electric grid and provides generators access to transmission infrastructure.[40] FERC dictates the wholesale prices for electricity, and may choose to base that determination on either the market price of energy, or the costs of generation and transmission.[41]

The retail market comprises the demand side of the electric system, or the sale of electricity to customers.[42] Retail power companies, such as electric utilities and energy service providers, purchase power through their ISO's or RTO's regional wholesale

32. *Id.*
33. *Id.*
34. *Id.*
35. *Id.*
36. *What is FERC?, supra* note 23, at 35.
37. *Electricity Primer- The Basics of Power and Competitive Markets*, ELEC. POWER SUPPLY ASS'N, https://www.epsa.org/industry/primer/?fa=wholesaleMarket [https://perma.cc/CYL9-RJ2Q].
38. *Id.*
39. *Id.*
40. FERC v. Elec. Power Supply Ass'n, 136 S. Ct. 760, 768 (2016).
41. *See* FED. ENERGY REG. COMM'N, *supra* note 30.
42. *See id.*

market.[43] This power is generated and transmitted in the wholesale market.[44] When the power reaches transformers at the customer end of the electric grid, it is stepped down to low voltage.[45] After being distributed to local power lines across a series of switchboards, the electricity reaches the end-use customer, who pays the retail price for their consumption.[46]

In the retail market, electric utility companies and energy service companies ("ESCOs") sell power to individuals, businesses, and other end-use customers.[47] Utilities are subject to the jurisdiction of the state public service commission or public utility commission, and are typically granted an exclusive service territory in exchange for providing services to customers.[48] Distribution utilities or electric utilities with this service obligation are called Load Serving Entities ("LSEs"), due to their role in supplying load, or electricity, to customers.[49]

Various categories of customers exist within a service territory, such as commercial, residential, and industrial customers.[50] The customer's electric rate is based on the category in which the customer falls.[51] The utility has a number of rate

43. N.Y. Indep. Sys. Operator, *supra* note 31.

44. *Id.*

45. *Id.*

46. *Id.*

47. Colin Fitzsimmons, *What is the Role of the Utility vs. Retail Energy Provider?*, DIRECT ENERGY BUS. (May 18, 2015), https://www.business.directenergy.com/blog/2015/may/what-is-the-role-of-the-utility-versus-a-retail-energy-provider [https://perma.cc/S8ZZ-NF5F]. ESCOs are commercial or non-profit businesses that provide a range of energy solutions, including the development, design, construction, and funding of projects that save energy, reduce energy costs, and reduce operational and maintenance costs for customer facilities. U.S. Dep't of Energy, *Energy Service Companies*, ENERGY.GOV, http://energy.gov/eere/femp/energy-service-companies-0 [https://perma.cc/U5AN-K7Z7]. Unlike other entities that offer energy efficiency improvements, such as retrofits and risk management, ESCOs use performance-based contracting methodology to implement its projects, thereby directly linking a company's compensation to actual energy cost savings. *Id.*

48. In New York for example, electric utilities are given a mostly exclusive service territory in exchange for providing "just and reasonable" rates to customers. *See* N.Y. COMP. CODES R. & REGS. tit. 16, § 61.2 (2016).

49. Federal Power Act § 217, 16 U.S.C. § 824q(a)(2)-(3) (2012).

50. Fitzsimmons, *supra* note 47.

51. Joshua M. Pearce & Paul J. Harris, *Reducing Greenhouse Gas Emissions by Inducing Energy Conservation and Distributed Generation from Elimination of Electric Utility Customer Charges*, 35 ENERGY POL'Y 6514, 6514-15 (2007).

schedules, known as tariffs, that dictate the price of electricity for the particular type of customer.[52] These tariffs reflect the customer's demand, while allowing the utility to make a reasonable return on investment.[53]

While wholesale and retail energy markets engage in the procurement, pricing, and sale of electricity as a fungible commodity, capacity markets engage future investments for energy demand.[54] Capacity is "the capability of generation or other resources to meet demand; the ability to produce energy, not the energy itself."[55] Capacity is vital to the reliability of the electric grid and the ability of LSEs to meet future projected demand.[56] Every LSE on the grid must balance energy resources with load, or demand, at all times to avoid an imbalance in the flow of electrons throughout the grid.[57] Such destabilization could result in power outages for customers in the region, even those customers who receive energy from a different LSE.[58] Capacity ensures that the electric utility or supplier has adequate resources to meet customer demand plus a reserve amount to account for contingencies in the grid.[59] Suppliers can meet their capacity requirements with

52. BRAITHWAIT ET AL., *supra* note 15, at 14.

53. Pearce & Harris, *supra* note 51, at 6524.

54. *Capacity Market (RPM)*, PJM LEARNING CENTER, https://learn.pjm.com/three-priorities/buying-and-selling-energy/capacity-markets.aspx [https://perma.cc/GV75-QC9Q].

55. Jay Morrison, *Capacity Markets: A Path Back to Resource Adequacy*, 37 ENERGY L.J. 1, 4 n.5 (2016).

56. *Capacity Markets*, DIRECT ENERGY BUS., https://business.directenergy.com/understanding-energy/managing-energy-costs/deregulation-and-energy-pricing/capacity-markets [https://perma.cc/E9AQ-HRGV].

57. Morrison, *supra* note 55, at 3.

58. *Id.*

59. *Capacity Markets*, *supra* note 56. Contingencies in the grid cause demand to spike above historical levels, and can cause major losses in transmission or generation resources with little to no notice to the grid operator. Morrison, *supra* note 55, at 3-4. Contingencies include unplanned grid trips, or disconnects, of large generators or transmissions lines that cause imbalances in the electric grid. *Id.*; *see, e.g.*, ERIC HIRST, PRICE-RESPONSIVE DEMAND AS RELIABILITY RESOURCES 4 (2002), http://www.ksg.harvard.edu/hepg/Papers/Hirst_PRDReliability_04-02.pdf [https://perma.cc/AS8R-ZNA5]. Accordingly, the grid must have access to 9-20% more capacity than the anticipated peak demand, as based on historical forecasts, to meet demand in the event of contingencies. Morrison, *supra* note 55 at 3-4.

generation capacity they own, with capacity purchased from other providers, or with capacity obtained through market auctions.[60]

Power generators are compensated for capacity, or the power they will provide at some point in the future.[61] RTOs and ISOs, who manage capacity markets in their respective regions, pay generators for their available capacity, independent of energy costs.[62] RTO and ISO payments come from the sale of capacity to LSEs at auction.[63] LSEs purchase the amount of capacity necessary to meet the customer loads they serve within their RTO/ISO region.[64] In capacity auctions, "there is no functional difference between a megawatt of power from a power plant and a megawatt of reduced power from efficiency or demand response."[65] In other words, both energy resources (such as wind turbines, coal-fired power plants, and other energy generators) and efficiency resources (measures that reduce the amount of an energy resource needed to meet demand) bid capacity into the market at the cost of operation.[66]

Wholesale market operators (i.e. ISOs and RTOs) offer demand response programs in both wholesale energy and capacity markets.[67] Likewise, FERC may institute demand response policies applicable to all wholesale entities subject to its jurisdiction.[68] Utilities and other LSEs may also implement demand response programs in retail markets, resulting in on-bill reductions in the price of electricity for their customers.[69] Demand response programs function through ISO and RTO auctions.[70] At auction, aggregators of electricity customers and large-load

60. *Capacity Markets*, *supra* note 56.

61. Adam Jones, Opinion, *Explainer: How Capacity Markets Work*, MIDWEST ENERGY NEWS (June 17, 2013), http://midwestenergynews.com/2013/06/17/explainer-how-capacity-markets-work [https://perma.cc/MRG8-FZTJ].

62. *Capacity Markets*, *supra* note 56.

63. *Id.*

64. *Id.*

65. Jones, *supra* note 61.

66. *Id.*

67. *See* BRAITHWAIT ET AL., *supra* note 15, at 28.

68. *Id.* at 42.

69. *See, e.g.*, *Demand Response Program Options*, PAC. GAS & ELEC. CO., http://www.pge.com/en/mybusiness/save/energymanagement/index.page?WT.mc_id=Vanity_demandresponse [https://perma.cc/9XRG-PGGJ].

70. FERC v. Elec. Power Supply Ass'n, 136 S. Ct. 760, 770 (2016).

individual users submit bids to decrease electricity consumption by a certain amount of MWs, at a set price, for a set period of time.[71] Wholesale market operators treat these demand response bids like supply offers from generators.[72] Operators then rank all the bids received from the least to most expensive in what is referred to as a "bid stack."[73] Winning bids receive the wholesale market price for their contributions, which is equivalent to the Locational Marginal Price ("LMP"). In economic principles, the LMP represents the added cost of meeting another unit of demand, which is the price an efficient market would produce.[74]

Bids for efficiency resources in the capacity market, like demand response, have the ability to lower the market clearing price and displace more costly generators.[75] For instance, a generator bidding 100 megawatts ("MW") of demand response into the capacity market at $150 per MW asserts that, for the future period of time covered by the auction, it will curtail 100 MW of demand rather than generating 100 MW to meet demand.[76] If the 100 MW of demand response, when added to the bid stack, is enough to meet regional demand, the market clearing price is set at $150 per MW, as no other resources would be needed to serve forecasted load. If a peaking coal-fired power plant had bid 100 MW into the market $160 per MW, the demand response bid would displace the coal generator. All resources that bid in under $150

71. *Id.*

72. *Id.*

73. *Id.*

74. *Market Equilibrium,* ECONS. ONLINE, http://www.economicsonline.co.uk/Competitive_markets/Market_equilibrium.html [https://perma.cc/5J7R-C58U]. Efficient markets tend towards equilibrium. In wholesale electricity markets, when supply is balanced with demand in equipoise, the market is thought to have achieved economic equilibrium. *Market Equilibrium*, *supra* note 74. The market designates the price point at which supply equals demand, which varies on a regional basis, depending on the locational need of LSEs. *Id.*; *see EPSA*, 136 S. Ct. at 768-69.

75. *Market Equilibrium*, *supra* note 74. The clearing price is the price needed to "clear the market." In other words, the price all resources who bid into the market receive for their capacity commitments. *Id.* The price is set by the most expensive generator needed to meet demand. *Id.* When efficiency is bid into the market, less energy is needed to meet peak demand, reducing the amount of energy needed from costlier peaking generators, like coal plants, that often come in at the top of the bid stack. *Id.*

76. *Id.*

per MW clearing price would receive $150 per MW, even if, for example, a wind turbine bid into the market at $100 per MW.[77]

Prior to *FERC v. EPSA,* the division between wholesale and retail markets, and state and federal jurisdiction, was not clear in application to the country's interconnected electric grid. Market regulation invited challenges to the scope and breadth of state and federal jurisdiction, and raised complications in the realm of cooperative federalism.[78] Post-*FERC v. EPSA*, implementing the Supreme Court's holding in real time energy markets may be a more challenging task than wading through the Federal Power Act on paper. In fact, the Supreme Court's decision did not exactly clear the jurisdictional confusion. Retail markets strongly influence wholesale markets, and FERC jurisdiction over wholesale markets affects the sale of energy at retail levels.[79] To prevent circumscribing states' rights, the Court left one imperative question unanswered: whether demand response providers—in states that even *have* demand response programs to begin with – may sell *only* to retail utilities or may *also* (or instead) sell into wholesale markets.[80]

III. JUDICIAL PRECEDENT AND STATUTORY AUTHORITY

In the early twentieth century, the Supreme Court held that the Commerce Clause bars states from regulating "certain interstate electricity transactions, including wholesale sales (i.e. sales for resale) across state lines."[81] The ruling created a jurisdictional gap, referred to as the "Attleboro gap," that could only be filled with legislation.[82] Congress responded by passing the Federal Power Act in 1935.[83] The Federal Power Act ("FPA") confers jurisdiction on FERC to regulate wholesale electricity

77. *Id.* For additional examples of how capacity auctions function generally, see image entitled "How a Capacity Auction Works." Jones, *supra* note 61.

78. *See EPSA*, 136 S. Ct. at 770.

79. *See* FED. ENERGY REG. COMM'N, *supra* note 30, at 35.

80. Hempling, *supra* note 29.

81. *EPSA*, 136 S. Ct. at 767 (quoting *Pub. Util. Comm'n of R.I. v. Attleboro Steam & Elec. Co.*, 273 U.S. 83, 89-90 (1927)).

82. *Id.*

83. *Id.*

markets and reserves jurisdiction over all other electricity sales (i.e. retail sales) to states.[84] Specifically, the FPA charged FERC's predecessor agency with instituting "effective federal regulation of the expanding business of transmitting and selling electric power in interstate commerce."[85] Accordingly, FERC must oversee all prices associated with interstate transactions, as well as "all rules and regulations affecting or pertaining to such rates or charges," which must be "just and reasonable."[86] If any rate, charge, rule or regulation "affecting such rate [or] charge" fails to meet that standard, FERC must determine what is "just and reasonable" and "impose the same by order."[87]

The Energy Policy Act of 2005 declares it the policy of the United States that "demand response be encouraged," and mandates that unnecessary barriers to demand response participation in energy markets be eliminated.[88] To comply with this requirement, FERC issued rules to facilitate participation of demand-response providers in wholesale markets.[89] FERC Order 888, for instance, required wholesale market operators to permit retail electricity aggregators to bid demand response commitments directly into the wholesale market.[90] When FERC passed the final rule, no party sought judicial review of the rulemaking.[91]

Under the 2007 Energy Independence and Security Act, Congress instructed FERC to develop a national plan for demand

84. Brief for the Petitioner at 3-4, FERC v. Elec. Power Supply Ass'n, 136 S. Ct. 760 (2016) (No. 14-840).

85. *EPSA*, 136 S. Ct. at 767 (quoting *New York v. FERC*, 535 U.S. 1, 6 (2002)).

86. *Id.* (citing 16 U.S.C. § 824d(a) (2012)).

87. *Id.* (citing 16 U.S.C. § 824e(a) (2012)).

88. Brief for the Petitioner, *supra* note 84, at 9; *see EPSA,* 136 S. Ct. at 770 (citing 16 U.S.C. § 2642 (2005)).

89. Brief for the Petitioner, *supra* note 84, at 11.

90. Non-Discriminatory Open Access Transmission Tariff, 18 C.F.R. § 35.28 (2016) (commonly known as FERC Order 888). *See also* FERC Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities Rule, 18 C.F.R. § 35 (2016) (commonly known as FERC Order 1000). Both FERC Orders 888 and 1000 govern aspects of transmission that may have a relevant impact on federal demand response programs.

91. Brief for the Petitioner, *supra* note 84, at 11.

response.[92] FERC responded with rulemaking Order No. 745.[93] The rule amends prior FERC regulations mandated under the FPA to regulate demand response.[94] FERC invoked its authority to amend its regulations under the FPA provision that mandates FERC change "any rule, regulation, practice, or contract affecting such rate, change, or classification" that is "unjust, unreasonable, unduly discriminatory, or preferential."[95] The D.C. Circuit vacated Order No. 745 in its entirety on the grounds that FERC overstepped its jurisdiction into the realm of state control.[96] The court also found the rule's compensation scheme to be arbitrary and capricious under the Administrative Procedure Act ("APA").[97] The Supreme Court reversed and remanded for the D.C. Circuit Court to address a question left unanswered in its initial decision.[98]

A. FERC Order 745

In March 2011, FERC issued rulemaking Order 745, commonly referred to as the Demand Response Rule.[99] The rule regulates demand response in organized wholesale energy markets by establishing the price paid for demand response.[100] The rule

92. *Id.* at 9.

93. *See* Demand Response Compensation in Organized Wholesale Energy Markets, Order No. 745, 134 FERC ¶ 61,187 (March 15, 2011) [hereinafter FERC Order 745].

94. *Id.* For instance, FERC Order 719 required wholesale market operators to receive demand response bids from aggregators of electricity customers except where state retail authority barred participation in the market. FERC v. Elec. Power Supply Ass'n, 136 S. Ct. 760, 771 (2016).

95. 16 U.S.C. § 824e(a) (2012); *see* Brief for Petitioner, *supra* note 84, at 14.

96. *EPSA*, 136 S. Ct. at 763.

97. *Id.* In finding FERC's compensation scheme to be arbitrary and capricious, the D.C. Circuit arrived at an alternate holding that did not address the jurisdictional question. Recent Case, *Electric Power Supply Ass'n v. FERC: D.C. Circuit Rules that the Federal Energy Regulatory Commission Lacks Jurisdiction over Rates for Nonconsumption of Energy*, 128 HARV. L. REV. 1518, 1524 (2015).

98. David T. Doot et. al., *What's Next? Potential Impact of the Landmark Supreme Court Decision in FERC v. EPSA on Demand Response Across the Country*, DAY PITNEY LLP (Feb. 9, 2016), http://www.daypitney.com/insights/publications/2016/02/09-whats-next-potential-impact-of-ferc [https://perma.cc/4YUG-W8MK].

99. *See* FERC Order 745, *supra* note 93.

100. *Id.*

applies to RTOs or ISOs who conduct competitive auctions to set the wholesale price of electricity.[101] When an RTO or ISO has the option of engaging in demand response by balancing supply and demand, rather than dispatching additional generation, the rule requires that demand response providers receive the same compensation for conserving energy as generators would for producing energy.[102]

The rule is premised on the notion that a bid to provide electricity provides the same value to the wholesale market as a bid to generate more electricity, because each cost-effectively balances supply and demand.[103] To ensure demand response and supply bids provide the same value, the rule requires that demand response bids must meet two conditions: first, "a demand response bidder must have the capability to provide the service offered; it must, that is, actually be able to reduce electricity use and thereby obviate the operator's need to secure additional power."[104] Second, "paying LMP for a demand response bid must be cost effective, as measured by. . . the net-benefits test."[105] In exercising its rulemaking authority, FERC reasoned that the FPA grants jurisdiction over such bids because they "directly affect wholesale rates."[106] Likewise, the rule's approach for compensating customers for engaging in demand response "helps to ensure the competitiveness of the organized wholesale energy markets and remove[s] market barriers to the participation of demand response resources, thus ensuring just and reasonable rates" in accordance with statutory mandate.[107]

101. *Id.*

102. FERC v. Elec. Power Supply Ass'n, 136 S. Ct. 760, 767 (2016).

103. *Id.* at 771.

104. *Id.* (internal quotations omitted).

105. *See id.* at 771 (internal quotation marks omitted); FERC Order 745, *supra* note 93 at 1. The net-benefits test "makes certain that accepting a lower-priced demand response bid over a higher-priced supply bid will actually save LSEs (i.e., wholesale purchasers) money." *EPSA*, 136 S. Ct. at 771.

106. *EPSA*, 136 S. Ct. at 772 (citing 16 U.S.C. § 824d (2012)).

107. FERC Order 745, *supra* note 93, at 1.

IV. DEMAND RESPONSE PRECEDENT

A. FERC v. EPSA

The Electric Power Supply Association ("EPSA") brought the initial challenge to Order 745 in 2013.[108] Electricity generation organizations, demand response providers, grid operators, and large corporations joined EPSA's action, arguing FERC did not have authority under the Federal Power Act ("FPA") to "regulate the rules used by operators of wholesale electricity markets to pay for reductions in electricity consumption and to recoup those payments through adjustments to wholesale rates."[109] In its brief on appeal to the Supreme Court, the EPSA argued that "FERC has no more jurisdiction to regulate retail-level 'demand response' through payments to retail customers than it does to raise retail prices directly."[110] The challenge sparked debate over the extent to which federal and state regulators can or cannot allow demand—that is, anything on the customer side of the electric meter—to participate in grid affairs.[111]

The D.C. Circuit ruled that the FPA bars FERC from directly regulating any matter under state control, including the retail energy market.[112] The three-judge panel reasoned that demand response, while not necessarily a retail sale, is part of the retail market, exclusively within the jurisdiction of the states.[113] Given longstanding precedent in the realm of agency rulemaking, FERC argued on appeal that the D.C. Circuit misinterpreted the FPA, and misapplied basic principles of agency deference under *Chevron*.[114] According to the Solicitor General, who filed the

108. Elec. Power Supply Ass'n v. FERC, 753 F.3d 216 (D.C. Cir. 2014).

109. Brief for Petitioner, *supra* note 95, at I.

110. Walton, *supra* note 22.

111. Robert Walton, *EPSA Urges Supreme Court Not to Reconsider FERC Order 745 Invalidation*, UTILITY DIVE (Mar. 20, 2015), http://www.utilitydive.com/news/epsa-urges-supreme-court-not-to-reconsider-ferc-order-745-invalidation/377342 [https://perma.cc/SS49-3ALQ].

112. Katherine Tweed, *Supreme Court Will Hear FERC Order 745 Demand Response Case*, GREENTECH MEDIA, (May 4, 2015), http://www.greentechmedia.com/articles/read/supreme-court-will-hear-ferc-order-745-demand-response-case [https://perma.cc/6XCD-QH4Q].

113. *Id.*

114. *See* Brief for Petitioner, *supra* note 95; Jeff St. John, *The Future of Demand Response: How a Legal Challenge Could Dramatically Change the*

Supreme Court challenge on behalf of FERC, the Court of Appeals "departed from the interpretive approach to the FPA that the court has applied for a half-century;" that is, to give FERC flexibility in performing its mandate of ensuring just and reasonable wholesale electricity rates.[115]

The issues on appeal to the Supreme Court were: (1) whether FERC has the authority to regulate the rules by which operators of wholesale-electricity markets pay for reductions in electricity consumption and recoup those payments through adjustments in wholesale rates;[116] and (2) even if FERC has requisite statutory jurisdiction, did the agency adequately justify why "demand response providers and electricity producers should receive the same compensation?"[117]

The Supreme Court answered both questions affirmatively, upholding FERC's Order 745. Writing for the majority, Justice Kagan outlined three holdings: First, FERC has authority to require wholesale electric market operators to pay the same price to demand response providers for conserving energy as generators for producing it, so long as customers actually save money.[118] Under the FPA, FERC's regulatory jurisdiction is confined to these

Industry, GREENTECH MEDIA (Dec. 22, 2014), http://www.greentechmedia.com/articles/featured/ferc-order-745-the-supreme-court-and-the-future-of-demand-response [https://perma.cc/9PRA-RKMM]; *see also* Chevron U.S.A. v. Nat. Res. Def. Council, 467 U.S. 837, 843 (1984) ("If the statute is silent or ambiguous with respect to the specific issue, the question for the court is whether the agency's answer is based on a permissible construction of the statute."). "A permissible construction is one that is not 'arbitrary, capricious, or manifestly contrary to statute.'" David Kemp, *Chevron Deference: Your Guide to Understanding Two of Today's SCOTUS Decisions,* JUSTIA L. BLOG (May 21, 2012), https://lawblog.justia.com/2012/05/21/chevron-deference-your-guide-to-understanding-two-of-todays-scotus-decisions [https://perma.cc/QY3A-4FDV]. If the agency's construction is permissible, the agency's interpretation is given deference (so called *Chevron* deference). *Id.* The Government's alternative argument on appeal to the Supreme Court was that FERC's interpretation of the Federal Power Act was entitled to deference under *Chevron. See* FERC v. Elec. Power Supply Ass'n, 136 S. Ct. 760, 773 n.5 (2016). Because the Court found FERC had clear authority to act under the statute, it did not address the issue of *Chevron* deference. *Id.* at 785.

115. St. John, *supra* note 114.

116. *EPSA*, 136 S. Ct. at 767. The Supreme Court articulated the first issue as whether "the FPA permits FERC to regulate these demand response transactions at all, or does any such rule impinge States' authority?" *Id.*

117. *Id.*; Hempling, *supra* note 29.

118. *EPSA*, 136 S. Ct. at 760; *see* Hempling, *supra* note 29.

practices, and thus, Order 745 falls squarely within FERC's wholesale domain.[119] Second, although wholesale market transactions affect retail rates, FERC's regulatory plan did not invade states' authority to regulate retail rates.[120] Finally, FERC's compensation scheme of paying demand response providers at the LMP also paid to generators was not arbitrary and capricious under the Administrative Procedure Act.[121]

The issues required the Court to interpret the FPA in the context of the interconnected electricity grid. Justice Kagan noted the challenge at hand, "in point of fact, if not of law – the wholesale and retail markets in electricity are inextricably linked."[122] Adopting a "common sense construction of the FPA's language, limiting FERC's 'affecting' jurisdiction to rules or practices that '*directly* affect the [wholesale] rate'," the Court reasoned that regulating wholesale demand response was wholly within FERC's jurisdiction.[123] Demand response "directly affects" wholesale rates because, if rewarded at the LMP, as opposed to some lower price, more demand response providers will submit bids capable of displacing generation, in turn lowering wholesale electricity prices.[124] Additionally, increased market participation by demand response providers places "downward pressure" on bids from generators, thereby encouraging power plants to offer electricity at lower prices, lest they risk losing out at auction.[125] This too lowers rates for wholesale power purchasers, linking compensation for demand response directly to wholesale market prices.[126]

Accordingly, FERC's regulation did not violate the FPA by overstepping into the realm of state jurisdiction, "just because it affects – even substantially – the quantity or terms of retail sales."[127] In fact, the Court has long held that FERC may regulate matters beyond the wholesale market so long as States' retail rate-

119. *EPSA*, 136 S. Ct. at 760.
120. *Id.*
121. *Id.*
122. *Id.* at 766.
123. *Id.* at 774.
124. *Id.* at 774-75.
125. *EPSA*, 136 S. Ct. at 774-75.
126. *Id.*
127. *Id.* at 776.

setting authority is not infringed.[128] In regulating demand response, FERC did no more than address transactions occurring in the wholesale market:

> *Wholesale* market operators administer the entire program, receiving every energy demand response bid made. Those operators accept such bid at the mandated price when (and only when) the bid provides value to the *wholesale* energy market by balancing supply and demand more "cost effectively" – i.e. at a lower cost to *wholesale* purchasers – than a bid to generate power. The compensation paid for a successful bid [Locational Marginal Price] (LMP) is whatever the operator's auction has determined is the marginal price of *wholesale* electricity at a particular location and time. And those footing the bill are the same *wholesale* purchasers that have benefited from the lower *wholesale* price demand response participation has produced. In sum, whatever the effects at the retail level, every aspect of the regulatory plan happens exclusively on the wholesale market and governs exclusively that market's rules.[129]

EPSA argued to the contrary, claiming FERC usurped state power because the rule "effectively, even though not nominally regulates retail prices."[130] Nevertheless, EPSA conceded that

128. *See, e.g.,* Panhandle E. Pipeline Co. v. Pub. Serv. Comm'n of Ind., 332 U.S. 507, 516 (1947) (holding the same); *see also* Miss. Power & Light Co. v. Miss. ex rel. Moore, 487 U.S. 354, 365, 370-73 (1988) (holding an order regulating wholesale purchases was within FERC's jurisdiction and preempted state action despite clearly affecting retail prices); Nantahala Power & Light Co. v. Thomburg, 476 U.S. 953, 959-61 (1986) (holding the same).

129. *EPSA*, 136 S. Ct. at 776. While acknowledging that FERC's statutory authority extends to "some surprising places," the Court rejected the implications laid out by the D.C. Circuit. *Id.* at 774. In attempting to analogize the impact of wholesale demand response on retail rates, the D.C. Circuit drew conclusions beyond the scope of FERC's jurisdiction: "markets in all electricity's inputs – steel, fuel, and labor most prominent among them – might affect generator's supply of power. . .and for that matter, markets in just about everything – the whole economy, as it were – might influence LSE's demand." *Id.* The Supreme Court tersely stated otherwise: Congress never intended for the FPA to grant such expansive jurisdiction. While wholesale level demand response does influence LSE's demand, FERC's rules governing wholesale demand response programs, unlike the D.C. Circuit's hypothetical, meet the FPA's standard of "*directly* affecting wholesale electricity rates." *Id.* at 784 (emphasis added). Any extension to steel, fuel, or labor markets is too attenuated to fall within the FPA's jurisdictional sphere. *Id.*

130. *Id.* at 777.

FERC's rule did not set actual rates.[131] Rather, states can continue to make or approve retail rates, and in designing those rates, may insulate customers from price fluctuations in the market.[132] The Court looked to the Black's Law Dictionary definition of "rate" in reaching its holding. "Rate," according to Black's, is "an amount paid or charged for a good or service."[133] Accordingly, the act of setting retail rates is to "establish the amount of money a consumer will hand over in exchange for power."[134] FERC does not set retail electric rates simply by altering the incentive to purchase that product.[135] The Court dispelled the ESPA's argument by refusing to redefine "rate" as the price paid for electricity plus the opportunity cost of foregoing other alternatives.[136]

As its third and final holding, the Court found FERC's compensation scheme was not arbitrary or capricious under the Administrative Procedure Act ("APA"). Order 745 attempts to ensure "just and reasonable" wholesale rates, as per FERC's FPA mandate, by requiring market operators to compensate demand response providers in order to bring about "meaningful demand-side participation" in the wholesale market.[137] Upon meeting two conditions, market operators must pay the LMP for any accepted demand response bid as they would for any successful supply bids. In other words, demand response providers would receive the same payment for conserving electricity as generators would for producing it.[138]

The two-condition contingency ensures that FERC satisfies its statutory mandate in regulating practices that directly affect wholesale rates:

> First, a demand response bidder must have the "capability to provide the service" offered; it must, that is, actually be able to reduce electricity use and thereby obviate the operator's need to secure additional power. Second, paying the LMP for a demand

131. *Id.*
132. *Id.* at 777.
133. *Id.* (quoting *Rate*, BLACK'S LAW DICTIONARY (10th ed. 2014)).
134. *EPSA*, 136 S. Ct. at 777.
135. *Id.*
136. *Id.* at 778.
137. *Id.* at 771.
138. *Id.*

> response bid "must be cost effective," as measured by the net-benefits test. That test makes certain that accepting a lower-priced demand response big over a higher-priced supply bid will actually save LSEs (i.e. wholesale purchasers) money.[139]

The EPSA challenged FERC's compensation scheme on the grounds of misplaced economic theory, arguing that paying the LMP would overcompensate demand response providers.[140] Under the EPSA's view, the LMP includes a retail rate that reflects the costs a generator incurs and the benefits it obtains in the process.[141] In reaching the LMP value, FERC found such considerations to be irrelevant: "paying LMP to all generators – although some would then walk away with more profit and some with less – 'encourages more efficient supply and demand decisions'. . .and [there is] no economic reason to treat demand response providers differently."[142] FERC went to great lengths to explain why rewarding demand response providers at the LMP encourages competition and in turn, lowers wholesale prices.[143]

Despite the EPSA's urging, the Court declined to read the "FPA, against its clear terms, to halt a practice that so evidently enables [FERC] to fulfill its statutory duties of holding down prices and enabling market reliability in the wholesale energy market."[144] In reviewing FERC's compensation scheme, the Court, under the APA's standard, refused to substitute its judgment for FERC's expertise.[145] The scope of the arbitrary and capricious standard is narrow – the court must uphold an agency's rulemaking if the agency has "examined the relevant considerations and articulated a satisfactory explanation for its action, including a rational connection between the facts found and the choice made."[146] The Court affords great deference to FERC's rate decisions upon a detailed explanation of its choice of the LMP

139. *Id.*
140. *EPSA*, 136 S. Ct. at 782.
141. *Id.*
142. *Id.* at 783 (citation omitted).
143. *Id.* at 783.
144. *Id.* at 780.
145. *Id.* at 782
146. *EPSA*, 136 S. Ct. at 782 (citation omitted).

pricing scheme over the opponent's preferred LMP – G scheme.[147] Ultimately, FERC engaged in reasoned decision making, weighed competing views, and intelligibly explained its compensation decision, well within the bounds of its agency expertise.[148]

B. Post FERC v. EPSA

The Supreme Court's decision makes clear that states may take some ownership of retail-level demand response, and leaves states with at least three definitive options.[149] First, states can decide whether customers may even sell demand response to begin with.[150] This option is pertinent to states that do not currently have demand response programs.[151] Second, states can decide what companies can sell into the wholesale market, if at all.[152] Third, states can decide whether demand response, once aggregated by permitted companies, will be used to reduce local utility load (retail demand response) or will be sold directly into the wholesale market (wholesale demand response).[153] Accordingly, states have enormous discretion to implement the Court's holding – their degree of power ranges from excluding demand response programs from their state altogether to determining whether demand response will be used in the retail or wholesale energy market. The wholesale market will continue exploring alternative rules to manage demand-side resources.[154] Some ISOs have already prepared plans to allow demand response to continue in other demand-side markets.[155] The balance between state and federal control in electricity markets arising out of the Court's decision has lead energy regulatory experts to call *FERC*

147. *Id.* at 782. The "G" value represents the retail cost and benefits, or the opportunity costs of foregoing generation. *Id.*

148. *Id.* at 784.

149. *Id.*

150. Hempling, *supra* note 29.

151. *Id.*

152. *Id.*

153. *Id.*

154. Davide Savenije, *ICYMI: What To Expect When Demand Response Goes Before the Supreme Court*, UTILITY DIVE (May 6, 2015), http://www.utilitydive.com/news/icymi-what-to-expect-when-demand-response-goes-before-the-supreme-court/394575/ [https://perma.cc/BX2J-8XQL].

155. *Id.*

v. EPSA a landmark decision for the future of energy law and policy.[156]

New York agencies' challenge to the NYISO's Buyer-Side Mitigation ("BSM") rule provides a case study into the jurisdictional aftermath of *EPSA* and sheds light on the challenges states are already facing in implementing the Court's ruling.[157] New York's Reforming the Energy Vision ("REV") proceeding and California's Independent System Operator's ("CAISO") Distributed Energy Resource Provider ("DERP") Program are two examples of state-level market reforms that take advantage of demand response. These kinds of state retail-level demand response mechanisms are likely to take center stage. CAISO's DERP has so far been successful at achieving electricity cost savings, and New York's REV proceeding aims to achieve similar savings with alternative market mechanisms.[158] Regardless of how individual states implement the Supreme Court's ruling, they will play an integral role in forthcoming demand response mechanisms, filling the gaps where FERC's jurisdiction does not reach.

C. Top-Down v. Bottom-Up Regulatory Approaches

The California Independent System Operator's ("CAISO") Distributed Energy Resource Provider ("DERP") Program may serve as a model for states aiming to expand retail-level demand response.[159] The DERP is a top-down regulatory approach, in that it is designed and administered by the ISO, and applies to electric

156. Walton, *supra* note 22.

157. *See generally* Complaint, N.Y. State Pub. Serv. Comm'n et al. v. N.Y. Indep. Sys. Operator, 153 FERC ¶ 61,022 (June 25, 2016) (No. EL 16-92-000). "New York agencies" includes the New York State Public Service Commission, New York Power Authority, Long Island Power Authority, New York State Energy Research and Development Authority, and the City of New York. *Id.* Advanced Energy Management Alliance and the Natural Resources Defense Council joined the New York agencies, who collectively comprise the "complainants" in the BSM challenge. *Id.*

158. *See* CAL. INDEP. SYS. OPERATORS, ENERGY STORAGE AND AGGREGATED DISTRIBUTED ENERGY EDUCATION FORUM 43 (2015), http://www.caiso.com/Documents/Presentation-EnergyStorageandAggregatedDistributedEnergyResource-EducationalForum.pdf [https://perma.cc/NN7S-QMXF4].

159. *See* CAL. INDEP. SYS. OPERATORS, EXPANDED METERING AND TELEMETRY OPTION PHASE 2 (2015), http://www.caiso.com/Documents/DraftFinalProposal_ExpandedMetering_TelemetryOptionsPhase2_DistributedEnergyResourceProvider.pdf [https://perma.cc/C386-DL6S].

utilities.[160] Under the rule, electric service companies and utilities can purchase and consolidate energy outputs from distributed energy resources into a bundle of resources that can then be sold into the ISO electricity market.[161] Distributed Energy Resource Providers are analogous to demand response providers in current ISO markets, and thus, the CAISO reasoned that demand response is a category of distributed energy resources that may be aggregated and sold into the wholesale market.[162] Essentially, the ISO did with the DERP what the Supreme Court allowed FERC to do under Order 745. With the DERP, utilities may sell demand response from the retail-level distributed energy resources into the wholesale market.[163] FERC Order 745 allows aggregated retail customers, especially those owning or utilizing distributed energy resources, to sell demand response into the wholesale market.[164]

New York's Reforming the Energy Vision ("REV") proceeding, on the other hand, constitutes "bottom-up" reform.[165] The Public Service Commission ("PSC") initiated REV, which works up from the PSC to the ISO level.[166] REV aims to expand and integrate distributed energy resources into the state's energy profile.[167] While both the CAISO proposal and REV have the integration of distributed energy resources in mind, REV seeks to move distributed energy resources from alternative resources to the source of core generation in investor-owned utility business models.[168] REV also differs in that participating distributed energy resource providers may sell distributed energy resource outputs

160. *Id.* at 5.

161. *Id.*

162. *Id.* at 4.

163. *Id.* at 5.

164. FERC Order 745, *supra* note 93, at 1.

165. *Reforming the Energy Vision*, N.Y. STATE DEP'T OF PUB. SERV., http://www3.dps.ny.gov/W/PSCWeb.nsf/All/CC4F2EFA3A23551585257DEA007DCFE2? [https://perma.cc/C2YX-TDEL]. The REV proceeding is "bottom-up" in that utilities, the entities closest to retail consumers, administer demand response. This is contrasted with California's DERP "top-down" proceeding whereby ISOs, the regional entities closest to FERC (and thus farthest from retail customers) administers demand response. Under various tenants of New York's REV initiative, demand response has been implemented in both the wholesale and retail markets. *Id.*

166. *Id.*

167. *Id.*

168. *Id.*

into the retail market, as opposed to the ISO market proposed by the CAISO.[169]

The CAISO's DERP and New York's REV proceeding are expected to act as models for ISOs, utilities, and state regulatory agencies to adopt market mechanisms for implementing demand response from retail customers into the wholesale market.[170] States can use these model programs as case studies for designing regulatory market mechanisms that take full advantage of demand response's potential environmental benefits. While both the DERP and REV have environmental goals in mind, numerous other regulatory mechanisms exist to address climate change and mitigate environmental damages through the utilization of demand response.

D. Case Study: New York Buyer-Side Mitigation Rule Challenge

In March 2008, FERC directed the NYISO to implement buyer-side mitigation ("BSM") measures in its installed capacity market ("ICAP market").[171] Price signals in the ICAP market "indicate[ ] when sufficient capacity is available or when additional ICAP resources are needed to meet New York's peak demand and maintain its planning reserve margin."[172] To prevent artificial suppression of capacity market prices, the NYISO instituted two capacity market mitigation measures: first, Offer Cap mitigation in the form of a maximum offer price intended to prevent suppliers from raising prices above competitive levels, and second, Offer Floor mitigation in the form of a minimum offer price aimed at preventing the suppression of prices below competitive levels.[173] The NYISO instituted the mandatory measures in the form of tariff provisions that limited the participation of certain demand

169. *Id.*

170. *See* Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision, N.Y. STATE DEP'T OF PUB. SERV., http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=14-m-0101 [https://perma.cc/4XJ3-247J].

171. N.Y. Indep. Sys. Operator, Inc., 122 FERC ¶ 61,211, 62,191 (Mar. 7, 2008).

172. Complaint at 9-10, N.Y. State Pub. Serv. Comm'n et al. v. N.Y. Indep. Sys. Operator, 153 FERC ¶ 61,022 (May 8, 2015) (No. EL 15-64-000).

173. *Id.* at 16.

response providers, or Special Case Resources ("SCR"), in the ICAP market.[174] The mandatory measures provide that "unless exempt from [market] mitigation, new capacity resources must enter [mitigated capacity zone ICAP] markets . . . at a price at or above the . . . offer floor and continue to meet the offer floor until their capacity clears twelve month auctions."[175] Under the BSM rules, the NYISO must evaluate every resource in a mitigated zone to determine if it should receive an exemption from the capacity offer floor or cap measures.[176] If an SCR is ineligible for an exemption, it is subject to mitigation and may be unable to earn capacity market revenues if the clearing price at auction is below the SCR's minimum bid, or offer floor.[177]

In May 2015, the New York PSC, the New York Power Authority ("NYPA"), and the New York State Energy Research and Development Authority ("NYSERDA") (collectively, the "Parties") filed a complaint against the NYISO arguing, inter alia, that the BSM rules should not apply to renewable energy resources, nuclear resources, SCRs, and demand response resources.[178] In regards to demand response, the Parties advocated that including state-level demand programs into the SCR Offer Floor calculation would likely deter demand response from participating in utility demand response programs to avoid mitigation in capacity markets.[179] The Parties asserted that the BSM rules would have the effect of "interfering with the State's distribution-level [d]emand [r]esponse programs . . . [and] impermissibly intrud[ing] upon reliability and distribution planning matters reserved to the states under the Federal Power Act," a similar argument advanced by the EPSA before the Supreme Court.[180] Relatedly, Parties asserted that the BSM rules interfere with the State's ability to use demand

174. Morrison, *supra* note 55, at 14.

175. *Id.* (citation omitted).

176. Complaint, *supra* note 172, at 11.

177. *Id.* at 18.

178. N.Y. State Pub. Serv. Comm'n et al. v. N.Y. Indep. Sys. Operator, 153 FERC ¶ 61,022 (Oct. 9, 2015) (No. EL 15-64-000). The Parties made additional arguments as to the application of the BSM measures that are not within the scope of this note's discussion. The Parties were joined in November 2015 by the City of New York, Multiple Intervenors, and the Natural Resources Defense Council in seeking a rehearing of FERC's BSM Exemption Order.

179. Complaint, *supra* note 157, at 3.

180. *Id.*

response as a system tool to lower retail rates.[181] In effect, the Parties argued NYISO's BSM rules constituted impermissible overreaching into state jurisdictional territory under the FPA by erecting barriers to entry into the state's demand response programs.[182]

By interfering in state-level demand response, the Parties argued that the NYISO interfered with legitimate state policy objectives that obligate the PSC to consider environmental policy when setting utility distribution rates and regulations.[183] New York's 2015 State Energy Plan instituted REV and outlined the state's policy of "removing market barriers and bridging market gaps to transition New York to a clean energy economy that will produce economic growth and preserve the state's environment by reducing the emissions of greenhouse gases and other pollutants."[184] Additionally, the Energy Plan instructed that mechanisms that reduce or shift peak demand, such as demand response, should be "seriously considered, whenever practical."[185]

In so inducing SCRs to choose between participating in retail, distribution-level demand response participation or NYISO-administered demand response, the BSM rules effectively limited the state's ability to achieve its environmental targets, particularly due to the fact that both wholesale and retail demand response are necessary to achieve wide-spread environmental benefits. Wholesale and retail demand response are "intended to address different systems, yield distinct benefits, and compensate for different services provided."[186] The Parties called out the cooperative federalism argument espoused by the Supreme Court, and in response to Parties' complaint, the NYISO agreed. In its answer, the NYISO recognized the indirect effect BSM rules would have on demand response participation, erecting a barrier to entry in the market, and halting the state's ability to meet its REV, and state energy policy goals.[187]

181. *Id.*
182. *Id.*
183. *Id.* at 37 (citing N.Y. ENERGY LAW § 3-0101(1) (2016)).
184. *Id.* at 38 (citation omitted).
185. Complaint, *supra* note 157, at 39.
186. *Id.* at 42.
187. Answer at 2, N.Y. State Pub. Serv. Comm'n et al. v. N.Y. Indep. Sys. Operator, 153 FERC ¶ 61,022 (No. EL 16-92-000) (Aug. 2016).

In effect, the Parties' challenge of the NYISO's market rules was a direct application of the *EPSA* decision. FERC, and the entities subject to its jurisdiction, may regulate the wholesale market but must not interfere in retail rate-setting. As opposed to Order 745's demand response rules deemed legitimate by the Supreme Court, the NYISO's BSM rules (wholesale capacity market rules) interfered with the state's ability to set just and reasonable retail rates through the use of distribution-level (retail market) demand response, in contravention of the FPA and the Supreme Court's *EPSA* holding. The arguments espoused by Parties represent the challenges states may face in implementing the Court's ruling. This challenge presents a case study into states' abilities to advocate for large-scale environmental benefits through the use of both wholesale and retail demand response.

V. ENVIRONMENTAL ANALYSIS OF DEMAND RESPONSE

By shaping consumer preferences for energy resources and shifting consumption to lower-demand periods, demand response has great potential to lessen the environmental externality costs of generating electricity. While promoting more renewable energy resources and strategically shifting demand has been shown to reduce greenhouse gas emissions at the local level, little is known of the full environmental benefits of demand response.[188] Thus, an environmental regulatory scheme aimed at combating climate change should incorporate some form of demand response in both retail and wholesale energy markets. A brief analysis of demand response studies is necessary to understand the full beneficial potential of incorporating demand response into an environmental regulatory scheme.

Demand response studies have revealed the energy conservation potential of strategic demand curtailment. When customers see the impact of demand response on their monthly electric bills, over time, they may adopt further conservation habits that, when combined with other demand-side energy-saving strategies, have quantifiable environmental benefits. However, "one of the most important yet inadequately investigated elements

188. *See* Nemtzow et al., *supra* note 13, at 43.

of [demand response] is its impact on the environment. There are numerous reasons to expect a positive environmental impact . . . but the results will always be very system- and generation-fleet specific."[189]

Perhaps the primary "environmental" characteristic of demand response is its ability to shape individual consumer behavior towards more energy efficient electricity consumption by animating wholesale and capacity market forces.[190] The extent to which demand response can shape consumption is ultimately dependent on the energy resources used to produce the grid's electricity supply (the generation fleet).[191] For instance, implementing demand response in a grid system where gas generators supply baseload and diesel fuel generators supply peak load will produce different environmental impacts than demand response mechanisms in a grid mix containing coal baseload generators and hydro-electric peaking generators.[192] Given the variety of energy fuels used to generate electricity across the United States, the environmental benefits accruing from demand response are dependent on what fuel sources are used, how close generation is located to the point of consumption, the consumption patterns of end users – including residential, commercial, and industrial consumers – and the regulatory reach of the entities who participate in and/or administer the demand response program.[193]

While the environmental impacts associated with demand response are partially dependent on the energy fuel used to produce electricity, the converse is also true – demand response can encourage the use of particular energy fuels (i.e. natural gas, solar, wind, etc.) to generate electricity.[194] Namely, demand response can encourage implementation of renewable energy resources into the grid's mix of electricity.[195] The very nature of demand response – cutting consumption to decrease demand on the system – facilitates the use of intermittent generation, for instance, sources such as wind and solar, that cannot be generated

189. *Id.*
190. *Id.* at 41.
191. *Id.* at 43.
192. *Id.* at 43.
193. *See generally id.*
194. Nemtzow et al., *supra* note 13, at 43.
195. *See generally id.*

when the wind is not blowing or when the sun is not shining.[196] In addition to using demand response to cut consumption during peak demand periods, it can also be used to balance load as intermittent energy sources power up and come on line.[197] Load balancing, the practice of storing power during low demand periods to meet increasing demand, may alleviate the intermittency downfalls of renewable energy resources, thereby making renewable energy a more viable, dependable supply of energy.[198] In this way, and in combination with certain new technologies, demand response is an important support infrastructure for developing renewable energy resources.[199]

The environmental benefits of demand response go much farther than simply shifting and cutting energy consumption. In fact, studies aimed at exploring the location-based environmental benefits of demand response suggest that demand response can mitigate the effects of climate change through the reduction of carbon, nitrous oxide, and sulfur dioxide emissions.[200] Shifting generation from peak to off-peak periods also shifts emissions from energy generation and consumption to off-peak periods.[201] Off-peak periods include nighttime, when less electricity is needed in homes, businesses, and industrial processes, and spring and fall, when air conditioning and heating are not used to the extent they are needed in the summer and winter.[202] Greenhouse gases like nitrous oxide, sulfur dioxide, and particulates can be altered and exacerbated by the presence of sunlight and high temperatures.[203] Mixed with sunlight, these greenhouse gas emissions form ground-

196. *Id.* at 44.

197. *Id.*

198. *See* Lauren Sommer, *A (Load) Balancing Act: The Challenge of Clean Power*, NPR (Aug. 18, 2010, 1:00 PM), http://www.npr.org/templates/story/story.php?storyId=129253742 [https://perma.cc/AN66-SPA6].

199. Nemtzow et al., *supra* note 13, at 45.

200. *See id.*

201. *Id.* at 44.

202. *Time of Use Hours & Pricing*, PAC. POWER, https://www.pacificpower.net/ya/po/otou/ooh.html [https://perma.cc/XB4Y-FLL2].

203. *Causes of Climate Change*, EPA, http://www3.epa.gov/climatechange/science/causes.html [https://perma.cc/54P5-2TR5]. Greenhouse gases released overnight are nevertheless affected by rising temperatures and sunlight the following day; however, by shifting daytime energy use to off-peak periods, less greenhouse gases are emitted during these high temperature/sunlight periods, mitigating some climate change effects. *See generally id.*

level ozone and smog.[204] Thus, shifting electricity consumption to off-peak periods can reduce greenhouse gas emissions by alleviating the formation of ozone and smog.[205] Because of demand responses' potential to drastically mitigate greenhouse gas emissions in this way, the Ozone Transport Commission and state environmental agencies have begun to explore the use of demand response as a method for achieving ambient air quality standards in non-attainment areas regulated under the Clean Air Act.[206]

Though the emissions-mitigation and renewable energy implementation benefits of demand response have wide-reaching impacts on global climate change, most environmental benefits from demand response occur at the local level.[207] In a 2003 study modeling the impact of demand response on air emissions in New England, Synapse Energy Economics ("Synapse") noted resulting regional emissions reductions.[208] The study examined large, established demand response programs, and included models for distributed generation.[209] Because demand response functions to shift electricity consumption to off-peak periods, the study found reductions in greenhouse gas emissions to be most significant in summer months.[210] Synapse noted significant reductions in

204. Nemtzow et al., *supra* note 13, at 44.

205. *Id.*

206. *Id.*

207. *Id.*

208. *Id.*

209. *Id.* Distributed generation is defined as "renewable energy sited at or close to where its energy is consumed." THOMAS BOURGEOIS ET AL., PACE ENERGY & CLIMATE CTR., COMMUNITY MICROGRIDS: SMARTER, CLEANER, GREENER 3 (2013), http://energy.pace.edu/sites/default/files/publications/Community%20Microgrids%20Report%20(2).pdf [https://perma.cc/LHP3-NP25]. Distributed generation can take the form of solar photovoltaics, solar thermal, wind, hydro, geothermal, or biomass, as well as combined heat and power technologies. *Id.* at 2. Distributed generation allows electricity to be produced closer to the source of consumption, thereby reducing line losses (energy lost as heat in the transmission process) and emissions from large-scale baseload generators. Distributed generation has been recognized as a clean energy resource with valuable implications for future energy markets. *See* ASHWANI KUMAR, ZONAL-BASED APPROACH FOR OPTIMAL LOCATION OF DISTRIBUTED GENERATION IN POOL-BASED DEREGULATED ELECTRICITY MARKETS AND POTENTIAL BENEFITS (2010), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1539296 [https://perma.cc/A2FL-9FS3]; THOMAS BOURGEOIS ET AL., *supra* note 209.

210. Nemtzow et al., *supra note* 13, at 44. Reductions in greenhouse gases were most noticeable in the summer months because demand response shifted consumption to non-summer months. *Id.* Because less electricity was consumed

nitrous oxide, sulfur dioxide, and carbon dioxide attributable to demand response programs.[211] In comparing the effect of demand response on diesel- versus gas-fired generation, however, Synapse noted only "small but significant impacts" on emissions.[212] Nevertheless, the study ultimately found large-scale demand response mechanisms significantly reduced most criteria pollutant emissions in the New England Region.[213] While the results of the Synapse study could not be extrapolated beyond the New England region, the study nonetheless supports the theory underlying this note – that state-level demand response must coincide with a federal-oversight model in order to affect an environmental regulatory scheme.

In January 2015, the Brattle Group, Inc. completed a study on behalf of EnerNOC analyzing the benefits of demand response.[214] The results included a generally smaller geographic footprint of the grid.[215] Such findings were primarily the result of reduced generator total emissions, including reduced criteria and hazardous pollutants.[216] The study advised that "these reductions would be particularly valuable in designated 'non-attainment areas' where pre-determined emissions levels cannot be exceeded."[217] To the extent that reductions in peak demand also avoided new generation, demand response could be credited with reduced impacts on wildlife habitats and sensitive ecosystems.[218] Additionally, if utilities incorporated time-varying retail rates to institute demand response, a strong rate aimed at skimming peak

in the summer, less greenhouse gases were emitted in the generation of electricity, and thus, less emissions were present during prime ozone- and smog-forming sunny months. *Id.*

211. *Id.*

212. *Id.* In this particular study, Synapse did not explore the emissions reductions associated with shifting consumption from gas- to renewable-powered generation resources. *Id.*

213. *Id.*

214. RYAN HLEDIK & AHMAD FARUQUI, VALUING DEMAND RESPONSE: INTERNATIONAL BEST PRACTICES, CASE STUDIES, AND APPLICATIONS 26-27 (2015), http://www.brattle.com/system/publications/pdfs/000/005/343/original/Valuing_Demand_Response_-_International_Best_Practices__Case_Studies__and_Applications.pdf?1468964700 [https://perma.cc/N29P-REQ7].

215. *Id.* at 27.

216. *Id.*

217. *Id.*

218. *Id.*

load could aid in the implementation of distributed energy resources.[219] "For example, a strong time-of-use rate could improve the economics of rooftop solar by aligning the higher priced peak pricing period with the time of the highest output from the system."[220] Numerous other studies have supported these key findings.[221]

VI. DESIGNING AN ENVIRONMENTAL REGULATORY SCHEME

Wholesale and retail demand response mechanisms are not mutually exclusive. While the Federal Power Act creates distinct spheres of jurisdiction between wholesale and retail markets, the division of power between the state and federal government has not been so clear.[222] Perhaps the decade-old struggle to draw jurisdictional lines has been settled by the Court's embrace of cooperative federalism inherent in the FPA: "the [FPA] makes federal and state powers 'complimentary' and 'comprehensive,' so that there will be no 'gaps' for private interests to subvert the public welfare. Or said otherwise, the statute prevents the creation of any regulatory 'no man's land'."[223] States aiming to incorporate wholesale demand response alongside retail demand response programs in the aftermath of *EPSA* can look to the Supreme Court, California, and New York for examples of demand response in the context of environmental regulatory schemes.

---

219. *Id.*

220. HLEDIK & FARUQUI, *supra* note 214, at 29.

221. *See* GREAT PLAINS INST., ENVIRONMENTAL BENEFITS OF DEMAND RESPONSE (2014), http://www.betterenergy.org/files/DR%20Fact%20Sheet%202%20Environmental%20Benefits%20of%20DR.pdf [https://perma.cc/NLT4-W92K]; *see* MONITORING ANALYTICS, THE 2017/2018 RPM BASE RESIDUAL AUCTION: SENSITIVITY ANALYSES (2014), http://www.monitoringanalytics.com/reports/Reports/2014/IMM_20172018_RPM_BRA_Sensitivity_Analyses_20140710.pdf [https://perma.cc/NLT4-W92K]; *see* JAMES MCANANY, 2014 DEMAND RESPONSE OPERATIONS MARKET ACTIVITY REPORT: OCTOBER 2014 (2014), http://www.pjm.com/~/media/markets-ops/dsr/2014-dsr-activity-report-20141008.ashx [https://perma.cc/6D5K-R3HS].

222. Joel B. Eisen, *FERC's Expansive Authority to Transform the Electric Grid*, 49 U.C. DAVIS L. REV. 1783, 1788-89 (2016).

223. FERC v. Elec. Power Supply Ass'n, 136 S. Ct. 760, 779 (2016) (citations omitted).

A. Strengths and Weaknesses of Wholesale v. Retail Demand Response

FERC's broad authority could be used to implement wide-ranging environmental and energy objectives.[224] So long as the environmental and energy goals pursued by FERC have a direct or integral impact on wholesale markets, it cannot be said to be beyond its jurisdiction.[225] This gives FERC broad discretion to incorporate environmentally sustainable objectives into wholesale level demand response programs, to trump less environmentally beneficial state law when there is a direct conflict, and even influence the retail market to the extent that retail activities impact wholesale electricity markets.[226]

FERC could use its broad authority to incorporate a new positive value system into wholesale electricity markets.[227] In determining the wholesale price of electricity resources, FERC can incorporate environmental and social externality values.[228] In placing a carbon adder on the wholesale price of coal and natural gas,[229] while offering renewable energy credits for solar, wind, and hydroelectric power, FERC can effectively charge unsustainable fossil fuel electricity generators for their emissions.[230]

FERC's authority to regulate the wholesale market must be exercised to fill the gaps where state jurisdiction ends. Federal initiatives that direct ISOs/RTOs to implement demand response programs that incentivize the use of renewable over nonrenewable energy resources (without hindering market entry into state-level demand response) have quantifiable widespread environmental benefits.[231]

224. Eisen, *supra* note 222, at 1783.

225. *Id.* at 1805.

226. *Id.* at 1813.

227. *Id.* at 1783.

228. *Id.* at 1848.

229. A carbon adder is an additional charge (usually a few cents per megawatt hour) added to the wholesale price of an energy commodity to internalize the externality cost of carbon emissions released from the combustion of that resource. *Id.* at 1788, 1834.

230. *See* Eisen, *supra* note 222, at 1834.

231. U.S. DEP'T OF ENERGY, BENEFITS OF DEMAND RESPONSE IN ELECTRICITY MARKETS AND RECOMMENDATIONS FOR ACHIEVING THEM: A REPORT TO THE U.S. CONGRESS PURSUANT TO SECTION 1252 OF THE ENERGY POLICY ACT OF 2005 xv (2006), http://energy.gov/sites/prod/files/oeprod/DocumentsandMedia/DOE_ Bene

Conversely, some scholars argue that FERC's jurisdiction, while wide in scope, is not so wide as to transform the electric grid into a less environmentally intensive entity.[232] The Department of Energy (DOE) has even cautioned policymakers in attributing environmental benefits to demand response.[233] The DOE's caveat only applies a marginal percent to global environmental benefits. Based on studies from the early 2000's, the DOE determined that environmental gains from demand response are "dependent on the emissions profiles and marginal operating costs of the generation plants in specific regions."[234] Since 2006, however, the value of localized benefits stemming from demand response has been recognized.[235] In its Report to Congress on the benefits of demand response in the electricity market, the DOE did not wholly throw out demand response as potentially environmentally beneficial. Rather, the DOE advised that in order to appropriately assess the possible environmental benefits of demand response, the amount of emissions reductions during peak demand – as a result of a curtailed response – must be weighed against increases in emissions during off-peak hours, as well as increased use of distributed generation.[236] In balancing these considerations, localized environmental benefits have a larger marginal impact on the local grid system.[237] Cumulatively, localized benefits may have a marginal effect on the larger grid system.[238]

B. Reaping the Environmental Benefits of Demand Response

Numerous market and policy mechanisms, when deployed under the right conditions, can achieve environmental benefits.[239] To optimize environmental objectives, the electricity market must

fits_of_Demand_Response_in_Electricity_Markets_and_Recommendations_for_Achieving_Them_Report_to_Congress.pdf [https://perma.cc/5V8G-Z6N7].

232. *See* Jeffrey Chow et al., *Energy Resources and Global Development*, 302 SCI. 1528 (2003).

233. U.S. DEP'T OF ENERGY, *supra* note 231, at 29.

234. *Id.* at 29.

235. *See generally id.*

236. *Id.* at 29.

237. *See id.*

238. *See* Nemtzow et al., *supra* note 13.

239. *See generally* Chow et al., *supra* note 232.

be transformed.[240] Both wholesale and retail markets must employ demand response programs that strategically curtail demand to reduce environmental impacts through conservation. To effectively internalize the externality costs of unsustainable electricity generation, policy makers must institute a national environmental regulatory scheme that fosters localized benefits. The breadth of FERC's jurisdiction over practices affecting the wholesale market gives it great discretion to equip states with the demand-side tools to sustainably manage energy consumption.[241] Due to the concentrated nature of demand response benefits, end-use customers at the local level must have a market incentive to prefer renewable energy.[242] FERC's ability to regulate wholesale energy prices gives it leeway to institute those market incentives.[243] When customers see increasing reductions in their monthly energy bills, they begin to form more sustainable consumption habits over time.[244] Consumption patterns at the local level affect needed supply at the wholesale level.[245] Thus, conscious consumers can shape national energy resource use, but to do so, they must see the true cost of that energy.

The federal regulatory model must comprise aspects of cooperative federalism, whereby state governments, state agencies, and FERC exercise non-conflicting jurisdiction. Both state and federal entities must retain their distinctive jurisdictional roles, but rather than being mutually exclusive, the presence of both powers must strengthen the overall regulatory scheme. A rule is stronger when enforced by both states and the

240. *See* PETER H. KIND, PATHWAYS TO A 21ST CENTURY ELECTRIC UTILITY 6 (2005), https://www.ceres.org/resources/reports/pathway-to-a-21st-century-electric-utility [https://perma.cc/GH45-6GQ9].

241. *See* Eisen, *supra* note 222, at 1792.

242. *Id.*

243. *Id.* at 1794.

244. *See id.* New York is doing this through the REV initiative. Order Adopting a Ratemaking and Utility Revenue Model Policy Framework, Case 14-M-0101, 2 (May 19, 2016). Track 2 of the order is aimed at creating a "modern regulatory model" that changes the way utilities are compensated so as to promote more efficient and environmentally sustainable utility business practices. *Id.* Rather than the tradition ratemaking case used in reaching regulated utility rates, the new mechanism will allow utilities to make profits from practices that incentive distributed generation deployment and the use of demand management practices like demand response. *Id.*

245. *See* Eisen, *supra* note 222, at 1794.

federal government than by one entity alone. States must inform federal environmental regulation in order to maximize local environmental benefits. In the areas where states cannot regulate, federal agencies must extend their jurisdiction in a way that promotes environmental sustainability. The federal regulatory model should aim to reduce the negative environmental impacts associated with energy production, generation, and consumption to the same, or even greater degree than the market would incidentally achieve as a result of scarcity-induced price increases and other spikes in demand.[246] To determine how stringent regulation must be to achieve those results, the externality costs of the entire electric generating system must be quantified and internalized. Studies determining the social cost of carbon and tests for quantifying social values from various perspectives should be utilized in implementing policy mechanisms like "environmental standards, fuel and emission taxes, subsidies for renewable energy production, mandated diversified energy portfolios, and emission permit-trading schemes."[247] New York is doing this through the use of zero-emission credits ("ZECs") and renewable energy credits ("RECs") in emissions-trading schemes that use the social cost of carbon to set the price at which credits may be bought and sold.

FERC, in instituting Order 745, realized the inadequacy of demand response in the wholesale market and the threat to the system's ability to meet peak demand. While FERC has broad discretion to regulate wholesale market rates, it has limited authority to consider environmental objectives directly when determining whether wholesale electricity rates are just and reasonable. Thus, in order to ensure system reliability, demand response must be rationalized by the effects environmental benefits will have on the electric system. For instance, instead of a carbon adder, the wholesale price of energy could contain a "reliability adder."[248] Adding this cost would place a direct value on the system benefit, focusing on the grid benefits of demand response in order to achieve environmental benefits.[249] Such

246. Chow et al., *supra* note 232, at 1530.
247. *Id.*
248. Eisen, *supra* note 222, at 1839-40.
249. *Id.* at 1840.

market mechanisms would allow the wholesale price of electricity to more accurately be carried through to the customer, allowing the end user to form sustainable consumption patterns.[250]

Where FERC cannot directly regulate the energy sector with environmental sustainability in mind, state and local entities will play an important role. New York State has recognized the value of municipal involvement and customer engagement. In its REV proceeding, New York identified "mix[ed] traditional outreach methods . . . social media and community-based marketing approaches . . . [and] accommodating customer diversity in the design of demand side management programs" as best practices for customer education.[251] The value derived from engaging the public can be attributed to input on "cultural and behavioral factors that affect energy use."[252] Knowledge of these local characteristics better informs policy makers of customer consumption, allowing for more productive incentives and technologies to achieve environmental benefits.[253]

Retail-level demand response and state-level environmental regulation has even greater weight following *FERC v. EPSA*. In reversing the D.C. Circuit's ruling, the Supreme Court has effectively prevented the future of distributed generation and behind-the-meter technologies from falling exclusively into the regulatory hands of the states.[254] While this does not altogether sound like cause for environmentalist celebration, vacating Order 745 would have ultimately stripped FERC of the ability to regulate rooftop solar, on-site electricity storage, and other demand-side technologies.[255] If FERC was prohibited from factoring these demand-shaping entities into the wholesale price of energy, energy efficiency and demand management technologies would not be competitive with less expensive, but more environmentally

250. *Id.*
251. FED. ENERGY REG. COMMISSION, *supra* note 16, at 30.
252. *Id.*
253. *See id.*
254. Frank Lacey, *Why FERC 745 is About More Than Demand Response*, SMART ELEC. POWER ALL. (Jan. 6, 2016), http://www.solarelectricpower.org/utility-solar-blog/2016/january/why-ferc-745-is-about-more-than-demand-response.aspx [https://perma.cc/LV97-S5U7].
255. *Id.*

damaging energy resources.[256] Optimal environmental regulation in the aftermath of *FERC v. EPSA,* must thus strike a balance between state and federal authority that anticipates the jurisdictional gaps created by judicial and legislative decisions. For instance, states may be better suited to directly incorporate environmentally-geared demand response programs, incentives for renewable and distributed generation, and customer-tailored energy-saving technologies. Conversely, FERC is better suited to implement demand response that will indirectly accrue environmental benefits by shaping wholesale and capacity market forces, as reflected in decreased retail rates.

The environmentalist's ideal regulatory scheme must draw on the strengths and weaknesses of the division of power between the state and federal government to maximize benefits. The infeasibility of demand planning at the state level provides an opportunity for FERC oversight.[257] The impracticality of conducting supply-only planning at the federal level necessitates the need for cooperative federalism.[258] A system designed to the contrary would hardly be affordable nor effective at achieving environmental sustainability.[259] Despite decades of jurisdictional confusion over where the realm of state power ends and federal oversight begins, the solution to an environmentally-conscious energy regulatory scheme must strike a balance between these two spheres of influence.

VII. CONCLUSION

The era of cooperative federalism in demand response is just beginning. While the Supreme Court has granted FERC authority to regulate wholesale demand response affecting retail markets, states have additional power to determine what retail entities may administer demand response, if at all. In the aftermath of *FERC v. EPSA*, FERC will undoubtedly face the growing number of state-level programs that are popping up alongside, and sometimes overlapping with, wholesale level demand response programs. States will continue to fill the gaps by expanding on the already

256. *Id.*
257. *Id.*
258. *Id.*
259. *Id.*

increasing number of retail-level demand response programs. Thus, with both state and federal governments retaining jurisdiction over some aspect of demand response, the most environmentally-sound regulatory schemes will take advantage of this rare opportunity to enforce energy conservation at both the state and federal levels. In the coming decade, bottom-up and top-down reforms are necessary to realize dual environmentalism: the most responsible mechanism to manage energy consumption and its associated environmental impacts for the future.