MARKETS, EXTERNALITIES, AND THE FEDERAL POWER ACT: THE FEDERAL ENERGY REGULATORY COMMISSION'S AUTHORITY TO PRICE CARBON DIOXIDE EMISSIONS

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Carbon dioxide (CO_2) emissions impose a significant cost on society by contributing to climate change. The electricity sector is a major source of these emissions, yet their external cost is not fully reflected in electricity rates, and the market outcomes thus do not adjust to reflect those true costs—a classic market failure. This leads to emissions that are higher than optimal. Under the Federal Power Act (FPA), the Federal Energy Regulatory Commission (FERC) is tasked with ensuring that interstate wholesale electricity rates are "just and reasonable." Given the severity of the damages caused by the failure to internalize the CO_2 externality, it is crucial to understand whether the external cost of that negative externality can be included in wholesale rates.

This Article examines how FERC has embraced market efficiency as the key tool for ensuring just and reasonable rates and has addressed all of the standard market failures that would otherwise distort the efficiency of prices: market power, asymmetric information, public goods, and externalities. The Article then shows that any economically rational effort to achieve an efficient market must attempt to address the external cost of CO_2 emissions as well. This Article argues that, from an economic perspective, FERC's authority to pursue market efficiency should extend to either approving utility plans to internalize those

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external costs or to set a carbon price, just as it extends to other market failures.

FERC's authority in this area has its limits. Under the FPA's just and reasonable mandate, FERC has authority to address only the market failures that are directly related to wholesale electricity rates. In addition, FERC cannot act without evidentiary support or act directly to interfere in state-level generation mix choices. But seen from an economic perspective, there should be no impediment to FERC taking action to internalize the direct costs of greenhouse gas emissions—whether through approval of a utility's plan to take those costs into account or through a market correction issued by FERC itself.

TABLE OF CONTENTS

INTRODUCTION

One of the most important issues facing policymakers today is the need to address the well-recognized climate damages caused by emissions of greenhouse gases such as carbon dioxide (CO_2).[1] Electricity generation in the United States is the primary source of such emissions, accounting for 1,744 million tons in 2017.[2] Despite the severity of the problem, FERC, which regulates the interstate transmission and wholesale electricity markets, has avoided addressing the issue.

More recently, however, electricity market operators have begun considering plans to address CO_2 emissions in their wholesale operations.[3] New York's wholesale electricity market operator (NYISO) is studying the implementation of a carbon price, which would be designed to harmonize New York's carbon emissions reduction goals with the wholesale markets.[4] PJM Interconnection L.L.C. (PJM)—a Regional Transmission Organization (RTO) that coordinates the movement of wholesale electricity in all or parts of thirteen states and the District of Columbia—has put out a white paper that explores "two potential

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1 *See* Massachusetts v. EPA, 549 U.S. 497, 521 (2007) ("The harms associated with climate change are serious and well recognized."); *see also* Carbon Pollution Emission Guidelines for Existing Stationary Sources, 80 Fed. Reg. 64,662, 64,686–88 (Oct. 23, 2015) (to be codified at 40 C.F.R. pt. 60) (describing harms of climate change).

2 *See Frequently Asked Questions*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/tools/faqs/faq.php?id=77&t=11 (last visited Aug. 23, 2018).

3 *See* Shelley Welton, *Electricity Markets and the Social Project of Decarbonization*, 118 COLUM. L. REV. 1067, 1071 (2018) (discussing recent attention being paid to using electricity markets to decarbonize).

4 *See* N.Y. INDEP. SYS. OPERATOR, CARBON PRICING DRAFT RECOMMENDATIONS (2018), http://www.nyiso.com/public/committees/documents.jsp?com=bic_miwg_ipptf&directory=2018-08-06; SAMUEL A. NEWELL ET AL., THE BRATTLE GRP., PRICING CARBON INTO NYISO'S WHOLESALE ENERGY MARKET TO SUPPORT NEW YORK'S DECARBONIZATION GOALS iv–xi (2017), https://www.nyiso.com/documents/20142/2244202/2017-Brattle-NY-Carbon-Study.pdf/156a738d-e471-ccad-e146-07ac593ec0c3 [hereinafter BRATTLE PRICING CARBON REPORT].

carbon-pricing frameworks" that could be used to harmonize PJM's wholesale market with state goals that seek to promote renewable energy.[5]

FERC's failure thus far to address CO_2 emissions may be explained by the fact that FERC has historically shied away from taking environmental considerations into account in ratemaking.[6] But CO_2 emissions are not just an environmental consideration; they are a prime example of what economists call an "externality," a type of market failure that hinders the efficiency of competitive markets. Some market operators are considering implementing carbon pricing, which incorporates the price of CO_2 emissions into wholesale markets to correct that failure. In the absence of a nation- and economy-wide carbon tax, pricing CO_2 emissions at that wholesale level would be the most economically efficient way of correcting the CO_2 externality in the electricity markets.[7] Therefore, the question of whether FERC has authority to address the external cost of CO_2 emissions in order to achieve economically efficient wholesale energy markets is an increasingly important question.

This Article uses an economic framework to show that regulating carbon pricing fits within FERC's mandate to ensure just and reasonable rates. For the past several decades, FERC has used market efficiency to achieve just and reasonable rates.[8] And as an analysis of market efficiency will show, addressing the harms caused by greenhouse gas emissions in the regulation of interstate wholesale electricity generation should fit within that mandate to ensure "just and reasonable" rates.

The FPA gives FERC "the authority—and, indeed, the duty—to ensure that rules or practices 'affecting' wholesale rates are just and reasonable" and not unduly discriminatory.[9] Throughout its history, FERC achieved this goal by using multiple regulatory paradigms. More recently, to fulfill its duty of ensuring just and

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5 PJM, ADVANCING ZERO EMISSIONS OBJECTIVES THROUGH PJM'S ENERGY MARKETS: A REVIEW OF CARBON-PRICING FRAMEWORKS (2017), https://pjm.com/~/media/library/reports-notices/special-reports/20170502-advancing-zero-emission-objectives-through-pjms-energy-markets.ashx.

6 *See, e.g.*, Grand Council of the Crees v. Fed. Energy Regulatory Comm'n, 198 F.3d 950, 957 (D.C. Cir. 2000).

7 *See infra* Section III.

8 *See infra* Section II.B.

9 Fed. Energy Regulatory Comm'n v. Elec. Power Supply Ass'n, 136 S. Ct. 760, 773–74 (2016); *see also* 16 U.S.C. § 824d(a) (2012).

reasonable rates, FERC has embraced market-based solutions aimed at promoting economic efficiency and increasing competition.[10] For example, FERC has approved the use of market-based rates for electricity sales, in order to harness efficiencies that flow from market solutions.[11]

Economists indeed assume that perfectly competitive markets maximize the total net benefit of market participants and therefore are efficient.[12] When there is perfect competition, market prices equal the social marginal cost and they are a signal for efficient allocation of society's resources.[13] But perfectly competitive, and thus efficient, markets rarely exist. Most markets, including electricity markets, are marred by what economists call "market failures."[14] When there are market failures, prices no longer reflect the social marginal cost and the resulting allocation of resources in the economy is no longer efficient.[15] In those circumstances, regulatory intervention is needed.[16]

While different economists use different typologies, market failures are grouped broadly into four different categories: (1) market power, (2) asymmetric information, (3) public goods, and (4) externalities. Market power arises when sellers (or buyers) have power to increase the market price above (or below) competitive levels.[17] Information asymmetry exists when buyers or sellers in a market have an information advantage that they can exploit to their benefit.[18] Public goods are goods such as security

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10 *See Elec. Power Supply Ass'n*, 136 S. Ct. at 768; Grid Reliability & Resilience Pricing, 162 FERC ¶ 61,012, ¶ 9 (2018) ("[T]he Commission has largely adopted a pro-market regulatory model, wherein the Commission relies on competition in approving market rules and procedures that, in turn, determine the prices for the energy, ancillary services, and capacity products (where applicable).").

11 *See, e.g.*, Progress Power Mktg., Inc., 76 FERC ¶ 61,155 (1996).

12 *See* ROBERT S. PINDYCK & DANIEL L. RUBINFELD, MICROECONOMICS 611–13 (7th ed. 2009) (explaining that competitive markets will achieve an efficient allocation of resources).

13 *See id.*

14 *See id.*

15 *See id.* (explaining how each type of market failure leads to economic inefficiency).

16 PAUL KRUGMAN & ROBIN WELLS, MICROECONOMICS 12–16 (2d ed. 2009).

17 See *infra* Section II.B.3.a.

18 See *infra* Section II.B.3.b.

or reliability, which are typically underprovided by markets.[19] Externalities are costs or benefits of market transactions that are incurred by third parties and thus not considered by market participants.[20] When any of these market failures exist, market outcomes are no longer economically efficient.

Where FERC is relying on economic efficiency and competition in order to ensure just and reasonable rates, a wholesale market with market failures would undermine that goal. In order to move closer to an efficient market and just and reasonable rates, FERC must intervene and correct these failures. Indeed, FERC has recognized that each type of market failure exists in wholesale energy markets and has addressed them under its authority to ensure that wholesale rates are just and reasonable.[21] Courts have upheld FERC's use of market-based mechanisms to ensure just and reasonable rates;[22] conversely, courts have rejected FERC's regulations when FERC has failed to sufficiently address market failures.[23]

Yet for some reason, FERC has still not addressed the CO_2 emissions externality. As a result, because fossil fuel-fired generators do not have to bear the cost of the CO_2 emissions they generate, they can offer their electricity at prices that are lower than the true social marginal cost of producing it, even though consumers will still end up bearing those costs.[24] Consequently, more and dirtier electricity generation will occur than is socially optimal.[25] Using the best available estimate of the monetary value

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19 See *infra* Section II.B.3.c.

20 See *infra* Section II.B.3.d; *see also* KRUGMAN & WELLS, *supra* note 16, at 433–438; Rudy Perkins, *Electricity Deregulation, Environmental Externalities and the Limitations of Price*, 39 B.C. L. REV. 993, 994 (1998).

21 *See infra* Part II.B.3.

22 *See, e.g.*, California *ex rel.* Lockyer v. Fed. Energy Regulatory Comm'n, 383 F.3d 1006, 1012 (9th Cir. 2004).

23 *See* Tejas Power Corp. v. Fed. Energy Regulatory Comm'n, 908 F.2d 998, 1006 (D.C. Cir. 1990) (finding that FERC had not adequately addressed market power concerns in approving a gas pipeline company's proposed charge).

24 *See* PINDYCK & RUBINFELD, *supra* note 12, at 613 (discussing similar costs in the context of effluent discharged into a river).

25 *See, e.g.*, Elesha Simeonov, *Just Not Reasonable: What the FERC's Order on Demand Response Compensation Reveals about the Current Shortfalls in "Just and Reasonable" Rulemaking*, 31 TEMP. J. SCI. TECH. & ENVTL. L. 311, 334 (2012) (explaining that the failure to internalize the costs of pollution effects leads to market transactions that "undervalue the harms in the production of electricity, thereby making it cheaper than optimal"); Perkins, *supra* note 20, at 994, 1033, 1055 (explaining how the failure to internalize the cost of pollution

of the external damages of CO_2 emissions, electricity generation caused up to about $87.2 billion of external damages in 2017 alone.[26]

In order to achieve economic efficiency in the presence of negative externalities, those externalities need to be fully "internalized."[27] In other words, the parties to the market transaction must bear the external costs. A market price that reflects the full external cost of carbon emissions would align the transaction with the true social cost of that electricity in a simple and efficient way.[28] As a result, the markets would be efficient and FERC would satisfy its "just and reasonable" mandate.

As this Article shows, viewed from an economic perspective, approving any utility effort to correct the market failure that results from CO_2 emissions would fit within FERC's effort to ensure an efficient market regardless of its environmental impact.[29] The external cost of CO_2 emissions is directly tied to the social marginal cost of production and, therefore, directly affects the reasonableness of the price for each megawatt-hour of electricity that is generated. To be sure, tangential or indirect externalities are beyond FERC's authority.[30] For example, authorizing a generator to use market-based rates might affect whether the owner of the generator expands the facility, which might affect a particular bird

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leads to inefficiently high levels of pollution and less-than-optimal energy projects).

26 This number is calculated using the federal Interagency Working Group's ("IWG") Social Cost of Carbon methodology. In 2017, electricity generation in the United States caused 1,744 million tons of CO_2 emissions. *See* U.S. ENERGY INFO. ADMIN., *supra* note 2. Using the IWG's estimate of about $50 per ton in 2017 dollars, that amount of emissions cost society $87,200,000,000 in 2017 dollars. *See* INTERAGENCY WORKING GRP. ON SOC. COST OF GREENHOUSE GASES, TECHNICAL SUPPORT DOCUMENT: TECHNICAL UPDATE OF THE SOCIAL COST OF CARBON FOR REGULATORY IMPACT ANALYSIS UNDER EXECUTIVE ORDER 12866 16 (2016) [hereinafter TECHNICAL SUPPORT DOCUMENT]; *What is the SCC?*, INST. FOR POLICY INTEGRITY, https://costofcarbon.org/faq/what-is-the-scc (last visited Oct. 29, 2018).

27 *See* KRUGMAN & WELLS, *supra* note 16, at 438, 445 (quick review side bar).

28 *See* Welton, *supra* note 3, at 1104 (collecting sources for the point that "[p]utting a price on carbon is theoretically appealing because of its potential breadth, simplicity, and efficiency").

29 While this Article focuses on the external cost of greenhouse gas emissions, these principles would apply to any other pollutant that directly affects the social marginal cost of electricity production.

30 *See* Joel B. Eisen, *FERC's Expansive Authority to Transform the Electric Grid*, 49 U.C. DAVIS L. REV. 1783, 1830 (2016) (explaining the direct versus indirect line).

population.[31] But that type of indirect and tangential externality does not change the social marginal cost of generation and is too remote to vest authority in FERC to address it. In contrast, the CO_2 emissions externality directly affects rates, and any effort to internalize that direct cost at the wholesale market level would also directly affect rates and be within FERC's authority to supervise.[32]

Other authors have previously argued that FERC has authority to address the external cost of emissions.[33] Scholars have said that FERC could allow utilities to address the environmental impact of CO_2 pollution by incorporating state environmental policies into their tariffs;[34] adopt "grid system reliability adders," upon a finding that reliability would be at risk without more renewable resources, in setting transmission rates;[35] reinterpret the FPA to allow FERC to take "environmental considerations" into account;[36] or use the FPA's direction to consider the "public interest" to address environmental considerations.[37] But existing scholarship has yet to focus on the externality as a market failure and address these external costs in the context of FERC's wide-ranging authority over market failures.

Our Article contributes to the literature on FERC's authority to price CO_2 emissions in wholesale electricity markets in two distinct ways. First, we link the foundation of FERC's authority directly to its "just and reasonable" mandate without having to rely on any state public policy justification. Second, we explain how the standard arguments opposing FERC's authority to price CO_2

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31 *See* Grand Council of the Crees v. Fed. Energy Regulatory Comm'n, 198 F.3d 950, 954 (D.C. Cir. 2000).

32 *See* Fed. Energy Regulatory Comm'n v. Elec. Power Supply Ass'n, 136 S. Ct. 760, 774 (2016) (explaining the "directly affects" test).

33 *See, e.g.*, Eisen, *supra* note 30, at 1788 (arguing that FERC has authority to address externalities because they directly affect rates).

34 *See* Ari Peskoe, *Easing Jurisdictional Tensions by Integrating Public Policy in Wholesale Electricity Markets*, 38 ENERGY L.J. 1, 2 (2017).

35 Jim Rossi, *Carbon Taxation by Regulation*, 102 MINN. L. REV. 277, 331 (2018).

36 Christopher J. Bateman & James T. B. Tripp, *Toward Greener FERC Regulation of the Power Industry*, 38 HARV. ENVTL. L. REV. 275, 329 (2014).

37 *See* STEVEN WEISSMAN & ROMANY WEBB, BERKELEY SCH. OF LAW CTR. FOR LAW, ENERGY & THE ENV'T, ADDRESSING CLIMATE CHANGE WITHOUT LEGISLATION 1, 4 (2014), https://www.law.berkeley.edu/files/CLEE/FERC_Report_FINAL.pdf.

emissions[38] miss the mark, because they are focused on FERC's authority to act on environmental issues rather than on FERC's authority to correct market failures. We build on existing literature addressing practices that directly affect rates[39] to show how the externality created by CO_2 emissions has a direct impact on social marginal cost and thus directly affects the efficiency of rates. To accomplish this task, we provide a comprehensive economic framework and show that the CO_2 externality is a traditional market failure that must be corrected in order to ensure an efficient market.

Even though FERC is not an "environmental" regulator, FERC has longstanding authority to fix this market failure under its traditional role as an "economic" regulator. Consideration of CO_2 emissions is not simply an environmental concern but rather a core market concern that is integral to a functional and efficient market. Socially optimal economic regulation cannot be achieved without consideration of the external costs of CO_2 emissions that are directly related to electricity generation.

This is not to say that FERC's authority to address CO_2 emissions is boundless. FERC must assemble a record to support its actions and demonstrate that its actions truly address market failures and that the resulting rates are, therefore, just and reasonable.[40] Any carbon price must be guided by sound economic principles and must be based on the external damages caused by CO_2 emissions.

In addition, FERC must respect state authority over the generation mix in any effort to address externalities. Without clear congressional authorization, FERC may not use its authority to intrude into an area of longstanding state control. Thus, attempting to use its authority to directly undermine state public policy goals directly would be unlawful.

The remainder of the Article is organized as follows. Part I provides an overview of the statutory and regulatory backdrop for

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38 *See, e.g.*, John Moot, *Subsidies, Climate Change, Electric Markets and the FERC*, 35 ENERGY L.J. 345, 348 (2014) (arguing that FERC does not have authority to "pick winners and losers by choosing sides in the climate change debate").

39 *See, e.g.*, Eisen, *supra* note 30, at 1835–43.

40 *See* S.C. Pub. Serv. Auth. v. Fed. Energy Regulatory Comm'n, 762 F.3d 41, 54 (D.C. Cir. 2014) (describing the evidentiary standard that FERC must meet).

FERC's market regulation, as well as a brief explanation of economic efficiency and perfectly competitive markets. Part II offers an overview of market failures and provides examples of FERC's regulation of them. Part III explains how externalities are a common market failure that renders rates unjust and unreasonable, and outlines FERC's authority to address them. Part IV discusses the limits on FERC's authority in this area.

I. STATUTORY AND ECONOMIC FRAMEWORK

In this Part, we first review the statutory framework of the FPA. Then, we discuss the basic economic principles related to perfectly competitive markets.

A. *The Federal Power Act*

Early on, states and localities regulated most electricity generation, transmission, and electricity distribution.[41] But in the 1920s, the Supreme Court held that the Constitution bars states from regulating interstate electricity transactions, leaving any interstate transactions unregulated.[42] Congress responded in the 1930s by passing the FPA and creating FERC's predecessor agency, the Federal Power Commission, to regulate wholesale interstate electricity transactions.[43]

Under the FPA, the Federal Power Commission (now FERC) regulates two significant features of electricity rates. First, FERC must ensure that rates are "just and reasonable" and prevent utilities from showing undue prejudice or discrimination in the transmission or sale of wholesale electricity.[44] Second, FERC is

41 *See* Fed. Energy Regulatory Comm'n v. Elec. Power Supply Ass'n, 136 S. Ct. 760, 767 (2016).

42 *See* Pub. Util. Comm'n of R.I. v. Attleboro Steam & Elec. Co., 273 U.S. 83, 89 (1927).

43 *See* New York v. Fed. Energy Regulatory Comm'n, 535 U.S. 1, 6 (2002). We use the terms wholesale and interstate interchangeably to refer to electricity sales that are made over an interstate grid and are thus subject to FERC's jurisdiction. Wholesale markets are considered interstate markets because wholesale electricity sales generally make use of the electricity grid, which is almost always connected to interstate electricity lines. *See* Fed. Power Comm'n v. Fla. Power & Light Co., 404 U.S. 453, 469 (1972) (deferring to FERC's judgment that in-state sales were subject to federal jurisdiction because the utility purchasing the power made use of transmission lines that were ultimately connected to an interstate grid).

44 16 U.S.C. § 824d(a)–(b) (2012); § 824e(a).

charged with performing this function with respect to rates themselves as well as the rules and practices directly affecting rates.[45] This section will discuss these two features of FERC's authority in more detail.

1. *Just and Reasonable and Undue Discrimination*

Under the FPA, FERC must ensure that the rates that "public utilities"—generators or transmission owners trading in wholesale electricity[46]—charge on the interstate market are just and reasonable.[47] In addition, FERC is tasked with preventing utilities from showing any market participant "undue preference or advantage" when setting rates, and with correcting any undue discrimination in the market.[48]

FERC's authority under these provisions allows it to adjust rates within a "range of reasonableness" and to respond to anticompetitive behavior or market imperfections.[49] It also allows FERC to remedy "discrimination in wholesale market operations."[50] But while FERC is charged with safeguarding against undue discrimination, "dissimilar treatment of dissimilar resources does not constitute undue discrimination."[51] Only "similarly situated" resources should expect similar treatment.[52]

FERC performs its functions under sections 205 and 206 of the FPA. Under section 205, it reviews and approves utility tariffs showing the "rates and charges . . . and the classifications, practices, and regulations affecting such rates and charges."[53] Under section 206, FERC has authority to investigate whether a "rule, regulation, practice, or contract affecting such rate, charge,

45 *See* § 824d(b); § 824e(a).

46 § 824(e).

47 § 824d(a).

48 *Id.*; § 824(e).

49 *See* Ill. Cities of Bethany v. Fed. Energy Regulatory Comm'n, 670 F.2d 187, 191 (D.C. Cir. 1981).

50 *See* Eisen, *supra* note 30, at 1817; *see also* Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Services by Public Utilities, 61 Fed. Reg. 21,540, 21,560 (May 10, 1996) (using this authority to remedy anticompetitive effects on an industry-wide basis).

51 Cal. Indep. Sys. Operator Corp., 119 FERC ¶ 61,061, ¶ 70 (2007).

52 Black Oak Energy, LLC v. Fed. Energy Regulatory Comm'n, 725 F.3d 230, 239 (D.C. Cir. 2013) ("FERC reasonably determined that the virtual marketers are not similarly situated to the rest of PJM's market participants.").

53 16 U.S.C. § 824d(c).

or classification is unjust, unreasonable, unduly discriminatory or preferential" and, if FERC finds in the affirmative, to impose a rate that is just and reasonable in its place.[54]

Under either section, FERC's "findings must be supported by 'substantial evidence.'"[55] The substantial evidence test requires FERC to "specify the evidence on which it relied and . . . explain how that evidence support[s] the conclusion it reached."[56] FERC is not required to point to empirical evidence to support all of its findings; it may be sufficient to support them with "reasonable economic propositions."[57] For example, FERC does not need to prove through economic data or experiments that gravity exists or that competition helps lower prices.[58]

Most of FERC's activity occurs under section 205. Under that section, FERC reviews rates proposed by utilities, rather than setting the rates itself under section 206.[59] In reviewing section 205 submissions, FERC has a "passive and reactive role" and will approve a tariff if it is just and reasonable.[60] FERC is authorized to "accept or reject" a proposal[61] and may not impose a modification that would result in a different rate scheme, even if the utility agreed to the modification.[62] In reviewing utilities' submissions, FERC is not required to follow any specific rate-setting formula.[63]

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54 § 824e(a); *see also* Atlantic City Elec. Co. v. Fed. Energy Regulatory Comm'n., 295 F.3d 1, 10 (D.C. Cir. 2002) ("In order to make any change in an existing rate or practice, FERC must first prove that the existing rates or practices are 'unjust, unreasonable, unduly discriminatory or preferential.'").

55 S.C. Pub. Serv. Auth. v. Fed. Energy Regulatory Comm'n, 762 F.3d 41, 65 (D.C. Cir. 2014) (quoting 5 U.S.C. § 706(2)(E)).

56 *Id.* at 54 (quoting Wis. Gas Co. v. Fed. Energy Regulatory Comm'n, 770 F.2d 1144, 1156 (1985)) (internal quotation marks omitted).

57 *Id.* at 65.

58 *See id.*

59 Metro. Edison Co. v. Pa. Pub. Util. Comm'n, 767 F.3d 335, 369 (3d Cir. 2014).

60 NRG Power Mktg. v. Fed. Energy Regulatory Comm'n, 862 F.3d 108, 114 (D.C. Cir. 2017); *see also* Atlantic City Elec. v. Fed. Energy Regulatory Comm'n, 295 F.3d 1, 9 (D.C. Cir. 2002).

61 *NRG Power Mktg.*, 862 F.3d at 114.

62 *See id.* at 115. Only "'minor deviations'" from the submission are permissible. *Id.* (quoting W. Res., Inc. v. Fed. Energy Regulatory Comm'n, 9 F.3d 1568, 1579 (D.C. Cir. 1993)).

63 *See* Maine v. Fed. Energy Regulatory Comm'n, 854 F.3d 9, 20 (D.C. Cir. 2017); *see also* Farmers Union Cent. Exch., Inc. v. Fed. Energy Regulatory Comm'n, 734 F.2d 1486, 1501 (D.C. Cir. 1984).

But it is required to balance the interests of the investor and the consumer.[64]

FERC acts under section 206 as well, though less often. In contrast to its actions under section 205, when FERC is acting under section 206, it has more room to impose practices or rules of its own design, as long as it satisfies a dual burden.[65] FERC must first demonstrate that existing rates are "unjust, unreasonable, unduly discriminatory or preferential."[66] Second, FERC must show through "substantial evidence that the new rate is just, reasonable and not unduly discriminatory."[67] Courts show significant deference to FERC's rate decisions.[68] To overturn FERC's judgment, a challenger must make a strong showing that the consequences of FERC's judgment are unjust and unreasonable.[69] Courts look at whether the agency provided a reasoned explanation for the decision, considered competing views, and chose a formula that was supported by the record.[70]

2. *Direct Effect on Wholesale Rates*

In pursuing just and reasonable rates and protecting against undue discrimination, FERC has authority to regulate "interstate . . . wholesale rates and the panoply of rules and practices affecting them."[71] But as the Supreme Court has explained, authority over every rule or practice that affects a wholesale rate would be too expansive.[72] A literal reading of that authority could support the view that FERC has authority over the whole economy, including electricity's inputs, such as steel, fuel, and labor, as well as markets in anything that influences utilities'

64 *See* Morgan Stanley Capital Grp. Inc. v. Pub. Util. Dist. No. 1 of Snohomish Cty., 554 U.S. 527, 532 (2008).

65 *See Maine*, 854 F.3d at 21.

66 16 U.S.C. § 824e(a).

67 Ameren Servs. Co. v. Midwest Indep. Transmission Sys. Operator, Inc., 121 FERC ¶ 61,205, ¶ 32 (2007).

68 *See Morgan Stanley Capital Group Inc.*, 554 U.S. at 532.

69 *See In re* Permian Basin Area Rate Cases, 390 U.S. 747, 767 (1968) (citing Fed. Power Comm'n v. Hope, 320 U.S. 591, 602 (1944)).

70 *See* Fed. Energy Regulatory Comm'n v. Elec. Power Supply Ass'n, 136 S. Ct. 760, 784 (2016).

71 *Id.* at 773.

72 *See id.* at 774.

demand.[73] As the Court recognized, Congress could not have meant to give FERC such sweeping authority.[74]

For that reason, the Court adopted a commonsense test that limits FERC's authority to rules or practices that "directly affect the wholesale rate."[75] Under that test, FERC does not have jurisdiction over the market for steel (even if steel is necessary to build transmission lines) or over labor (even if workers are required to generate electricity).[76] Similarly, as the D.C. Circuit held, FERC does not have jurisdiction to direct the California Independent System Operator (CAISO) to alter the structure of its corporate governance.[77] And, as the Supreme Court further held, FERC does not have jurisdiction to address employment discrimination at utilities.[78]

On the other hand, because FERC does have authority over programs that directly affect rates, FERC can order utilities to reward electricity users for reducing demand because those "demand response" programs are "all about reducing wholesale rates."[79] Demand response programs have a direct impact on the rates, because they reduce the need for high-priced generation, thus lowering the wholesale prices.[80] As another example, FERC has authority to require utilities to consider the transmission needs driven by state-level public policy programs, which seek to encourage and promote renewable generation.[81] Transmission planning is within FERC's authority, because the ability to use the

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73 *See id.*

74 *See id.*

75 *Id.* (quotation marks omitted); *see also* Transmission Planning & Cost Allocation by Transmission Owning & Operating Pub. Utilities, 139 FERC ¶ 61,132, ¶ 210 (2012) (FERC has authority "to assess practices that directly affect or are closely related to a public utility's rates."); Cal. Indep. Sys. Operator Corp. v. Fed. Energy Regulatory Comm'n, 372 F.3d 395, 403 (D.C. Cir. 2004) (FERC's actions must be addressed to "methods or ways of doing things on the part of the utility that directly affect the rate or are closely related to the rate.").

76 *See* Fed. Energy Regulatory Comm'n v. Elec. Power Supply Ass'n, 136 S. Ct. 760, 774 (2016); *see also* Eisen, *supra* note 30, at 1834–43 (discussing four guidelines for ascertaining whether a practice falls within FERC's authority).

77 *See* Cal. Indep. Sys. Operator Corp. v. Fed. Energy Regulatory Comm'n, 372 F.3d 395, 403 (D.C. Cir. 2004).

78 *See* NAACP v. Fed. Power Comm'n, 425 U.S. 662, 664 (1976).

79 *Elec. Power Supply Ass'n*, 136 S. Ct. at 774.

80 *See id.* at 774–75.

81 *See* Transmission Planning & Cost Allocation, 139 FERC ¶ 61,938, ¶ 209 (2012) (explaining that agency was requiring utilities to consider transmission needs driven by state-level policies in their "transmission planning processes").

transmission lines has "a direct and discernable effect" on rates.[82] FERC also has authority to order utilities to allow electric storage resources to participate in the energy, capacity, and ancillary markets because energy storage directly affects how much generation is needed on the grid, especially during times of peak demand.[83] As we show below, CO_2 damages similarly directly affect rates, and wholesale market-level programs to price those damages also directly affect rates.

B. *Markets and Economic Efficiency*

Before discussing FERC's actions within the statutory framework of promoting an efficient electricity market, it is helpful to review the principles behind economic efficiency and "perfectly competitive" markets. An efficient market is one where "all the opportunities to make some people better off without making other people worse off have been exploited."[84] If all of those transactions occur, then the total welfare of consumers and producers—the social welfare—is maximized.[85] Furthermore, when such efficiency is achieved in a market, all the resources in that market are allocated to their most productive use.[86]

Basic principles of economics tell us that if markets are what economists call "perfectly competitive," then they are usually efficient.[87] Generally speaking, a perfectly competitive market has two features: (1) many sellers that can compete to sell their identical goods to many buyers[88] and (2) free entry and exit of firms.[89]

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82 *Id*.

83 *See* Electric Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators, 162 FERC ¶ 61,127, ¶ 1 (2018); Richard L. Revesz & Burcin Unel, *Managing the Future of the Electricity Grid: Energy Storage and Greenhouse Gas Emissions*, 42 HARV. ENVTL. L. REV. 139, 140–41 (2018).

84 *See* KRUGMAN & WELLS, *supra* note 16, at 15.

85 *See id*. at 14–15, 111; PINDYCK & RUBINFELD, *supra* note 12, at 315; STEVEN STOFT, POWER SYSTEM ECONOMICS: DESIGNING MARKETS FOR ELECTRICITY 54 (2002); Emily Hammond & David B. Spence, *The Regulatory Contract in the Marketplace*, 69 VAND. L. REV. 141, 169 (2016) (explaining that well-functioning competitive markets will maximize the net benefits for society).

86 *See* PINDYCK & RUBINFELD, *supra* note 12, at 597.

87 *See* KRUGMAN & WELLS, *supra* note 16, at 111.

88 *See* PINDYCK & RUBINFELD, *supra* note 12, at 272.

89 *See id.*

Many sellers that sell the exact same product helps ensure that each individual seller has a very small market share and thus can have no impact on the price paid by consumers.[90] If sellers try to charge a higher price, consumers will simply turn to the next, cheaper seller. Similarly, when there are many buyers and each buys only a small portion of the output, no individual buyer can affect the market price.[91] In other words, in perfectly competitive markets, both consumers and producers are "price takers," taking the market price as given when deciding how much to buy or sell instead of trying to change the market price through their production or consumption decisions.[92] Another way of putting it is that when buyers and sellers are price takers, they are "acting competitively."[93]

The second key feature is free entry and exit. Free entry and exit means that there are no special costs or barriers to firms entering or exiting the market.[94] As a result, firms can enter if they see opportunities to earn profits, or exit if they are no longer earning profits.[95] Without free entry and exit, it is difficult to ensure effective competition. If a new supplier cannot easily enter the market, a firm may be able to raise its price without losing customers. If, however, both buyers and sellers are free to make decisions about consumption and production as well as entry and exit, they can take advantage of opportunities for mutually beneficial trades.[96]

With these features in place, in perfectly competitive markets, there is a single market clearing price that is determined where the supply curve for the product intersects the demand curve—in other words, where supply equals demand.[97] This is known as the equilibrium price, which is equal to the marginal cost of production—the additional cost of producing one more unit of a

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90 *See* KRUGMAN & WELLS, *supra* note 16, at 330–31; PINDYCK & RUBINFELD, *supra* note 12, at 8, 272.

91 *See* KRUGMAN & WELLS, *supra* note 16, at 330; *see also* PINDYCK & RUBINFELD, *supra* note 12 at 272; *see also* STOFT, *supra* note 85, at 51–52.

92 *See* STOFT, *supra* note 85, at 53.

93 *See id.* at 51–53.

94 *See* KRUGMAN & WELLS, *supra* note 16, at 332; *see also* PINDYCK & RUBINFELD, *supra* note 12, at 272–73; *see also* STOFT, *supra* note 85, at 53.

95 *See* KRUGMAN & WELLS, *supra* note 16, at 332; *see also* PINDYCK & RUBINFELD, *supra* note 12, at 273.

96 *See* KRUGMAN & WELLS, *supra* note 16, at 15.

97 *See* PINDYCK & RUBINFELD, *supra* note 12, at 272.

particular good or service.[98] The marginal cost takes into account the cost of inputs necessary for production, as well as the opportunity cost of capital, because sellers will consider both in their decisions.[99]

The marginal cost of production is especially important in economic decisionmaking. Certain decisions, such as how much to produce, are decisions made "at the margin."[100] Producers decide at the margin how much to produce by comparing the costs and the benefits of doing a little bit more of an activity—known as the marginal cost and benefit.[101] At a perfectly competitive equilibrium, where demand equals supply, the marginal cost equals marginal benefit, and social welfare is maximized; producing any more or any less would reduce the net social welfare.[102] In the electricity context, if generating one more megawatt-hour of electricity benefits society more than it costs society, that additional generation increases social welfare.[103] Additional generation would continue to increase social welfare until the marginal benefit of one more megawatt-hour of electricity equals its marginal cost; at this point social welfare would be maximized.

In a perfectly competitive market, free entry and exit ensures that firms make what economists call "normal" economic profits in the long run.[104] Making normal economic profits means that a firm's profit is zero after accounting for the opportunity cost of capital.[105] In other words, when a firm is making normal economic profits, incoming revenue is more than outgoing expenditures and there is a return on investment.[106] But this rate of return is just high enough to be considered worth investing in the firm, and no

98 *See* KRUGMAN & WELLS, *supra* note 16, at 231, 235–36; STOFT, *supra* note 85, at 57.

99 *See* KRUGMAN & WELLS, *supra* note 16, at 230; PINDYCK & RUBINFELD, *supra* note 12, at 222, 283.

100 *See* KRUGMAN & WELLS, *supra* note 16, at 8.

101 *See id.*

102 *See id.* at 106–113.

103 *See id* at 8, 235–36.

104 *See id.* at 336; *see also* PINDYCK & RUBINFELD, *supra* note 12, at 294–96, 349.

105 *See* KRUGMAN & WELLS, *supra* note 16, at 349; *see also* STOFT, *supra* note 85, at 58.

106 *See* PINDYCK & RUBINFELD, *supra* note 12, at 294, 296–97.

more.[107] If firms are making above normal profits, it would be economic for more firms to enter the market, pushing the market price—and hence profits—down.[108] If firms are making below normal profits, firms will exit the market, pushing the market price—and hence profits—up.[109] At the market equilibrium, all the firms that choose to stay in the market will be selling their goods at the marginal cost of production and will be making normal economic profits.

At this equilibrium, all consumers who value the good at or above this equilibrium price—marginal cost—and only those consumers, will buy the good.[110] In other words, the good is consumed by those who value it most.[111] Similarly, every seller that can produce the good at or below marginal cost, and only those sellers, will produce the good.[112] In this way, the good is produced by the cheapest suppliers.[113] Therefore, no mutually beneficial transactions are unexploited and the efficient amount of quantity is produced.[114] Essentially, the self-interest of individual actors ensures that an economy's resources are fully used and allocated according to their best use.

The price at this perfectly competitive equilibrium serves as a signal of the value of the good to society and works to drive efficient resource allocation.[115] In electricity markets, if such prices can be achieved, then both dispatch and investments would be economically efficient.[116] With the right price signals, wholesale markets will incentivize the entry of new generation when it is economical to do so, and the exit of existing generation when it is uneconomical. If FERC can ensure that the wholesale markets match the characteristics of perfectly competitive markets, then the wholesale rates and the resulting allocation of resources

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107 *See* KRUGMAN & WELLS, *supra* note 16, at 340; *see also* PINDYCK & RUBINFELD, *supra* note 12, at 294, 296–97.

108 *See* KRUGMAN & WELLS, *supra* note 16, at 346; *see also* PINDYCK & RUBINFELD, *supra* note 12, at 295; STOFT, *supra* note 85, at 53.

109 *See* PINDYCK & RUBINFELD, *supra* note 12, at 295.

110 *See* KRUGMAN & WELLS, *supra* note 16, at 109.

111 *See* STOFT, *supra* note 85, at 52–53.

112 *See* KRUGMAN & WELLS, *supra* note 16, at 109.

113 *See* STOFT, *supra* note 85, at 53.

114 *See* KRUGMAN & WELLS, *supra* note 16, at 109; STOFT, *supra* note 85, at 53.

115 *See* PINDYCK & RUBINFELD, *supra* note 12, at 611.

116 *See* STOFT, *supra* note 85, at 54.

would be economically efficient. FERC's actions over the past several decades show that it has indeed embraced these principles of perfectly competitive markets.

II. FERC'S SHIFT TOWARD COMPETITIVE WHOLESALE MARKETS

During the majority of the twentieth century, electricity markets were composed of vertically integrated firms that formed natural monopolies; thus, market-based principles were not directly applicable.[117] But over the last few decades, FERC has begun to harness these principles to promote competitive markets. This Part will provide an overview of this shift.

A. *Natural Monopolies and the Cost-of-Service Model*

Until recently, vertically integrated utilities owned all levels of generation, transmission, and distribution in order to provide electricity to consumers. Under that model, electricity was considered a natural monopoly, characterized by high fixed costs and, hence, falling average costs with increasing output.[118] In those circumstances, it is generally more efficient to have one firm serve the entire market.[119] But if that monopolist is left to its own devices, it has an incentive to restrict the amount it produces and charge higher prices to consumers, preventing some mutually beneficial transactions from happening and creating a welfare loss.[120] Therefore, regulation is necessary to ensure that welfare is maximized.[121] Typically, regulators determine a price that allows the natural monopolist to recover costs and a "fair" rate of return, without exploiting consumers.[122] In other words, regulation is meant to guarantee the natural monopolist receive normal economic profits, and nothing more.

Before the 1990s, due to the vertically integrated nature of the electricity market, FERC relied on this natural monopoly framework to regulate the market. Rates were judged just and reasonable if they allowed utilities to recover costs as well as "a

117 *See, e.g.*, Fed. Power Comm'n v. Texaco Inc., 417 U.S. 380, 397 (1974).
118 *See* KRUGMAN & WELLS, *supra* note 16, at 359.
119 *See* PINDYCK & RUBINFELD, *supra* note 12, at 372.
120 *See* KRUGMAN & WELLS, *supra* note 16, at 366–372.
121 *See id.* at 373–74.
122 *See* PINDYCK & RUBINFELD, *supra* note 12, at 372–73.

reasonable profit," known as cost-based rates.[123] Indeed, in the context of the monopoly forces at play in the market then, relying on market-based rates would have been unjust and unreasonable.[124]

B. *Competition and FERC's Responses*

But over the past several decades, smaller utilities have begun to compete with bigger utilities and transmission has become more economical, leading to jockeying for power—and the possibility for real competition.[125] Increased competition was partly driven by the 1970s oil crisis.[126] Congress responded to the crisis by enacting the Public Utility Regulatory Policy Act (PURPA) to encourage firms to build new generation sources.[127] At the same time, states began to deregulate their energy markets, allowing "load serving entities" (utilities that serve customers)[128] to purchase electricity at wholesale from generators and use that electricity to serve their customers.[129] As competition seeped into the electricity markets,

123 *See* ISO New England, Inc. & New England Power Pool Participants Comm. New England Power Generators Ass'n, 135 FERC ¶ 61,029, ¶ 253 (2011); *see also* Fed. Power Comm'n v. Hope Nat. Gas Co., 320 U.S. 591, 603 (1944) ("The rate-making process under the Act, i.e., the fixing of 'just and reasonable' rates, involves a balancing of the investor and the consumer interests."). For an economic critique of the cost-of-service framework, see Harvey Averch & Leland L. Johnson, *Behavior of the Firm Under Regulatory Constraint*, 52 AM. ECON. REV. 1052, 1052–69 (1962).

124 *See* Fed. Power Comm'n v. Texaco Inc., 417 U.S. 380, 397 (1974). This case involves the Natural Gas Act (NGA), but it is relevant to interpretations of the FPA because of the similar language in the two statutes. *See* Maine v. Fed. Energy Regulatory Comm'n, 854 F.3d 9, 20 (D.C. Cir. 2017) (explaining that "judicial interpretations of the FPA and the NGA may be followed interchangeably").

125 *See* Bateman & Tripp, *supra* note 36, at 289.

126 JUSTIN GUNDLACH & ROMANY WEBB, COLUMBIA LAW SCH. SABIN CTR. FOR CLIMATE CHANGE LAW, CARBON PRICING IN NEW YORK: ISO MARKETS 6 (2017), https://ssrn.com/abstract=2876895.

127 *See* Hammond & Spence, *supra* note 85, at 151; *see also* GUNDLACH & WEBB, *supra* note 126, at 6.

128 "Load serving entities" are utilities that have an obligation under federal, state or local law or under contract to provide electricity to end users. *See* 16 U.S.C. § 824q(a)(2)–(3) (2012).

129 *See* Hughes v. Talen Energy Mktg., LLC, 136 S. Ct. 1288, 1292 (2016); *see also* Grid Reliability & Resilience Pricing, 162 FERC ¶ 61,012, ¶ 8 (2018) ("[S]tarting in the 1990s, a number of states restructured their retail electricity markets to allow for more competition in the generation sector, which further contributed to development of bulk power markets and increased reliance on independent regional bodies for operation of the grid."); Regional Transmission

FERC responded by embracing markets as a useful tool for ensuring just and reasonable rates.

1. *Embracing Markets*

As competition increased, FERC began allowing firms to use market-based rates to set wholesale prices. In 1989, FERC issued an order allowing a "power marketer," Citizens Power & Light Corp., to engage in market-based wholesale transactions.[130] Power marketers buy electricity services from utilities and resell them on the wholesale market; they do not own any transmission or generation facilities.[131] While taking steps to ensure that Citizens Power could not exert market power,[132] FERC found that allowing the marketer to use flexible prices to make those deals would provide several benefits, including allowing Citizens Power to adapt quickly to new market conditions.[133] FERC also found that pricing flexibility would help align prices with "market conditions of scarcity or abundance."[134] Following the *Citizens Power* decision, FERC approved hundreds of petitions to use market-based rates on similar grounds.[135]

Since that time, FERC has regularly upheld the virtues of competition as a way to ensure just and reasonable rates.[136] Growing competition meant that market rates rather than cost-of-service rates could be used to achieve a socially optimal result. By moving to market-based prices, rather than administratively-determined prices, FERC was able to encourage a system that would better reflect changing conditions, "thereby providing market participants with an efficient price signal."[137] As FERC

Organizations, 65 Fed. Reg. 810, 813–14 (2000) (to be codified at 18 C.F.R. pt. 35) (describing state efforts to enhance competition).

130 *See* Citizens Power & Light Corp., 48 FERC ¶ 61,210 (1989).

131 *See id.* at 61,776.

132 *See infra Part* II.B.3.a.

133 *See* Citizens Power & Light Corp., 48 FERC ¶ 61,210, 61,777 (1989).

134 *Id.*

135 *See, e.g.*, Heartland Energy Servs., Inc., 68 FERC ¶ 61,223 (1994); Regional Transmission Organizations, 65 Fed. Reg. 810, 813 (Dec. 20, 1999) (to be codified at 18 C.F.R. pt. 35) (explaining in 2000 that FERC had "granted market-based rate authority to more than 800 entities").

136 *See, e.g.*, ISO New England, Inc. & New England Power Pool Participants Comm. New England Power Generators Ass'n, 135 FERC ¶ 61,029, ¶ 254 (2011).

137 *See, e.g.*, Frequency Regulation Compensation in the Organized Wholesale Power Markets, 137 FERC ¶ 61,064, ¶ 128 (2011) (explaining that

explained recently, this support for competitive markets is "grounded in the substantial and well-documented economic benefits that these markets provide to consumers."[138] Competition reduces consumers' bills and also provides additional savings "by removing congestion bottlenecks."[139] In addition, if the price signals in competitive markets are accurate, they could be relied on to encourage efficient allocation of resources, adjust supply, promote expansion, and help determine where new generators should be located.[140]

This change in regulatory paradigm from cost-of-service to market competition is grounded in the fundamental principle of economic theory that perfectly competitive markets are efficient. As explained above, economic theory shows that if FERC can ensure that wholesale markets imitate the basic characteristics of perfectly competitive markets, then the realized market prices also imitate perfectly competitive market prices and are efficient.[141] For that reason, FERC has used competition to achieve its "just and reasonable" mandate.[142] Indeed, FERC has explained that its "vision" now is to "ensure the delivery of dependable, affordable energy through reliance on sustained competitive markets."[143]

FERC's shift away from the cost-of-service model to the competition model has been affirmed by the U.S. Court of Appeals for the D.C. Circuit. As the court held, when true competition exists, FERC can rely on "market-based prices in lieu of cost-of-

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the market-based system had several benefits, including the fact that it would "encourage market participants to accurately bid their cost to provide the service" and that "better reflect current system conditions and need for frequency regulation").

138 Grid Reliability & Resilience Pricing, 162 FERC ¶ 61,012, ¶ 11 (2018).

139 *Id.*

140 *See* Order Directing Submission of Information with Respect to Internal Processes for Reporting Trading Data, 103 FERC ¶ 61,089, ¶ 11 (2003).

141 *See supra* Part I.B.

142 *See, e.g.*, ISO New England, Inc. & New England Power Pool Participants Comm. New England Power Generators Ass'n, 135 FERC ¶ 61,029, ¶ 254 (2011).

143 *See* Order Directing Submission of Information with Respect to Internal Processes for Reporting Trading Data, 103 FERC ¶ 61,089, ¶ 11 (2003); *see also* Regional Transmission Organizations, 65 Fed. Reg. 810, 811 (Dec. 20, 1999) (to be codified at 18 C.F.R. pt. 35) ("Competition in wholesale electricity markets is the best way to protect the public interest and ensure that electricity consumers pay the lowest price possible for reliable service.").

service regulation to assure a 'just and reasonable' result."[144] With truly competitive parties, the D.C. Circuit explained that it would be "rational to assume that the terms of their voluntary exchange are reasonable, and specifically to infer that price is close to marginal cost, such that the seller makes only a normal return on its investment,"[145] exactly in line with the principles of perfectly competitive markets.

2. *Enhancing and Encouraging Markets*

Besides embracing market-based rates, FERC has also taken steps to encourage markets. In 1996 and 2000, FERC issued two orders—Order 888 and Order 2000 respectively—which encouraged the creation of Independent System Operators (ISOs) and Regional Transmission Organizations (RTOs), wholesale market operators that run wholesale electricity markets and are regulated as utilities.[146] In Order 888,[147] FERC encouraged transmission owners to form ISOs that would "operate the transmission system independently of, and foster competition for electricity generation among, wholesale market participants."[148] FERC also provided guidelines for ISOs in order to promote financial independence from the utilities themselves and used pricing rules that fostered efficient generation, transmission, and demand.[149] In bringing transmission owners together, ISOs help facilitate transmission across regions, increasing opportunities for competition and promoting efficiency.[150]

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144 Elizabethtown Gas Co. v. Fed. Energy Regulatory Comm'n, 10 F.3d 866, 870 (D.C. Cir. 1993).

145 Tejas Power Corp. v. Fed. Energy Regulatory Comm'n, 908 F.2d 998, 1004 (D.C. Cir. 1990).

146 *See* Regional Transmission Organizations, 65 Fed. Reg. at 810.

147 *See* Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Services by Public Utilities, 61 Fed. Reg. 21,540, 21,595–96 (May 10, 1996) (to be codified at 18 C.F.R. pts. 35 and 385); *see also* Open Access Same-Time Information System and Standards of Conduct, 61 Fed. Reg. 21,737 (May 10, 1996) (to be codified at 18 C.F.R. pt. 37) (rule issued in tandem with Order 888 in order to facilitate information sharing).

148 FED. ENERGY REGULATORY COMM'N, ENERGY PRIMER: A HANDBOOK OF ENERGY MARKET BASICS 40 (2015), https://www.ferc.gov/market-oversight/guide/energy-primer.pdf [hereinafter ENERGY PRIMER].

149 *See* Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Services by Utilities, 61 Fed. Reg. 21,540 (Apr. 24, 1996) (to be codified at 18 C.F.R. pts. 35 and 385).

150 *See* Regional Transmission Organizations, 65 Fed. Reg. at 814–15.

In Order 2000, FERC urged utilities to increase the use of the ISO framework and set up RTOs to manage the grid on behalf of utilities that own transmission lines.[151] RTOs help promote efficiency by harnessing market incentives and promoting "efficient plant operations."[152] Those incentives also help encourage efficiency in the ways that plants operate by increasing the number of generators entering the market, resulting in more competition with existing generators.[153]

As a result of FERC's orders, RTOs and ISOs now manage the majority of electricity sales between load-serving entities and generators in the United States and help ensure reliable transmission in many parts of the country.[154] ISOs and RTOs set market prices by running auctions for energy, capacity, and ancillary services.[155] Energy services allow load-serving entities to obtain energy from generators as needed.[156] Capacity services ensure that there is enough generation capacity to reliably meet peak demand.[157] Ancillary services, such as frequency regulation and operating reserves, are necessary to help balance the electric grid as the electricity demand must equal electricity supply at all times.[158] End users of electricity pay for all three of these services, based on the rates set through the ISO and RTO auctions. FERC ensures that the resulting rates are just and reasonable by reviewing the auction rules as submitted by the wholesale market operators under section 205.[159]

The use of competitive market systems, such as auctions, helps ISOs and RTOs ensure reliability, balance supply and demand, provide competitive nondiscriminatory markets, and plan

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151 *See* N.J. Bd. of Pub. Utils. v. Fed. Energy Regulatory Comm'n, 744 F.3d 74, 82 (3d Cir. 2014).

152 Regional Transmission Organizations, 65 Fed. Reg. at 829.

153 *See id*.

154 *See id*.; ENERGY PRIMER, *supra* note 148, at 40 (explaining that "two-thirds of the nation's electricity load is served in RTO regions"). There is very little substantive difference between RTOs and ISOs. Both are "voluntary associations of the owners of transmission lines." N. J. Bd. of Pub. Utils, 744 F.3d at 82.

155 *See* ENERGY PRIMER, *supra* note 148, at 59; *see also* Morgan Stanley Capital Grp. Inc. v. Pub. Util. Dist. No. 1 of Snohomish Cty., 554 U.S. 527, 537 (2008).

156 *See* ENERGY PRIMER, *supra* note 148, at 59–61.

157 *See id.* at 61.

158 *See id.* at 36, 55, 74, 79–80.

159 *See* Hughes v. Talen Energy Mktg., LLC, 136 S. Ct. 1288, 1294 (2016).

for transmission needs.[160] Simplified for purposes of explanation, in the auctions, market operators ask generators for their bids to sell in the market, order these bids from lowest to highest, and start dispatching generators to meet the demand at a given time, taking into account any capacity limitations of the grid.[161] The bid of the last generator that is needed to meet the demand—in other words, the market clearing price—is then paid to all generators that are cleared.[162]

Because every resource that clears the auction receives the same market clearing price, and only those resources that clear the auction receive any payment, generators have an incentive to bid the lowest price they are willing to accept for producing one more unit—the marginal cost of production.[163] If generators bid higher than their marginal cost of production, they risk not being dispatched. Alternatively, if generators bid lower than their marginal cost of production, they risk losing money.[164] This inherent incentive means that only those generators that can produce and deliver electricity below the market clearing price—the marginal cost—are dispatched, and thus the auction minimizes the cost of serving all the customers while allocating economic resources only to the cheapest generators.

Although wholesale markets are administrative constructs, their design is intended to mimic perfectly competitive markets.[165] The auctions and other rules in energy markets are designed specifically to ensure that the market clearing price reflects the marginal cost of producing and delivering that last unit of electricity at a particular time and location, and to ensure that only those generators that can produce and deliver electricity at or

160 *See* ENERGY PRIMER, *supra* note 148, at 58.

161 *See* Fed. Energy Regulatory Comm'n v. Elec. Power Supply Ass'n, 136 S. Ct. 760, 763 (2016).

162 *See id.*

163 *See supra* Part I.B.

164 *See, e.g.*, Frequency Regulation Compensation in the Organized Wholesale Power Markets, 137 FERC ¶ 61,064, ¶ 128 (Oct. 20, 2011) (explaining that the auction system encourages "market participants to accurately bid their cost to provide the service" because a generator "that chooses to increase its offer price could find itself in a position of not being dispatched and, therefore, losing potential revenues").

165 *See supra* Part I.B.

below that price are dispatched.[166] In other words, the outcome of the market design will approximate the outcome of a perfectly competitive market. As FERC has explained, the auction "sends critical information to market participants, improves transparency, and generally results in more efficient outcomes in RTO/ISO energy markets."[167]

Further, energy and capacity markets, where they exist, are intended to give efficient price signals for economically efficient entry and exit, which ensures that generators are making normal economic profits in the long run.[168] If generators are making above-normal economic profits, new generators will enter. If generators are making below-normal profits, some will retire. Consequently, self-interested actions of generators ensure that "an economy's resources are fully used and allocated according to their best use," consistent with the outcome of perfectly competitive markets, as described in Part I.B, *supra.*

3. *Supervising Markets*

Markets rarely function as well as discussed above, though. Indeed, the much-idealized perfectly competitive markets rarely exist outside of academic textbooks. In many cases, there are market failures.[169] When these failures occur and markets are left to their own devices, price no longer reflects the social marginal cost.[170] In other words, market prices no longer signal the true social value of the goods; in those circumstances markets forces and individual actors' self-interests cannot ensure the most efficient allocation of society's resources—and regulation is necessary.[171]

Along with encouraging markets, FERC has long recognized such market failures and has intervened, as needed, "to break down

166 *See* Offer Caps in Markets Operated by Regional Transmission Organizations and Independent System Operators, 157 FERC ¶ 61,115 (2016) (to be codified at 18 C.F.R. pt. 35).

167 *Id.* ¶ 36.

168 *See supra* Part II.B.2.

169 *See* PINDYCK & RUBINFELD, *supra* note 12, at 611–13 (explaining that competitive markets will achieve an efficient allocation of resources).

170 *See id.*

171 *See* California *ex rel.* Lockyer v. Fed. Energy Regulatory Comm'n, 383 F.3d 1006, 1014 (9th Cir. 2004) (explaining that a market-based tariff is lawful as long as it is combined with enforceable reporting that enables FERC to determine "whether market forces were truly determining the price").

regulatory and economic barriers that hinder a free market in wholesale electricity"[172] and to ensure competition.[173] Only with market failures under control can FERC rely on the "invisible hand of the market" to set "rates that are just and reasonable."[174]

Competitive markets generally fail for four different reasons: (1) market power, (2) asymmetric information, (3) public goods, and (4) externalities.[175] Each of these market failures distorts the market price, moving it away from the social marginal cost and making a regulatory intervention necessary to restore efficiency. The manner in which FERC intervenes to correct any of these depends on the type of failure. This Part explains these four categories of market failures and shows that FERC has intervened to correct all of the standard market failures. In this way, it demonstrates how FERC's use of efficiency to achieve just and reasonable rates and prevent undue discrimination has set a precedent the Agency could rely on to use its broad powers under sections 205 and 206 of the FPA to correct the CO_2 emission market failure.

a. *Market Power*

FERC's efforts to prevent market power provide a commanding example of how it has addressed market failures in pursuit of just and reasonable rates. Market power is the ability of a consumer or a producer to affect the market price.[176] Market

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172 Fed. Energy Regulatory Comm'n v. Elec. Power Supply Ass'n, 136 S. Ct. 760, 768 (2016) (quoting Morgan Stanley Capital Grp. v. Pub. Util. Dist. No. 1 of Snohomish Cty., 554 U.S. 527, 536 (2008)); *see, e.g.*, Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Services by Public Utilities, 61 Fed. Reg. 21,540, 21,541 (May 10, 1996) (to be codified at 18 C.F.R. pts. 35 and 385) (breaking down the monopoly power of transmission line owners).

173 *See* Grid Reliability & Resilience Pricing, 162 FERC 61,012, ¶ 9 (2018).

174 Mont. Consumer Counsel v. Fed. Energy Regulatory Comm'n, 659 F.3d 910, 916 (9th Cir. 2011) ("Where sellers do not have market power or the ability to manipulate the market (alone or in conjunction with others), it is not unreasonable for FERC to presume that rates will be just and reasonable."); *see also* Michael A. Rosenhouse, Annotation, *Construction and Application of Mobile-Sierra Doctrine*, 62 A.L.R. Fed. 2d 427 (discussing the "presumption that a rate set in a freely negotiated contract passes the statutory 'just and reasonable' test").

175 *See* PINDYCK & RUBINFELD, *supra* note 12, at 612–13.

176 *See* KRUGMAN & WELLS, *supra* note 16, at 358; *see also* Citizens Power & Light Corp., 48 FERC ¶ 61,210, 61,777 (1989) ("Market power for a seller

power usually arises when there is a limited number of buyers or sellers. A firm without any other sellers to compete with can charge a price higher than the marginal cost without worrying about losing market share to competitors.[177] But when the market price deviates from the competitive level, some mutually beneficial transactions do not take place. In those circumstances, the social welfare is lower than what it could be and the market outcome is not economically efficient.

There are two types of market power: horizontal and vertical.[178] Horizontal market power occurs when a buyer (or seller) has a significant share of a market and therefore can affect the market price.[179] If a generator has a large enough market share, it can increase the market price for electricity by withholding generation capacity. Vertical market power occurs when a seller is involved in two or more activities, one of which is a necessary input for another, and can use its dominance in that first market to its advantage in the second market.[180] A transmission owner that also owns a generation firm can hamper the competitiveness of other generators by charging them high rates to use the lines, and hence improve the profits of its own generation firm.

In an effort to ensure just and reasonable rates, FERC has addressed both horizontal and vertical market power. For example, as FERC moved towards market-based rates and allowed sellers to "enter into freely negotiated contracts with purchasers,"[181] it required sellers to demonstrate that they lack both horizontal and vertical market power, thus ensuring that consumers have "genuine alternatives to buying the seller's product."[182] In other words, FERC demanded proof of a competitive market, with accurate price signals. According to FERC, a seller can show that it lacks market power if it can satisfy three conditions.[183] First, the seller

exists when the seller can significantly influence price in the market by withholding service and excluding competitors for a significant period of time.").

177 *See* PINDYCK & RUBINFELD, *supra* note 12, at 349–50.

178 *See* U.S. DEP'T OF ENERGY, HORIZONTAL MARKET POWER IN RESTRUCTURED ELECTRICITY MARKETS at v, http://www.energymarketers.com/Documents/DOE_Horizontal_MP-0308.pdf (last visited Sept. 13, 2018).

179 *See id.*

180 *See id.*

181 Morgan Stanley Capital Grp. Inc. v. Pub. Util. Dist. No. 1 of Snohomish Cty., 554 U.S. 527, 537 (2008).

182 Louisville Gas & Elec. Co., 62 FERC ¶ 61,016, 61,144 (1993).

183 *See id.* at ¶¶ 61,143–44.

must show that it is not a dominant firm in the relevant market.[184] Second, the seller must show that it does not own or control "transmission facilities through which the buyer could reach alternative sellers," or if it does own such facilities, it must show that it "has adequately mitigated its ability to block the buyer from reaching other sellers."[185] Third, the seller must show that it cannot control entry and exit of other firms into or out of the market.[186]

The first condition, lack of dominance, is related to horizontal market power. FERC addressed this in its rule adopting market-based rates. In the market-based rates rule, FERC instituted a 20 percent market share threshold as well as a screening tool that allows it to check for market power.[187] If a seller has a greater than 20 percent share of the market, it is likely to have an ability to affect the market price and therefore cannot be considered a price-taking firm, as is needed for perfect competition.[188]

The second and third conditions, related to entry and exit, require sellers to show that they lack vertical market power. Energy markets, by their nature, are especially susceptible to vertical market power. As FERC has recognized, the most likely way for a generator to exert market power is owning the transmission lines.[189] Without access to those transmission lines, other generators cannot otherwise sell electricity and compete in the market. Alternatively, if a firm controls the locations where new generation might be built,[190] that firm can make it harder for competitors to enter. Market power allows a firm to erect these barriers to entry.

Over the years, FERC has consistently used these two conditions to check for, and mitigate, vertical market power. For

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184 *See id.*

185 *Id.*

186 *See id.*

187 *See* Market-Based Rates for Wholesale Sales of Electric Energy, Capacity and Ancillary Services by Public Utilities, 119 FERC ¶ 61,295, ¶ 13 (2007).

188 *See supra* Part I.B (describing the principle of price-taking firms). Similarly, FERC uses the screening tool to evaluate the potential of a seller to exercise market power at peak demand times. *See* Market-Based Rates, 119 FERC ¶ 61,295, ¶ 77 (2007).

189 *See* Citizens Power & Light Corp., 48 FERC ¶ 61,210, 61,777(1989).

190 *See* Louisville Gas & Elec. Co., 62 FERC ¶ 61,016, 61,147 ("An important consideration in evaluating market power is ease of entry. Ease of entry can erode a firm's market power over time as new entrants compete away monopoly rents. Economic theory generally holds that market power is difficult to sustain over the long-run unless entry barriers exist.").

example, in 1989, when FERC analyzed whether Citizens Power should be permitted to use flexible market-based rates to sell energy on the wholesale market, FERC looked at Citizens Power's ability to exert market power.[191] In granting Citizens Power permission, FERC found that the firm lacked market power, because it did not own transmission facilities and was not affiliated with any owner of transmission facilities.[192] FERC also attached conditions to the use of market-based rates, requiring Citizens Power to notify FERC if those circumstances changed and to make informational filings describing "its purchase and sale contracts for generation and transmission" so that FERC could monitor whether the company was acquiring the ability to exercise vertical market power.[193] With those conditions, FERC found that the flexible market-based rates Citizens Power proposed were permissible under the FPA.[194]

Five years later, FERC addressed a similar but broader request from Heartland Energy Services, Inc. to use market-based rates.[195] Heartland was an electric power marketing company, which bought and sold electricity.[196] The difference with Heartland was that, unlike Citizens Power, Heartland was affiliated with an electric utility that controlled generation and transmission.[197] FERC nonetheless allowed Heartland to use market-based rates as long as its affiliate allowed competitors to access its transmission services.[198]

Following those orders, in the 1990s, FERC took a broader approach to correcting for vertical market power. In 1996, FERC issued Order 888, under its section 206 authority, which directs transmission owners to allow competitors to access their transmission lines and directs transmission providers to offer service to all customers equally.[199] The rule was designed to

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191 *See* Citizens Power & Light Corp., 48 FERC ¶ 61,210, 61,777 (1989).

192 *See id.*

193 *See id.* at 61,778.

194 *See id.* at 61,779.

195 *See* Heartland Energy Servs., Inc., 68 FERC ¶ 61,223, 62,052 (1994).

196 *See id.* at 62,052.

197 *See id*. at 62,060.

198 *See id.* at 62,064.

199 Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Services by Public Utilities, 61 Fed. Reg. 21,540, 21,560 (May 10, 1996).

remove barriers to competition and improve efficiency in the electricity market.[200]

In 1999, following Order 888, FERC found that utilities were still discriminating and began a new rulemaking to address that discrimination.[201] A year later, FERC issued Order 2000—invoking both its authority to prevent undue discrimination and to ensure just and reasonable rates[202]—which encouraged transmission providers to establish RTOs.[203] This step allowed FERC to "pry open" the market and reduce inefficiencies caused by too many different utilities operating different parts of the grid separately.[204] Order 2000 also reaffirmed the requirement that utilities seeking to use market-based rates need to demonstrate that market power had been mitigated and that no other barriers to entry exist.[205]

FERC's actions to address market power have not been limited to sellers. FERC has also addressed buyer-side market power, known as monopsony.[206] Owners of generation capacity sometimes also buy capacity. If a seller buys enough to outweigh the capacity it owns, in other words, if the seller is a "net buyer", that seller may have incentives to try to depress market clearing prices below competitive levels.[207] As a net buyer, a seller can depress market prices by offering its own capacity for sale below the cost of providing it.

To address buyer-side market power concerns raised by this situation, FERC approved use of PJM's "Minimum Offer Price Rule."[208] The Minimum Offer Price Rule "mitigates" the effect of buyer-side market power by requiring any net buyers to submit a higher bid when those sellers would otherwise be able to suppress

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200 *See id.* at 21,541.

201 *See* Regional Transmission Organizations, 64 Fed. Reg. 31,390, 31,391 (proposed May 13, 1999).

202 *See* Regional Transmission Organizations, 65 Fed. Reg. 810, 840 (Dec. 20, 1999) (to be codified at 18 C.F.R. pt. 35).

203 *See* Morgan Stanley Capital Grp. Inc. v. Pub. Util. Dist. No. 1 of Snohomish Cty., 554 U.S. 527, 536 (2008) (citing Regional Transmission Organizations, 65 Fed. Reg. at 840).

204 *See id.*

205 *See* Regional Transmission Organizations, 65 Fed. Reg. at 840.

206 *See, e.g.*, PJM Interconnection, L.L.C., 117 FERC ¶ 61,331 (2006).

207 *See id.* ¶ 103.

208 *Id.* ¶ 104.

market prices.[209] For example, when PJM first designed its Minimum Offer Price Rule, an offer would be mitigated if the offer price was (1) sizable enough to depress capacity market clearing prices by more than 20 or 30 percent (depending on resource) or by more than $25/MWh, and (2) was offered by an entity that purchased more capacity than it sold.[210] FERC found that the Minimum Offer Price Rule was a reasonable way of making sure that net buyers were not able to exercise "monopsony power by seeking to lower prices through self-supply."[211] Courts have held that FERC generally has the authority to approve Minimum Offer Price Rules.[212]

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209 *See* NextEra Energy Res., LLC v. Fed. Energy Regulatory Comm'n, 898 F.3d 14, 18 (D.C. Cir. 2018); PJM Interconnection, L.L.C., 117 FERC ¶ 61,331, ¶ 103 (2006) ("Subject to certain exemptions, if the supply offer of a net buyer falls below certain specified levels, and if its net purchases exceed certain specified levels, and if it does not convince the PJM Market Monitor that the offer is cost-justified, the Market Monitor may establish an alternative higher bid. The alternative bid would equal 90 percent of the Market Monitor's estimate of the bidder's Net Asset Class Cost of New Entry (or, if this cost is not available, 80 percent of the Net Cost of New Entry for the Reference Resource).").

210 *See* N.J. Bd. of Pub. Utils. v. Fed. Energy Regulatory Comm'n 744 F.3d 74, 85 (3d Cir. 2014) (describing PJM's rule); PJM, PJM MANUAL 18: PJM CAPACITY MARKET 37 (2018), http://www.pjm.com/-/media/documents/manuals/m18.ashx; PJM, PJM OPEN ACCESS TRANSMISSION TARIFF 2912 (2010), https://www.pjm.com/directory/merged-tariffs/oatt.pdf; *see also* NextEra Energy Res., LLC v. Fed. Energy Regulatory Comm'n, 898 F.3d 14, 18 (D.C. Cir. 2018) (describing rule in ISO New England).

211 PJM Interconnection, L.L.C., 117 FERC ¶ 61,331, ¶ 104 (2006). Since its inception, PJM has revised the design and the aim of the Minimum Offer Price Rule significantly and now uses the rule to "mitigate" state public policies. The use of the rule for that purpose is economically inefficient. *See* SYLWIA BIALEK & BURCIN UNEL, INST. FOR POLICY INTEGRITY, CAPACITY MARKETS AND EXTERNALITIES: AVOIDING UNNECESSARY AND PROBLEMATIC REFORMS 1 (2018), http://policyintegrity.org/publications/detail/capacity-markets-and-externalities.

212 *See* New England Power Generators Ass'n v. Fed. Energy Regulatory Comm'n, 757 F.3d 283, 286–87 (D.C. Cir. 2014) (finding that FERC has authority to approve an ISO's rule subjecting a new generator to the Minimum Offer Price Rule in order to mitigate the new generators' ability to depress prices). Though the Minimum Offer Price Rule began as a reasonable effort to combat "true attempts to exercise buyer-side market power," recently, it has "morph[ed]" into "an examination of whether states have provided support or a subsidy to a resource that is selling into the capacity market." ISO New England Inc., 158 FERC ¶ 61,138, 61,892 (2017) (Bay, C., concurring). Under that theory, new renewable resources that had received state subsidies should be mitigated because those resources may be able to submit below-cost bids into the capacity auction and artificially suppress capacity prices. *See, e.g.*, Request for Rehearing of Nextera Energy Resources LLC, the PSEG Companies and the

b. *Asymmetric Information*

FERC has also addressed asymmetric information to ensure efficient electricity markets. Asymmetric information occurs in situations where one or more market participants have information not available to other participants, which they can exploit to their benefit.[213] Asymmetric information can lead to market failure in several ways, including through "adverse selection" and "moral hazard."

Adverse selection arises when there is hidden information. If buyers do not have sufficient information about the true quality of a good, too many low-quality products and too few high-quality products could be sold in the market.[214] For example, when generators are paid the same amount regardless of their actual performance, cheaper and less reliable generators will likely be selected more often than more expensive yet reliable ones.

Moral hazard arises when the actions of one party cannot be perfectly observed and others bear the costs of that party's lack of care or effort.[215] For example, when generators can recover all their costs through regulated rates, they may be tempted to take riskier positions than are wise and shift the risks of their actions to ratepayers. As a result, the trades that take place may not be mutually beneficial and some mutually beneficial trades may be missed. Hence, when there is asymmetric information, the market outcome is inefficient.

Information asymmetry between regulators and the regulated entity creates perverse incentives for the latter. When a regulated entity's profits depend on its private information, such as its costs, it may have an incentive to manipulate or misstate that information, at the expense of customers. Sometimes it is not possible for either the regulator or the regulated entity to have perfect information to combat that manipulation. For example,

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NRG Companies, ISO New England Inc. and New England Power Pool Participants Committee at 23 (2016) (FERC No. ER14-1639-004). This use of the Minimum Offer Price Rule is problematic because it puts FERC "in constant tension with the states." *See* ISO New England Inc., 158 FERC ¶ 61,138, 61,893 (Bay, C., concurring).

213 *See* KRUGMAN & WELLS, *supra* note 16, at 559–60. Economists have varying names for this market failure, including "private information," *id.*, and "asymmetric information," PINDYCK & RUBINFELD, *supra* note 12, at 617.

214 *See* PINDYCK & RUBINFELD, *supra* note 12, at 617–20.

215 *See id.* at 628; KRUGMAN & WELLS, *supra* note 16, at 562.

because of unexpected price spikes in natural gas markets, the realized costs of a resource might be different than its ex-ante cost expectation and hence its bid into the wholesale markets might be significantly different than the realized cost of generation.

FERC has addressed many cases of asymmetric information under its authority to ensure just and reasonable rates. In a case involving the Idaho Power Company, FERC explained that allowing the firm to recover costs without any checks could remove incentives to contain costs.[216] To address this issue, a FERC administrative law judge ordered the company to submit a section 205 filing for any rate increase that exceeded a specified level and indicated that the company had the burden of showing that the resulting rate was just and reasonable.[217]

FERC has also addressed problems related to adverse selection and moral hazard in capacity markets. The market operator that runs wholesale markets in New England (ISO-NE) had a rule that allowed "available" resources to receive payments from the capacity markets.[218] The problem was that under ISO-NE's rules, there were several exemptions allowing resources that were not actually available to be deemed as such and collect payments.[219] This feature failed to encourage performance and rewarded "less reliable resources over more reliable resources," because generators that failed to improve services could still offer lower bids and receive payments.[220] These perverse incentives led to shortages and a sharp increase in unplanned outages.[221] FERC thus determined that ISO-NE should clearly link capacity payments with real-time performance and reward generators that were actually able to perform during shortages.[222]

In another context, FERC approved a hard cap for energy market offers to address the fact that utilities might have imperfect information about the short-run marginal costs of different

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216 *See* Idaho Power Co., 120 FERC ¶ 63,014, ¶¶ 252–53 (2007).

217 *See id.* ¶ 254.

218 ISO New England Inc. & New England Power Pool, 147 FERC ¶ 61,172, ¶ 29 (2014).

219 *See id*.

220 *See id.* ¶ 26.

221 *See id.*

222 *See id.* ¶ 36.

resources when verifying incremental energy offers above $1,000/MWh.[223]

The Enron scandal also provides an example of this market failure. In the period between 1997 and 2003, Enron failed to disclose to FERC many affiliate relationships, which had allowed it "to control assets and obtain sensitive commercial information."[224] As a result of keeping that information hidden, Enron was able to engage in multiple schemes to manipulate the market "by sending false price signals to other market participants and making the market at particular points appear more liquid" than it really was.[225] In response, FERC invoked its authority under sections 205 and 206 "to protect electricity customers from unjust and unreasonable rates" and revoked Enron's market-based rate authority.[226] FERC also ordered Enron to disgorge $1.6 billion in "unjust profits" obtained through the schemes.[227]

FERC has recognized information problems in the natural gas context as well. For example, in gas pipeline sales, parties may be more willing to engage in speculative financing when they can shift the risks of that financing to ratepayers. In response, FERC recognizes only the "net book value" of the pipelines—the original purchase price "less its accumulated depreciation, depletion and amortization"[228]—rather than the price that parties negotiate for the facility on the open market.[229] Recognizing only the "net book value" helps minimize any risk that the firm would engage in "speculative financing and debt leveraging."[230] As FERC explained, allowing the risks of speculative financing to be placed on ratepayers creates a moral hazard that can threaten the future of the firm "if and when" an "overleveraged 'bubble' bursts."[231] Through this rule, FERC ensures that shareholders that are in a position to decide whether to bear the risk actually bear it.[232]

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223 *See* Offer Caps, 157 FERC ¶ 61,115, ¶ 53 (2016) (to be codified at 18 C.F.R. pt. 35).

224 Enron Power Mktg., Inc., 119 FERC ¶ 63,013, ¶ 28 (2007).

225 Enron Power Mktg., Inc. & Enron Energy Servs., Inc., 103 FERC ¶ 61,343, ¶ 68 (2003).

226 *Id.* ¶ 2.

227 Enron Power Mktg., Inc., 126 FERC ¶ 61,230, ¶ 3 (2009).

228 Mo. Interstate Gas, LLC, 137 FERC ¶ 63,014, ¶ 99 (2011).

229 *See id*.

230 *Id*. ¶ 103.

231 *Id*.

232 *See id.*

As a final example of FERC efforts to address information asymmetry, in 2003, FERC concluded that natural gas price indices based on information voluntarily reported by natural gas traders were inaccurate because the reports had been false.[233] And because many distribution companies or consumers who bought directly from the traders relied on the price indices, the manipulation of information helped raise the prices consumers and resellers paid to "extraordinary levels."[234] To help correct this problem, FERC issued a Code of Conduct to amend all blanket certificates to prohibit sellers "from engaging in actions without a legitimate business purpose that manipulate or attempt to manipulate market conditions."[235]

c. *Public Goods*

Public goods are another important market failure that FERC has addressed. Public goods are special types of goods that have two characteristics. First, they are "non-excludable," because the supplier cannot prevent people who have not paid for the goods from consuming them.[236] Second, public goods are "non-rival in consumption," because more than one person can consume the same unit of good at the same time.[237] When consumers can benefit without paying, public goods create a free rider problem.[238] And with free riders, suppliers are unlikely to invest in providing that good. As a result, without intervention, the market is unable to provide the socially efficient level of a public good.[239]

Grid reliability is a typical example of a public good.[240] When the grid is reliable, all users benefit from that reliability, even if they did not pay for the improvements. Thus, without regulation, it

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233 *See* Oneok, Inc. v. Learjet, Inc., 135 S. Ct. 1591, 1597 (2015).

234 *Id.* at 1598 (internal quotation marks omitted).

235 Amendments to Blanket Sales Certificates, 68 Fed. Reg. 66,324, 66,324 (Nov. 17, 2003) (to be codified at 18 C.F.R. pt. 284).

236 *See* KRUGMAN & WELLS, *supra* note 16, at 461.

237 *See id.*

238 *See* PINDYCK & RUBINFELD, *supra* note 12, at 678–79.

239 *See id.*; *see also* Rossi, *supra* note 35, at 291 (explaining that "competitive interstate energy markets have failed to price important public goods").

240 *See* FENG ZHAO, ET. AL., ISO NEW ENGLAND, PRESENTATION AT FERC CONFERENCE: DEMAND CURVES IN FORWARD CAPACITY MARKET (FCM) 6 (June 27–29, 2016), https://www.ferc.gov/CalendarFiles/20160804133957-3%20-%20DemandCurvesFCM_FengZhao.pdf (explaining that "reliability is treated as a public good").

is unlikely that suppliers would provide the good at socially efficient levels. FERC has long taken steps to address grid reliability. For example, it has directed wholesale market operators to plan and direct "expansions and upgrades" of the grid and to finance those activities through a fee added to "the price of wholesale electricity transmitted on the grid."[241] Those fees must be just and reasonable and "at least roughly proportionate to the anticipated benefits to a utility of being able to use the grid."[242]

In exercising its authority over this area, FERC found that it was just and reasonable to spread the costs of upgrades that were "designed to preserve the grid's reliability," explaining that those benefits are felt throughout the entire system.[243] Similarly, in an effort to expand transmission, FERC authorized credits to generators for "short-circuit and stability network upgrades," on the ground that those upgrades would help expand the transmission system and "benefit all users."[244] In another example, FERC allowed Western Massachusetts Electric Co. to roll the cost of grid upgrades into its transmission rates after showing that the upgrades performed "a system-wide function" and provided "benefits to all customers on the grid."[245]

More recently, FERC's authority to correct market failures related to public goods came up in the context of an intense debate over the Department of Energy's plan to compensate certain plants

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241 Ill. Commerce Comm'n v. Fed. Energy Regulatory Comm'n, 721 F.3d 764, 770 (7th Cir. 2013) (citing 18 C.F.R. §§ 35.34(k)(1), (7)).

242 *Id*.

243 Entergy Servs., Inc. v. Fed. Energy Regulatory Comm'n, 319 F.3d 536, 543–45 (D.C. Cir. 2003) (internal quotation marks and alteration omitted).

244 *Id*. at 542; *see also Ill. Commerce Comm'n*, 721 F.3d at 774 (upholding FERC's decision to distribute the cost of adding new wind power to the grid equally because those new resources would benefit the "entire regional grid by reducing the likelihood of brownouts or outages, which could occur anywhere on it"); Ill. Commerce Comm'n v. Fed. Energy Regulatory Comm'n, 756 F.3d 556, 558 (7th Cir. 2014) (noting the possibility that western utilities might "benefit from the new high-voltage transmission lines in PJM's eastern region, and to the extent they do they can be required to contribute to the cost of building the new lines," and remanding for more empirical analysis); Midwest Indep. Transmission Sys. Operator, Inc., 133 FERC ¶ 61,221, 62,098 (2010) (determining that the benefits from new lines would be spread uniformly across utilities).

245 W. Mass. Elec. Co. v. Fed. Energy Regulatory Comm'n, 165 F.3d 922, 927 (D.C. Cir. 1999).

for their ability to maintain a ninety-day supply of fuel on site.[246] According to the Department of Energy, maintaining onsite fuel was crucial to grid "resiliency," and plants that could provide this service were receiving inadequate compensation.[247]

While the question of whether FERC had an adequate record to support such payments was very controversial, there was no dispute over FERC's theoretical ability to remedy a market failure by pricing resilience. Ultimately, FERC terminated the proceeding, holding that neither the proposed rule nor the record demonstrated that existing rates were unjust and unreasonable, or that the remedy the Department of Energy proposed was just and reasonable.[248] FERC then directed ISOs and RTOs to submit comments addressing whether their markets provide enough resilience, how resilience is addressed in existing market-based mechanisms, and how, if at all, these market-based mechanisms should be modified to "better address resilience."[249] But despite vigorous debate over whether the evidence supported the need for the proposed rule, those submissions generally recognized FERC's theoretical authority to address resilience.[250]

d. *Externalities*

FERC has also addressed externalities (at least in part). An externality is the unaccounted-for cost or benefit imposed on third

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246 *See* Grid Resiliency Pricing Rule, 82 Fed. Reg. 46,940, 46,945 (proposed Oct. 10, 2017) (to be codified at 18 C.F.R. pt. 35).

247 *Id.* at 46,942 ("There is a growing recognition that organized markets do not necessarily pay generators for all the attributes that they provide to the grid, including resiliency. Because wholesale pricing in those markets does not adequately consider or accurately value those benefits, fuel-secure generation resources are often not compensated for those benefits.").

248 *See* Grid Reliability & Resilience Pricing, 162 FERC ¶ 61,012, ¶ 14 (2018).

249 *Id.* ¶ 27.

250 *See, e.g.*, Amanda Durish Cook et al., *RTO Resilience Filings Seek Time, More Gas Coordination*, RTO INSIDER (March 11, 2018) (summarizing comments), https://www.rtoinsider.com/ferc-iso-ne-resilience-gas-electric-coordination-88190; Comments of the Electric Power Supply Ass'n at 6, Docket No. AD18-7-000 (May 9, 2018), https://elibrary.ferc.gov/idmws/file_list.asp?accession_num=20180509-5131 ("FERC has the responsibility and authority to ensure that effective competition will achieve a secure, reliable, and resilient 'all of the above' electricity system."); *see generally* BURCIN UNEL & AVI ZEVIN, INST. FOR POLICY INTEGRITY, TOWARD RESILIENCE, DEFINING, MEASURING, AND MONETIZING RESILIENCE IN THE ELECTRICITY SYSTEM (Aug. 1, 2018), https://policyintegrity.org/publications/detail/toward-resilience.

parties by a market transaction not borne by the parties engaged in the transaction.[251] A negative externality, such as CO_2 emissions by fossil fuel-fired plants, imposes climate damages on society at large.[252] A positive externality, such as reducing the likelihood of others being infected when vaccinated, creates benefits enjoyed by the whole society.[253] Because these costs or benefits are not incurred directly by the parties making market decisions, the resulting price of the good does not reflect the true social value of the good. That leads to a market outcome that is socially inefficient.[254]

When externalities are present, they must be fully "internalized" to reach economic efficiency.[255] Internalizing the externality means that the parties of the deal bear those costs and benefits.[256] The prices in this case "must reflect all the (marginal) costs of production and consumption—not only those borne directly by the transacting parties but also those that may be foisted on outsiders."[257] Once the costs are internalized and prices reflect them, parties will enter into a different, welfare-maximizing transaction. To ensure that parties internalize an externality, a regulator can impose a tax in the amount of the external damage (when the externality is negative) or a subsidy in the amount of the external benefit (when the externality is positive).[258]

FERC has addressed externalities, just as it has the other three market failures discussed, in an effort to promote economic efficiency. For example, network congestion is an important externality that affects the justness and the reasonableness of wholesale rates.[259] When a limited capacity resource such as a transmission network is used, increased demand by one customer at times when the transmission network is close to its capacity

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251 *See* KRUGMAN & WELLS, *supra* note 16, at 437.

252 *See id*.

253 *See id.*

254 *See* PINDYCK & RUBINFELD, *supra* note 12, at 315–16, 645.

255 *See* KRUGMAN & WELLS, *supra* note 16, at 438.

256 *See* ALFRED E. KAHN, THE ECONOMICS OF REGULATION: PRINCIPLES AND INSTITUTIONS 69 (1988).

257 *Id.*

258 *See* KRUGMAN & WELLS, *supra* note 16, at 442–44, 450. In the context of CO_2 emissions, this principle would prescribe an economy-wide carbon tax on all polluters.

259 *See* PINDYCK & RUBINFELD, *supra* note 12, at 139; *see also* KRUGMAN & WELLS, *supra* note 16, at 437 (describing traffic congestion as an externality).

limit might mean that another customer cannot be served. If these customers do not pay for the congestion costs that their increased demand creates, then the amount of electricity they demand may be higher than the socially efficient level, leading to a higher-than-socially-efficient level of congestion. On the other hand, if market prices during high-demand times were to increase to reflect the fact that the network is congested, then these customers may face price signals that better reflect the societal cost of their incremental demand and likely reduce their demand, as some customers may reach the point where the cost is no longer worth the benefit. In other words, internalizing the negative externality related to network congestion leads to a more efficient level of generation.

Market operators have developed Locational Marginal Prices (LMPs) to address this externality and ensure that energy prices reflect the true cost of delivering electricity to a particular location, including the opportunity costs related to the physical limits of the transmission system and the cost of generating electricity.[260] The LMP approach allows the market to take into account "the opportunity costs of using congested transmission paths."[261] LMPs reflect the cost of generating enough electricity to serve the demand at a particular time and location.[262] As the demand at a particular location increases, the network that transmits energy to that location becomes increasingly congested, and it may not be possible to transmit electricity from the least-cost generator to serve the demand at that location.[263] At such times, the LMPs increase to reflect the constraints of the transmission system (in addition to the changes in price due to increased costs of generating electricity).[264]

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260 *See* Pa.-N.J.-Md. Interconnection Atl. City Elec. Co., 81 FERC ¶ 61,257, 62,253-56 (1997) (approving PJM's locational marginal pricing model); Sacramento Mun. Util. Dist. v. Fed. Energy Regulatory Comm'n, 616 F.3d 520, 524–26 (D.C. Cir. 2010) (discussing the history of California's implementation of locational marginal pricing).

261 Pa.-N.J.-Md. Interconnection Atl. City Elec. Co., 81 FERC ¶ 61,257, 62,253-56 (1997).

262 *See* ENERGY PRIMER, *supra* note 148, at 60.

263 *See id.*

264 *See, e.g.*, Eisen, *supra* note 30, at 1828 (explaining how "transmission planning [is] a 'practice affecting rates'" and within FERC's authority to regulate, because a system "with less transmission is more congested—and produces more expensive rates for delivered electricity").

In this way, LMPs help "promote efficient use of the transmission grid, promote the use of the lowest-cost generation, provide for transparent price signals, and enable transmission grid operators to operate the grid more reliably."[265] Courts have upheld FERC's reliance on LMPs, as LMPs give "market participants incentives to avoid congestion-causing transactions" and are "more economically efficient," allowing "scarce transmission capacity" to be "allocated to those who value it most instead of being physically rationed."[266] As this discussion shows, using the LMP is an attempt to internalize the congestion cost. This example, combined with all the other examples of FERC addressing market failures described above, shows how FERC has invoked market efficiency in numerous ways over the years to address market failures as it works to comply with its statutory duty to ensure just and reasonable rates and prevent undue discrimination.

III. AUTHORITY TO ADDRESS EXTERNALITIES RELATED TO CARBON DIOXIDE EMISSIONS

Given FERC's long history of addressing market failures, the crucial question is whether it has authority to correct the externality that results from CO_2 emissions. It is well-settled that FERC may not act unless it has "authority delegated" to it by Congress.[267]

As explained in Part I, Congress tasked FERC with ensuring just and reasonable rates as well as correcting undue discrimination. FERC's authority in this area extends to regulating any rules or practices that "directly affect the wholesale rate."[268] Part II demonstrated how FERC has fully embraced the principles of economic efficiency in its efforts to ensure just and reasonable rates. This Part explains how internalizing the external cost of CO_2 emissions would help correct a market failure and prevent undue

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265 Cal. Indep. Sys. Operator Corp., 116 FERC ¶ 61,274, 62,136 (2006).

266 Wis. Pub. Power, Inc. v. Fed. Energy Regulatory Comm'n, 493 F.3d 239, 250–51 (D.C. Cir. 2007).

267 *See e.g.*, Clean Air Council v. Pruitt, 862 F.3d 1, 9 (D.C. Cir. 2017) (quotation marks omitted); *accord* Maine v. Fed. Energy Regulatory Comm'n, 854 F.3d 9, 24 (D.C. Cir. 2017) ("As a creature of statute, FERC has only those powers endowed upon it by statute." (internal quotation marks omitted)); *Cal. Indep. Sys. Operator Corp.*, 372 F.3d at 398 (internal quotation marks omitted).

268 Fed. Energy Regulatory Comm'n v. Elec. Power Supply Ass'n, 136 S. Ct 760, 774 (2016) (internal quotation marks omitted).

discrimination. Seen from an economic perspective, FERC should have the authority to address issues that directly affect the efficiency of rates and services, which includes addressing the direct impact the external cost of CO_2 emissions has on rates.[269]

Externalities, if not internalized, create a discrepancy between the market price and the socially efficient price (the social marginal cost). When generators emit CO_2 and cause damages to society, they do not incur any (or incur minimal) additional cost themselves, and they will thus make bids and generation decisions based on their lower private costs. When this happens, the resulting market price will only reflect the private costs to generators and not the external cost of CO_2 emissions. As a result, the market price will be lower than the social marginal cost of producing electricity.[270]

As explained above, production decisions are made using a marginal analysis, where producers compare marginal costs to the price they receive for each megawatt-hour—the marginal benefit.[271] Therefore, when there are external costs, the generation mix will be decided based on this (low) market price, and fossil fuel-fired generators will be paid to generate electricity that is costlier to society than the market price. In other words, from society's perspective, electricity will not be generated by the lowest-cost suppliers, which will lead to a higher than socially desirable level of electricity generation (and, hence, pollution) from fossil fuel-fired generators.[272] Further, because the average private cost of production is less than the average social cost, some

269 *See* Todd S. Aagaard, *Energy-Environment Policy Alignments*, 90 WASH. L. REV. 1517, 1533 (2015) ("A rational regulatory approach . . . would pursue an efficient market that would be both competitive and would internalize externalities."); Eisen, *supra* note 30, at 1783 (FERC's jurisdiction extends to the terms and conditions of the operation of wholesale markets that affect the markets directly and significantly); Miss. Indus. v. Fed. Energy Regulatory Comm'n, 808 F.2d 1525, 1553 (D.C. Cir. 1987), *vacated in part on other grounds*, 822 F.2d 1103 (D.C. Cir. 1987) (upholding FERC's jurisdiction over capacity that directly affects costs and thus rates); Municipalities of Groton v. Fed. Energy Regulatory Comm'n, 587 F.2d 1296, 1296 (D.C. Cir. 1978); Cal. Indep. Sys. Operator Corp., 119 FERC ¶ 61,076, ¶¶ 540–56 (2007) (finding that maintaining adequate resources falls within Commission jurisdiction because it has a direct and significant effect on wholesale rates and services); ISO New England, Inc., 119 FERC ¶ 61,161, ¶¶ 18–30 (2007) (same).

270 See *supra*, Part I.B.

271 *See id.*

272 *See, e.g.*, Simeonov, *supra* note 25 at 334.

firms remain in the market even though it would be more socially efficient for them to exit.[273]

Because of the external cost, the bids of certain higher-emitting resources are lower than they would be in a socially efficient market. Therefore, not imposing a carbon price distorts the value of emitting resources relative to non-emitting resources. Failing to recognize the external cost of CO_2 emissions thus poses an undue disadvantage to generation sources that do not entail a similarly high external cost, because those resources are not compensated correctly.[274]

Solving these problems through a carbon price would change the market price to reflect the true social cost of generating electricity.[275] In that way, a carbon price would align markets so that they accurately take this externality into account and appropriately remove an unreasonable barrier to development of generation that is less socially costly. As a result, outcomes would be more economically efficient "with the markets themselves determining the appropriate mix of resources."[276] As FERC explained in the context of demand response programs, which reduce demand for electricity at certain peak times: "while the level of compensation provided to each resource affects its willingness and ability to participate in the energy market," ultimately the markets would determine the mix of generation needed to serve demand.[277]

Traditionally, FERC has pursued rates that match "as closely as practicable, the costs to serve each class or individual customer"[278] and used market efficiency to achieve that result.[279]

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273 *See* PINDYCK & RUBINFELD, *supra* note 12, at 648.

274 *See, e.g.*, Demand Response Compensation in Organized Wholesale Energy Markets, 76 Fed. Reg. 16,658, 16,664 (2011) (to be codified at 18 C.F.R. pt. 35) (describing concerns that fossil-fuel priced generation is mispriced).

275 *See* Catherine M.H. Keske et al., *Total Cost Electricity Pricing: A Market Solution for Increasingly Rigorous Environmental Standards*, 25 ELECTRICITY J. 7 (2012) (describing Colorado's experience with one type of "adder" program); *see also* Bateman & Tripp, *supra* note 36, at 329 (describing an approach that would internalize the cost of carbon in the wholesale markets).

276 Demand Response Compensation in Organized Wholesale Energy Markets, 76 Fed. Reg. at 16,668, n.59.

277 *Id.*

278 *See, e.g.*, Elec. Consumers Res. Council v. Fed. Energy Regulatory Comm'n, 747 F.2d 1511, 1514 (D.C. Cir. 1984) (internal quotation marks omitted).

But without correcting the CO_2 externality market failure, which imposes a significant external cost on society, purchasers of electricity cannot "fully realize costs associated with the production and consumption of electric power."[280] Ignoring the externality ignores the need to take into account the true cost of serving customers.[281] Markets fail to achieve efficiency in the presence of externalities, just as they do when there is market power, asymmetric information, or public goods.[282] And any effort to achieve just and reasonable rates through market efficiency is incomplete unless it accounts for all the direct social costs of generation.

Because the CO_2 externality is directly related to the social marginal cost of electricity generation, and thus to the efficient wholesale rate, the argument that FERC does not have jurisdiction to address CO_2 emissions because they are an environmental issue[283] misses the mark. As the Court's decision in *FERC v. Electric Power Supply Ass'n (EPSA)* makes clear, whether the decision has environmental consequences is not the guiding

279 *See* Fed. Energy Regulatory Comm'n v. Elec. Power Supply Ass'n, 136 S. Ct. 760, 779 (2016) (explaining that FERC's "mission" is to "improve the competitiveness, efficiency, and reliability of the wholesale market").

280 Simeonov, *supra* note 25, at 334.

281 *See id.* ("[I]t is inconsistent for a regulatory agency claiming to achieve 'just and reasonable' rates to ignore the costs of such pollution effects on the environment and human health."); Jeremy Knee, *Rational Electricity Regulation: Environmental Impacts and the "Public Interest,"* 113 W. VA. L. REV. 739, 766 (2011) ("[I]t is virtually impossible to minimize total costs if a substantial portion of costs are left out of the calculation."); *see also* Rossi, *supra* note 35, at 6 ("[M]arket prices in energy often fail to reflect actual value."); ALISON CASSADY ET AL., CTR. FOR AM. PROGRESS, BUILDING A 21ST CENTURY ECONOMY: THE CASE FOR PROGRESSIVE CARBON TAX 1 (Dec. 2016), https://cdn.americanprogress.org/content/uploads/2016/12/15130607/CarbonTax-report.pdf ("Climate change is a classic market failure."); Weissman & Webb, *supra* note 37, at 3 ("Due to the presence of these externalities, market-based electricity rates are arguably not just and reasonable").

282 *See* KRUGMAN & WELLS, *supra* note 16, at 437; *see also* Weissman & Webb, *supra* note 37, at 6 ("The existence of environmental externalities represents another kind of market failure to which FERC could also respond by adjusting the bid price.").

283 *See, e.g.*, Moot, *supra* note 38, at 348 (arguing that any action by FERC to put a price on CO_2 emissions would "constitute a jurisdictional bridge too far"); GUNDLACH & WEBB, *supra* note 126, at 2 ("Many view climate change as an environmental externality whose attendant costs lay beyond the scope of what ought to inform FERC's assessment of wholesale rates' justness and reasonableness."). *But see* Bateman & Tripp, *supra* note 36, at 279 (arguing that FERC has authority to "consider environmental factors in its rate regulation").

principle when examining if FERC has authority.[284] After all, the *EPSA* case approved demand response programs, which might also have an environmental benefit by decreasing the need for emission-intensive generators.[285] But rather than focusing on the environmental aspect, the court focused on the ability of demand response to improve reliability and bring down the marginal cost.[286] The principle that should guide FERC's decision to regulate is whether FERC is regulating a practice "that directly affect[s] the wholesale rate" and not whether the decision has environmental implications.[287]

The cases that discuss the question of FERC's authority to consider environmental impacts help illustrate this distinction. In *PSI Energy, Inc.*, petitioners argued that there were "siting, health, safety, environmental [and] archaeological problems" associated with an interconnection agreement and that FERC should consider those issues before approving the agreement.[288] FERC rejected that argument explaining that it does not have "siting or certification authority with respect to transmission lines" and that health risks should be dealt with by the agencies that have jurisdiction over those issues.[289] Similarly, in *Crees*, plaintiffs argued that authorizing Hydro-Quebec "to sell power at market-based rates will lead to an increase in Hydro-Quebec's exports, which will in turn lead to the construction of new hydroelectric facilities, which 'will destroy fish and wildlife upon which Cree fishermen, trappers and hunters depend.'"[290] But the D.C. Circuit found that plaintiffs did not have standing, because FERC's ratemaking authority did not extend to such a long chain of environmental effects.[291]

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284 *See Elec. Power Supply Ass'n*, 136 S. Ct. at 774 (explaining the "directly affect" test).

285 *See id.* at 767; Aagaard, *supra* note 269, at 1557 (explaining that FERC found that demand response programs would have "possible environmental benefits") (citing FED. ENERGY REGULATORY COMM'N, ASSESSMENT OF DEMAND RESPONSE & ADVANCED METERING 5 (2008), http://www.ferc.gov/legal/staff-reports/demand-response.pdf).

286 *See Elec. Power Supply Ass'n*, 136 S. Ct. at 774.

287 *See id.*

288 *See* PSI Energy, Inc., 55 FERC ¶ 61,254, 61,811 (1991).

289 *See id.*

290 Grand Council of the Crees v. Fed. Energy Regulatory Comm'n, 198 F.3d 950, 952 (D.C. Cir. 2000); *see also* Monongahela Power Co., 39 FERC ¶ 61,350, 62,096 (1987) ("Congress has not granted the Commission authority to reject rate filings on environmental grounds.").

291 *Grand Council of the Crees*, 198 F.3d at 958.

Both *PSI Energy* and *Crees* involved the indirect environmental consequences of discrete actions that did not alter the social *marginal* cost of market-based actions. Therefore, those actions did not change the marginal decisions, such as when a generator should be dispatched in the auction, that directly affect market rates. Such indirect environmental consequences would be best examined through a cost-benefit analysis or National Environmental Policy Act (NEPA) analysis, not through rates. FERC has experience dealing with environmental consequences under NEPA. For example, in approving a natural gas pipeline project, FERC ordered the owner to minimize the adverse impact of the project on the surrounding community,[292] using an economic test to determine that the benefits outweighed any remaining "residual adverse effects."[293] Analysis under NEPA is a sufficient tool for such indirect environmental considerations that do not affect the social marginal cost of market transactions.

In contrast to the indirect environmental issues at issue in *PSI Energy* and *Crees*, the market failure caused by CO_2 emissions is directly related to the market transaction. It is directly related to the efficient price that suppliers should receive for producing electricity and to the "costs actually caused by the customer who must pay them."[294] And from an economic perspective, any effort to harness markets in order to ensure just and reasonable rates is incomplete without addressing this market failure.[295] Indeed, barring FERC from regulating those externalities perpetuates an inefficiency and "would subvert the FPA."[296]

There are, of course, important limitations on FERC's authority to price carbon in wholesale markets.[297] But the underlying principle—that the external cost of carbon pollution is a market failure like any other and that FERC should correct it in order to ensure efficient markets—should form the starting point

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292 *See* Columbia Gas Transmission, LLC, 158 FERC ¶ 61,046, ¶¶ 23–24 (2017).

293 *Id.* ¶ 24.

294 Ill. Commerce Comm'n v. Fed. Energy Regulatory Comm'n, 576 F.3d 470, 476 (2009).

295 *See, e.g.*, Eisen, *supra* note 30, at 1788.

296 Fed. Energy Regulatory Comm'n v. Elec. Power Supply Ass'n, 136 S. Ct. 760, 780 (2016).

297 *See infra* Part IV.

of any effort to understand FERC's authority to address the external costs of carbon pollution.

IV. THE LIMITS ON FERC'S AUTHORITY TO ADDRESS EXTERNALITIES RELATED TO CARBON DIOXIDE EMISSIONS

FERC's authority to address CO_2 emissions is not without bounds, just as its authority to address any other market failure is not without bounds. States have longstanding authority over their generation mix and FERC can neither directly intrude on that authority[298] nor haphazardly impose or approve a carbon price without evidentiary support.[299] Furthermore, the eventual rate must be just and reasonable and not unduly discriminatory or preferential. Each of these issues is addressed in turn below.

A. *Areas of Traditional State Control*

The FPA grants FERC authority only over wholesale sales, "and thereby maintains a zone of exclusive state jurisdiction."[300] FERC's jurisdiction under the FPA is limited to facilities used for the transmission and wholesale sale of electric energy. Thus, FERC does "not have jurisdiction . . . over facilities used in local distribution."[301] Instead, states have "traditional authority over the need for additional generating capacity, the type of generating facilities to be licensed, land use, ratemaking, and the like;"[302] the

298 *See* Pac. Gas & Elec. Co. v. State Energy Res. Conservation & Dev. Comm'n, 461 U.S. 190, 212 (1983).

299 *See* S.C. Pub. Serv. Auth. v. Fed. Energy Regulatory Comm'n, 762 F.3d 41, 54 (D.C. Cir. 2014) (quoting 16 U.S.C. § 824e(a)).

300 *Elec. Power Supply Ass'n*, 136 S. Ct. at 767.

301 16 U.S.C. § 824(b)(1) (2012). Similarly, FERC's jurisdiction over electric reliability is limited to the "bulk-power system" which explicitly excludes "facilities used in the local distribution of electric energy." § 824o.

302 *Pac. Gas & Elec. Co.*, 461 U.S. at 212; *see also* Entergy Nuclear Vt. Yankee, LLC v. Shumlin, 733 F.3d 393, 417 (2d Cir. 2013) (traditional state authority includes the ability to "direct the planning and resource decisions of utilities"); Conn. Dep't of Pub. Util. Control v. Fed. Energy Regulatory Comm'n, 569 F.3d 477, 481 (D.C. Cir. 2009) (states have authority over existing generators); S. Cal. Edison Co., 71 FERC ¶ 61,269, 62,076 (1995) (states can "diversify, their generation mix to meet environmental goals"); *In re* S. Cal. Edison Co., 70 FERC ¶ 61,215, 61,676 (1995) (states may "favor particular generation technologies over others"); Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Services by Public Utilities, 61 Fed. Reg. 21,540, 21,626 (1996) (noting "state authority in such traditional areas as the authority over local service issues, including reliability of

FPA preserved that authority.[303] In fact, state regulation of utilities is one of the most important functions reserved to the states.[304] States may "order utilities to build renewable generators themselves, or . . . order utilities to purchase renewable generation."[305] And FERC cannot supersede a state's historic power over that area of traditional state concern, without a clear statement from Congress.[306]

As a result, any federal agency decision to either approve a carbon pricing plan submitted by an ISO/RTO or directly impose a carbon price would need to tread carefully so as not to intrude on an area of traditional state control. But when FERC is acting within its authority to regulate a practice directly affecting rates, its actions may very well indirectly affect state priorities. In the case of carbon pricing, if FERC acts within its authority to regulate wholesale rates and corrects a market failure that directly affects rates, the fact that a carbon price might affect state programs would not invalidate FERC's action.[307] States would retain the authority to "develop whatever capacity resources they wish,"[308] and any incidental effect that those resources might have on wholesale markets is permissible under the FPA.[309] But it would remain within FERC's authority to consider whether to adjust market rules in response, in order to ensure just and reasonable rates and prevent undue discrimination.[310]

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local service; administration of integrated resource planning and utility buy-side and demand-side decisions, including [demand-side management]; authority over utility generation and resource portfolios; and authority to impose non-bypassable distribution or retail stranded cost charges").

303 *See generally* 16 U.S.C. § 824(b).

304 *See* Allco Fin. Ltd. v. Klee, 861 F.3d 82, 101 (2d Cir. 2017).

305 *Id.*

306 *See e.g.*, New York v. Fed. Energy Regulatory Comm'n, 535 U.S. 1, 18 (2002); *see also* Bond v. United States, 134 S. Ct. 2077, 2089 (2014) (explaining that the Court avoids interpreting a statute so as to "dramatically intrude" on the State's traditional criminal jurisdiction without a clear statement).

307 *See* Fed. Energy Regulatory Comm'n v. Elec. Power Supply Ass'n, 136 S. Ct. 760, 776 (2016); *see also* Eisen, *supra* note 30, at 1839, 1844 (explaining that *Elec. Power Supply Ass'n*, 136 S. Ct. at 760, demonstrates that FERC can regulate reliability "even if that impacts the states").

308 N. J. Bd. Of Pub. Utilities v. Fed. Energy Regulatory Comm'n, 744 F.3d 74, 98 (3d Cir. 2014).

309 *See* Coalition for Competitive Elec., Dynergy Inc. v. Zibelman, 906 F.3d 41, 57 (2d Cir. 2018).

310 *See* Elec. Power Supply Ass'n v. Star, 904 F.3d 518, 524 (7th Cir. 2018) (explaining that the dual federal-state system allows states to set policies and

This thinking is analogous to EPA's actions in issuing the Clean Power Plan (CPP), an environmental regulation aimed at restricting CO_2 pollution from existing power plants.[311] The CPP, which is now being repealed,[312] imposed national guidelines restricting CO_2 emissions. Those guidelines may affect state decisions regarding their generation mix, just like a carbon price. But because EPA was acting within its statutory authority in issuing a pollution guideline, any impact on the states was permissible.[313] The fact that the FPA explicitly preserved state authority over retail rates[314] does not make it more difficult to overcome this hurdle in the context of a carbon price than it does for EPA acting under the Clean Air Act. Under either statute, states have traditional authority over their generation mix, and any effort to explicitly and directly interfere with that authority would require a clear statement from Congress. But if FERC were to set a carbon price in order to correct a market failure or approve a wholesale market operator's carbon pricing plan, that would be within FERC's statutory authority, and there would be a strong argument that it has not invaded a traditional area of state control.[315]

If FERC or an ISO/RTO were to incorporate a price for CO_2 emissions in the wholesale markets, states would likely seek to adjust to that wholesale carbon price in order to avoid double counting. For example, New York State has created a program to compensate nuclear generators for the value of zero-emission generation.[316] But as the state explained in creating the program, if NYISO, the state's wholesale market operator, "internalizes the value of the zero-emissions attributes in a manner that adequately

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FERC to determine what changes, if any, to make in response when regulating wholesale markets).

311 *See* Carbon Pollution Emission Guidelines for Existing Stationary Sources, 80 Fed. Reg. 64,662, 64,666 (2015) (to be codified at 40 C.F.R. pt. 60).

312 *See* Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 82 Fed. Reg. 48,035, 48,037–38 (proposed Oct. 16, 2017).

313 *See* Respondent EPA's Final Brief at 101–06, West Virginia v. EPA, No. 15-1363 (D.C. Cir. Apr. 22, 2016), https://www.edf.org/sites/default/files/content/epa_final.pdf.

314 *See* 16 U.S.C. § 824(b).

315 *But see infra* Parts IV.B, C.

316 *See generally* Order Adopting a Clean Energy Standard at 19, N.Y. PUB. SERV. COMM'N (Aug. 1, 2016), http://on.ny.gov/2aKtpgA.

replicates the economics of the program," the state may discontinue the payments.[317]

There are three important limits on FERC's authority to regulate states. First, if FERC sets a price on CO_2 emissions in order to directly undermine state programs that promote certain generation types—by, for instance, setting a price of carbon at a rate lower than the economically efficient level with the goal of replacing state renewable portfolio standards[318]—it could face significant challenges asserting that it has exceeded its authority.

Second, carbon pricing would not eliminate or "water down" any other non-carbon-related policies that states have.[319] State renewable portfolio standards have a number of goals in mind, including a diverse and reliable generation mix, price stability, economic benefits, improved local air quality, and reductions in CO_2 emissions.[320] Though states may decide that the carbon pricing scheme replicates some of their goals, a carbon pricing scheme should not replace or supplant states' efforts to pursue other goals. As long as states do not attempt to directly supplant wholesale rates, states remain free to pursue policies that may affect rates.[321]

Third, a carbon price would not address other potential external costs of producing electricity, such as the costs imposed by other emissions such as sulfur dioxide, nitrous oxide, and other pollutants. Because any *carbon* pricing scheme could, by

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317 *Id*. at 144.

318 See *infra* Part IV.B (describing the evidentiary support that FERC would need when choosing the carbon price).

319 *See* Welton, *supra* note 3, at 1074, 1115 (arguing that state preferences for particular types of clean energy, particular locations or scales, or broad-based inclusion or redistribution" could be watered down if decarbonization happens at the federal wholesale level).

320 *See* BARRY G. RABE, RACE TO THE TOP: THE EXPANDING ROLE OF U.S. STATE RENEWABLE PORTFOLIO STANDARDS, PEW CTR. ON GLOB. CLIMATE CHANGE 6–8 (June 2006), https://www.c2es.org/site/assets/uploads/2006/05/race-top-expanding-role-us-state-renewable-portfolio-standards.pdf; *see also* Allco Fin. Ltd. v. Klee, 861 F.3d 82, 106 (2d Cir. 2017) ("Connecticut's RPS program serves its legitimate interest in promoting increased production of renewable power generation in the region, thereby protecting its citizens' health, safety, and reliable access to power.").

321 *See* Coalition for Competitive Elec., Dynergy Inc. v. Zibelman, 906 F.3d 41, 53–54 (2d Cir. 2018).

definition, only set a price for CO_2 emissions, states would be free to implement policies that set prices for other values.[322]

B. *FERC's Decisions Must Be Based on Substantial Evidence*

A second important consideration is the evidentiary support needed to implement any carbon charge. In order to require public utilities—including ISOs/RTOs—to implement tariff changes like this, FERC must justify its findings with a record supported by substantial evidence.[323] If FERC's judgment is not based on empirical evidence, it must be based, at least, on "reasonable economic propositions."[324] That is, FERC must "specify the evidence on which it relied" and "explain how that evidence supports the conclusion it reached."[325]

Under these principles, as FERC's authority is based on its role in promoting economic efficiency, its solutions to internalize this externality have to be grounded in economic theory. Prescriptions to internalize externalities are well-defined in economic theory. The best economic solution to internalizing an externality is to charge emitters a price based on the external cost emissions imposed on society. But FERC cannot impose just any price. A FERC-imposed carbon price has to be based on sound economic and scientific estimates of the external damages caused by CO_2 emissions.

Currently, the Interagency Working Group's Social Cost of Carbon represents the best estimate for the external damages of CO_2 emissions.[326] That estimate is based on the three most cited,

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322 That said, if FERC or ISOs decided to internalize the external cost of other pollutants that result directly from electricity generation, the principles discussed in this Article would apply to that decision, too.

323 *See* S.C. Pub. Serv. Auth. v. Fed. Energy Regulatory Comm'n, 762 F.3d 41, 65 (D.C. Cir. 2014).

324 *Id.*

325 *Id.* at 54.

326 The National Academy of Sciences has recommended several improvements to the Interagency Working Group's methodology. *See* NAT'L ACAD. OF SCI., VALUING CLIMATE DAMAGES: UPDATING ESTIMATION OF THE SOCIAL COST OF CARBON DIOXIDE 3 (2017), https://www.nap.edu/read/24651/chapter/1; NAT'L ACAD. OF SCI., ASSESSMENT OF APPROACHES TO UPDATING THE SOCIAL COST OF CARBON: PHASE 1 REPORT ON A NEAR-TERM UPDATE 1 (2016), https://www.nap.edu/read/21898/chapter/1. In response to those recommendations, Resources for the Future and the Climate Impact Lab are working on the next update. *See RFF's Social Cost of Carbon Initiative*, RES. FOR THE FUTURE, http://www.rff.org/research/collection/rffs-social-cost-carbon-

peer-reviewed models built to link external damages to each additional ton of CO_2 emissions.[327] To develop the estimate, the Interagency Working Group ran the three models using inputs and assumptions drawn from the peer-reviewed literature to reflect the latest and best scientific and economic data.[328] The estimate has been repeatedly endorsed by reviewers. In 2014, the U.S. Government Accountability Office reviewed the Interagency Working Group's methodology and concluded that it had followed a "consensus-based" approach, relied on peer-reviewed academic literature, disclosed relevant limitations, and adequately planned to incorporate new information through public comments and updated research.[329] In 2016, the U.S. Court of Appeals for the Seventh Circuit held that relying on the Interagency Working Group's estimate was reasonable.[330] And though the Trump Administration recently withdrew the Interagency Working Group's technical support documents,[331] experts continue to recommend that agencies rely on the Interagency Working Group's Social Cost of Carbon estimate as the best available estimate for the external cost of greenhouse gases.[332]

In fact, in many cases, agencies are still required to conduct cost-benefit analyses and calculate the monetary impact of greenhouse gas emissions.[333] And agencies have continued to use

initiative (last visited Sept. 14, 2018); *Social Cost of Carbon*, CLIMATE IMPACT LAB, http://www.climateprospectus.org/research-area/social-cost/ (last visited Sept. 14, 2018).

327 The models are DICE (the Dynamic Integrated Model of Climate and the Economy), FUND (the Climate Framework for Uncertainty, Negotiation, and Distribution), and PAGE (Policy Analysis of the Greenhouse Effect).

328 *See* TECHNICAL SUPPORT DOCUMENT, *supra* note 26.

329 *See* GOV'T ACCOUNTABILITY OFFICE, REGULATORY IMPACT ANALYSIS: DEVELOPMENT OF SOCIAL COST OF CARBON ESTIMATES 12–19 (2014), https://www.gao.gov/products/GAO-14-663.

330 *See* Zero Zone, Inc. v. U.S. Dep't of Energy, 832 F.3d 654, 677–79 (7th Cir. 2016); *see also* Peter Howard & Jason Schwartz, *Think Global: International Reciprocity as Justification for a Global Social Cost of Carbon*, 42 COLUM. J. ENVTL. L. 203 (2017) (describing the economic and policy justifications for using the Interagency Working Group's Social Cost of Carbon estimate).

331 Exec. Order No. 13,783, 82 Fed. Reg. 16,093, 16,095–96 (Mar. 31, 2017).

332 *See* Richard Revesz et al., *Best Cost Estimate of Greenhouse Gases*, 357 SCI. 655 (2017).

333 For example, the U.S. Court of Appeals for the Ninth Circuit faulted the National Highway Traffic Safety Administration (NHTSA) for ignoring the costs of greenhouse gas emissions. *See* Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin., 538 F.3d 1172, 1192 (9th Cir. 2008). The court explained

the estimates from the Interagency Working Group's documents to calculate the damages associated with additional greenhouse gas emissions.[334] With that evidence, FERC or an ISO/RTO would be able to make the required showing that carbon pricing based on the Interagency Working Group's Social Cost of Carbon is supported by substantial evidence.

Conversely, if FERC does not adhere to sound economic principles it risks a court loss. For example, in *Tejas Power Corp. v. FERC*, the U.S. Court of Appeals for the D.C. Circuit overturned FERC's approval of a settlement because FERC assumed, without analysis, that the settlement would "inure to the benefit of consumers."[335] The court held that FERC did not justify an approval of the settlement, because it failed to show the market was so structured as to have "adequate incentives to keep costs down."[336] In other words, FERC failed to adequately address the market failures related to market power and asymmetric information.

FERC's recent decision on resilience is an additional illustration of a charge that did not have sufficient evidentiary support. In October 2017, the Department of Energy proposed a rule for final action by FERC, which would have compensated generators for "resiliency" if they kept ninety days of fuel on site.[337] But as FERC found, there was no evidence to support a finding that existing rates are unjust and unreasonable due to a

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that NHTSA's decision was arbitrary and capricious because, "while the record shows that there is a range of values, the value of carbon emissions reduction is certainly not zero." *Id.* at 1200; *see also* Mont. Envtl. Info. Ctr. v. U.S. Office of Surface Mining, 274 F. Supp. 3d 1074, 1098–99 (D. Mont. 2017) (finding that it was arbitrary and capricious to quantify the benefits but not the greenhouse gas-costs of lease modifications); High Country Conservation Advocates v. U.S. Forest Serv., 52 F. Supp. 3d 1174, 1191 (D. Colo. 2014) (same).

334 *See, e.g.*, U.S. DEP'T OF THE INTERIOR, BUREAU OF OCEAN ENERGY MGMT., DRAFT ENVIRONMENTAL IMPACT STATEMENT: LIBERTY DEVELOPMENT PROJECT 3-129, 4-246 (2017) (using the Social Cost of Carbon to assess the consequences of offshore oil and gas drilling), https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=236901; Energy Conservation Standards for Walk-In Cooler and Freezer Refrigeration Systems, 82 Fed. Reg. 31,808, 31,811, 31,853–58 (2017) (using the Social Cost of Carbon and Methane to assess an energy efficiency regulation).

335 Tejas Power Corp. v. Fed. Energy Reg. Comm'n, 908 F.2d 998, 1003 (D.C. Cir. 1990).

336 *Id.* at 1006.

337 *See* Grid Resiliency Pricing Rule, 82 Fed. Reg. 46,940 (proposed Oct. 10, 2017) (to be codified at 18 C.F.R. pt. 35).

failure to compensate generators for grid resilience.[338] In imposing a carbon price, FERC would need to heed the principles laid out in these cases.

C. *Any Resulting Rates Must Be Just and Reasonable*

Another crucial limit is that, regardless of whether FERC is acting pursuant to sections 205 and 206, its actions must result in just and reasonable rates. Under section 205, when a utility or ISO/RTO submits a tariff for approval, FERC has authority to conduct "an inquiry into whether the rates proposed by a utility are reasonable."[339] FERC does not have to conclude that current rates are unjust and unreasonable to approve a section 205 tariff filing,[340] but it must find that the proposed rates are just and reasonable.[341] And under section 206, after finding that current rates are unjust and unreasonable, FERC must "demonstrate through substantial evidence that the new rate is just, reasonable and not unduly discriminatory."[342]

In conducting this analysis, FERC would need to look at factors such as whether the additional charge is reasonable and whether it properly balances customer and generator interests. Benefits of a wholesale price on carbon could include "harmonizing fragmented implementation" of renewable mandates and diversifying supply.[343] But there should be no room to dispute

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338 *See* Grid Reliability & Resilience Pricing, 162 FERC ¶ 61,012, ¶ 15 (2018).

339 City of Bethany v. Fed. Energy Regulatory Comm'n, 727 F.2d 1131, 1136 (1984); *accord* Cal. Indep. Sys. Operator Corp., 141 FERC ¶ 61,237, ¶ 23 (2012).

340 *See* City of Winnfield v. Fed. Energy Regulatory Comm'n, 744 F.2d 871, 875 (D.C. Cir. 1984).

341 *See supra* Part I.A.

342 Ameren Servs. Co. v. Midwest Indep. Transmission Sys. Operator, Inc., 121 FERC ¶ 61,205, ¶ 32 (2007); *see also City of Bethany*, 727 F.2d at 1136; Cal. Indep. Sys. Operator Corp., 141 FERC ¶ 61,237, ¶ 30 (2012).

343 Peskoe, *supra* note 34, at 14; *see also* ISO New England Inc., 158 FERC ¶ 61,138, ¶ 9 (2017) (finding that ISO-NE's plan to exempt new renewable generators that had received states subsidies from the minimum offer price rule was reasonable because it ensured that customers would not have "to pay for capacity twice—first, for renewable resources via out-of-market" state-mandated payments and second for capacity on the capacity market even though no additional capacity was needed); Bateman & Tripp, *supra* note 36, at 313 (FERC could play a useful role in reducing inefficiencies in scattershot state-federal regulation of greenhouse gases).

that the FPA allows ISO/RTOs to include the feature in their proposals.

For example, under section 205, FERC has approved several proposals to consider the costs of compliance with state-level programs designed to promote renewable generation. FERC approved CAISO's decision to implement tariff changes that accommodated California's greenhouse gas cap-and-trade program.[344] CAISO's changes allowed generators to include the costs of complying with California's cap-and-trade program in their bids into the energy market.[345] FERC also approved ISO-NE's tariff changes, adopted to take into account generators' increased costs of complying with Regional Greenhouse Gas Initiative (RGGI), a multi-state CO_2 emissions cap-and-trade program. RGGI requires generators to purchase allowances for each ton of emitted CO_2. In this way, RGGI "causes high-emitting generators to incur higher costs, which are then factored into their market offers" in the wholesale electricity market.[346] FERC approved the request of National Grid Generation (NGG) to include in its bid the cost of allowances it had to purchase to operate within a RGGI jurisdiction.[347] Similarly, in PJM, "[c]osts for environmental controls are part of bids for capacity resources in the PJM Capacity Market" and are "included in energy offers."[348]

When compliance costs are factored into a generator's bid in this way, the auction is able to take that cost of compliance into account: factoring it into bids shifts the supply curve up, increasing the ultimate price chosen in an auction. And for certain generators, including that cost in bids will put them out of the running, because their price will be too high. In this way, the auctions have begun to take the external costs of CO_2 emissions into account—to the extent that the compliance costs for these programs are related to those external costs.[349] And FERC has deemed the resulting

344 *See* CAL. CODE REGS. tit. 17, §§ 95810–11 (2014).

345 *See* Cal. Indep. Sys. Operator Corp., 153 FERC 61,087, ¶ 57 (2015).

346 ISO NEW ENGLAND, 2016 REGIONAL ELECTRICITY OUTLOOK 29 (2016), https://www.iso-ne.com/static-assets/documents/2016/03/2016_reo.pdf.

347 *See* Nat'l Grid Generation, LLC, 143 FERC ¶ 61,163, ¶¶ 5, 12 (2013).

348 MONITORING ANALYTICS, LLC, STATE OF THE MARKET REPORT FOR PJM 275, 278 (2016), http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2015/2015-som-pjm-volume2-sec8.pdf.

349 Note that the compliance costs related to cap-and-trade programs such as RGGI are significantly lower than the Social Cost of Carbon, which is an

rates just and reasonable. As this Article has shown, fully internalizing the external cost of CO_2 emissions is a reasonable extension of these efforts to promote an efficient marketplace and would fall comfortably within FERC's authority over practices directly affecting rates.

CONCLUSION

FERC has long sought to regulate the market for energy by promoting efficiency. In pursuit of an efficient market, FERC has regulated market power, asymmetric information, public goods, and certain externalities. CO_2 emissions are just another externality. Unless the cost of the emissions is internalized by the generators that produce those emissions, the market outcomes will be inefficient and will not maximize social welfare. By failing to address this problem, FERC falls short of satisfying its mandate to ensure just and reasonable rates.

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estimate of the external damage values. For example, the RGGI auction price was $4.02 in June 2018, only a small fraction of the full external damages calculated by the Social Cost of Carbon. *Compare* TECHNICAL SUPPORT DOCUMENT, *supra* note 26, at 16, *with* REGIONAL GREENHOUSE GAS INITIATIVE, ALLOWANCE PRICES AND VOLUMES, https://www.rggi.org/auctions/auction-results/prices-volumes (last visited Aug. 20, 2018).